



THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN UROLOGICAL ASSOCIATION

An Overview of Practicing Urology in Libya

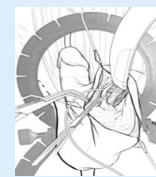
Refaat Abusamra, MD
Muna M. Abusanuga, MD



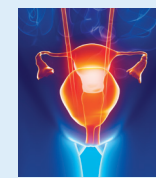
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An Overview of Practicing Urology in Libya

Refaat Abusamra, MD

National Cancer Institute, Misurata University,
Libya

Muna M. Abusanuga, MD

National Cancer Institute, Misurata, Libya

Over the last few decades, the Libyan medical colleges grew from 2 colleges in the largest cities in the public sector to 15 colleges across the country. After graduation, medical residents should continue doctoral studies locally as urologists at the Libyan Board for Medical Specialties and/or Arab Board of Medical Specialties. According to the Libyan Board for Medical Specialties, there were 33 newly certified urologists between 1995 and 2017. In total, there are about 140 Libyan urologists (consultants, specialists, and residents). Some Libyan urologists are members of urological societies like the AUA, the European Association of Urology, and the Société Internationale d'Urologie.

With continual training on new procedures and the availability of new technology in the country, urology practice has dramatically improved in the last years. We are

“In total, there are about 140 Libyan urologists (consultants, specialists, and residents). Some Libyan urologists are members of urological societies like the AUA, the European Association of Urology, and the Société Internationale d'Urologie.”

doing most of the open urological surgeries, all endourological surgeries, and some laparoscopic surgery.

Here, we will give a brief overview about the National Cancer Institute (NCI) Misurata as an example from Libya, which belongs to the public health sector of the Libyan ministry and is titled as a highly specialized cancer care center, and is located in the third largest city of Libya, which is Misurata. It was established on September 19, 2004, and provides its services free of charge for about 21% of the Libyan population, those located in the midland region of the country (Figure 1). Still, the NCI Misurata offers its daily services for outpatients and inpatients from all over the country, and especially cancer patients through 350 clinical beds, which are distributed within 23 medical and administrative departments, and there are 897 staff members, including medical and nonmedical employees.

NCI Misurata is an academic university hospital and a training center for undergraduate and postgraduate doctors, and is an official training and examining center for the Libyan Board and Arab Board of Urology.

The diagnostic services of NCI Misurata include a fully equipped laboratory that contains a hematology



Figure 1. National Cancer Institute Misurata, Libya.

unit, biochemistry unit, microbiology unit, and blood bank units. Also, there is a highly equipped histopathology department. In addition, there is a nicely equipped radiology department, consisting of an ultrasound unit, conventional radiology unit, CT scan, and multiparametric MRI for diagnosis and taking biopsies, while the therapeutic services of NCI Misurata are offered by the medical oncology department and radiotherapy department. It is also an intensive care unit for critically ill medical and surgical patients and for some

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Figure 2. Performing percutaneous nephrolithotomy.

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AN OVERVIEW OF PRACTICING UROLOGY IN LIBYA

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Figure 3. Weekly multidisciplinary meeting.

“NCI Misurata is an academic university hospital and a training center for undergraduate and postgraduate doctors, and is an official training and examining center for the Libyan Board and Arab Board of Urology.”

postoperative cases. For palliative and supportive care services, we

offer the pain treatment clinic, nutritional supporting unit, and many other essential medical specialties for these kinds of situations.

Regarding the urological services, our institute has a well-equipped operation theater with all needed instruments for all major open surgeries like radical nephrectomy, radical nephroureterectomy, radical prostatectomy, and radical cystectomy, besides a complete endourology unit for all procedures (transurethral resection of the prostate and transurethral resection of bladder tumor, ureteroscopy, flexible ureteroscopy, and percutaneous nephrolithotomy) and a laparoscopy unit for laparoscopic surgeries (Figure 2).

At NCI Misurata, there is a weekly multidisciplinary meeting to discuss the workup to offer a better medical management for each



Figure 4. First Libyan Multidisciplinary Conference on Urological Cancers 2022 (LMUC22), July 2022.

oncology case (Figure 3). Despite the complex situations in Libya, we are trying our best to improve our daily urological practice through continuous medical education activities like webinars and courses, and by attending international urological conferences and activities. In addition, we are following the AUA and European Association of Urology guidelines in our daily work.

Our institute has a hospital-based cancer registry that includes 11,440 newly registered cancer cases, and the urological cancer cases account for 9.3% of all cancer cases between 2004 and 2021. Additionally, the office of the midland cancer registry is located at our institute, too, which is a population-based cancer registry electronically linked to the entire national cancer registry system.

The NCI Misurata owns a big medical library unit, with some

electronically equipped lecture rooms and a large main hall that are ready for any needed activity. We are part of a lot of scientific activities, and a part of many medical and urological webinars at the national and international levels. As an example, we held a national course on percutaneous nephrolithotomy in 2014, and the 1st Libyan Multidisciplinary Conference on Urological Cancers 2022 with the collaboration of many international societies, including the AUA (Figure 4).

Finally, we belong to the Libyan Urological Association, which was founded in 1989. The Libyan Urological Association holds an annual urology conference, the most recent of which was held in Tripoli in November 2022 (Figure 5).

We are improving our urology practice to improve patient care. ■



Figure 5. Thirteenth Libyan Urology Association conference, November 2022.

AUA2023: REFLECTIONS

Semi-live Surgery Using Intrarenal Pressure Sensing Ureteroscope With Moses Pulse Modulation Laser

Naeem Bhojani, MD

University of Montreal, Quebec, Canada

Ben H. Chew, MD, MSc, FRCSC

University of British Columbia, Vancouver, Canada

Ureteroscopy has become the most common surgical modality worldwide in the treatment of kidney stones.¹ Since the introduction of the flexible ureteroscope, advancements continue to make them smaller, more maneuverable, and with better image resolution. At this year's AUA semi-live session, we endeavored to highlight a few of the recent developments that have occurred in this rapidly evolving field.

Single-use ureteroscopes (ie, "disposable" scopes) have been in wide use since 2016 when the LithoVue ureteroscope became widely available.² Since then, dozens of single-use digital ureteroscopes have emerged on the market providing excellent maneuverability and visualization rivaling that of reusable digital ureteroscopes. The next generation of LithoVue ureteroscope, named LithoVue Elite (LVE), has higher resolution due to advancements in chip technology as well as better lighting and contrast from improved LED lighting. The main new advancement in the LVE ureteroscope is that it is able to sense intrarenal pressure (IRP) in real-time intraoperatively.

A number of studies have determined that IRPs above 40 mm Hg (and even as low as 30 mm Hg) will lead to pyelovenous backflow—something theorized to increase the risk of urosepsis and pain.³ Postureteroscopy pain can occur even in the absence of intraoperative complications. Suggestions that pain is related to pressure were supported by a study by Pedersen et al, who studied 15 patients undergoing percutaneous nephrolithotomy.⁴ With the patient awake, they instilled contrast at a rate of 1 cc/sec through a 7F catheter and measured IRP via the nephrostomy tube. Using a visual analog scale they determined that the average threshold when patients experienced pain was when IRP went above ~34 mm Hg. It re-

mains to be determined if this pain occurs when a spike in IRP occurs or whether it requires a sustained duration of elevated IRP. Previously, measuring IRP during ureteroscopy was cumbersome and was first described only in patients with a preexisting nephrostomy tube.⁵ There are pressure sensing guidewires from the cardiac field that may be used in the kidney, but these require additional monitors as well as the insertion of additional equipment into the ureter.⁶

Currently, the only 2 things we have under our control that we know influence renal pressure are (1) whether a ureteral access sheath is used or not, and (2) the type of irrigation method used during ureteroscopy. With more clinical experience, we are beginning to learn that we do not know all of the factors that influence renal pressure. During this year's semi-live surgery, we demonstrated a few lessons that we have learned while using the new LVE flexible ureteroscope with pressure sensing capacity: (1) IRP is impossible to predict without measuring it. In general IRP in the renal pelvis is about 28 mm Hg during ureteroscopy but can go much higher when the ureteroscope is in tighter calyces or if irrigation pressure is increased. Additionally, IRP can increase above 100 mm Hg during simple ureteroscopy cases. (2) Anatomy, especially the ureteropelvic junction, can have

a significant impact on IRP. A tight ureteropelvic junction can significantly increase IRP—likely because the renal pelvis is less likely to empty the irrigant fluid from the ureteroscope. (3) IRP can be manipulated higher or lower if necessary. For a patient at risk of sepsis from ureteroscopy, IRP can be reduced by using a manual syringe for irrigation and aspirating fluid as necessary during the case to maintain pressure below the pyelovenous backflow threshold. In addition, if the IRP can be continuously monitored, pressure irrigant can be increased when necessary to maximize visualization. The caveat to this is that you need to know what the IRP is in real time as you are operating.

The other part of the semi-live surgery involved the use of the P120 laser with Moses technology (see Figure). With this new technology, the traditional holmium (Ho):YAG laser is improved by modulating the laser pulse to an initial small vapor bubble that separates the water directly in front of it (the Moses effect), and the second part of the pulse is transmitted through the vapor bubble toward the stone. This improves the efficiency of energy transmission toward the stone and reduces retropulsion.

By decreasing retropulsion, this allows more direct contact time with the stone from the laser, thus potentially shortening operative

times and decreasing surgeon frustration. Faster stone ablation rates using Moses have been shown compared to regular Ho:YAG.⁷ When using this technology for holmium enucleation of the prostate, Moses technology has shown improved hemostasis and shorter operative times.⁸ The Moses technology and other new high-powered laser technologies have swayed many more procedures toward the dusting technique given the finer dust and decreased retropulsion compared to the traditional Ho:YAG lithotripsy.⁹

It is clear from the early work demonstrated in this semi-live surgery that a number of questions need to be answered regarding IRP. Is there a safe IRP? At what IRP do complications occur? Is there one maximum threshold pressure that, when exceeded, opens a floodgate for a complication to occur, or is it based on an average pressure over a minimum time period? Are patient factors important, and what are their implications and relationship with IRP? Fortunately, with this new flexible ureteroscope with pressure sensing capacity, IRP can be measured in every case and we can begin to answer some of these questions. Currently, we have an ongoing study to evaluate and correlate patient pain and infection postureteroscopy to see

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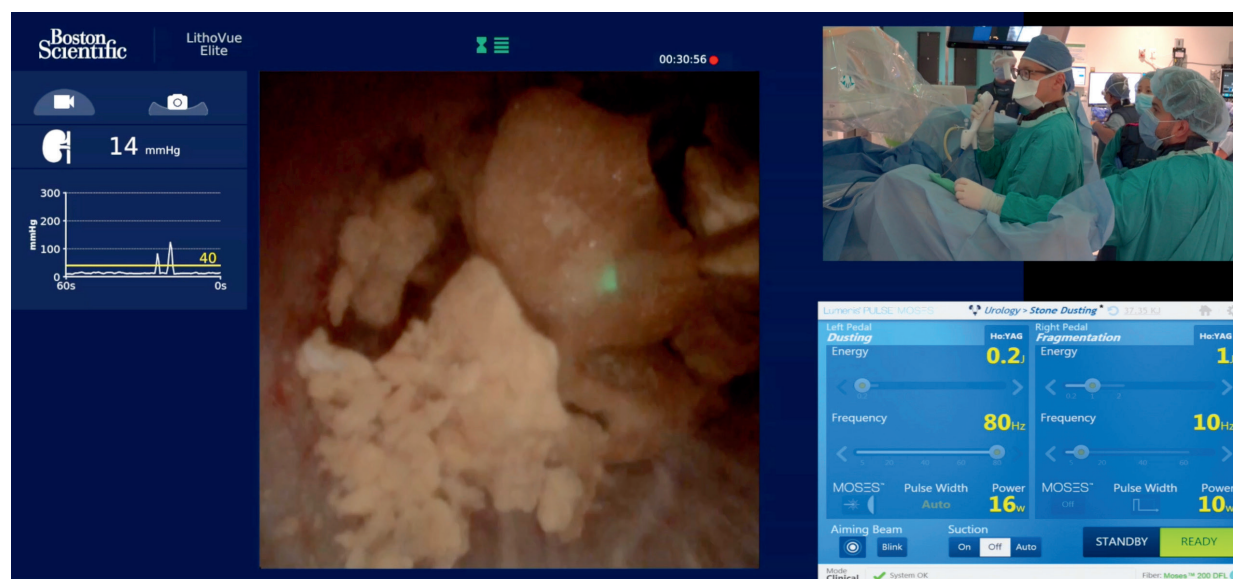


Figure. Semi-live surgery utilizing LithoVue Elite pressure sensing ureteroscope and holmium:YAG Moses laser.

SEMI-LIVE SURGERY USING INTRARENAL PRESSURE

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what role IRP plays in this. Moses laser technology reduces retropulsion and operative time, and future comparative studies will help determine in which circumstances and which conditions each laser is best suited. These new tools will hopefully allow urologists to improve their treatment of kidney stones. ■

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AUA2023: REFLECTIONS

AUA Launches Successful Global Residents Leadership Retreat at AUA2023

John Denstedt, MD, FRCSC, FACS, FCAHS

Immediate Past Secretary, AUA

For more than a century, the AUA has been committed to providing clinical education for the urological community. In the past several years, the AUA recognized an emerging need for leadership and business training among urologists—at all stages of their career. To meet this need, the AUA officially launched its Institute for Leadership & Business (ILB) in 2022 with the goal of providing education, training and resources that support leadership development and business acumen within the urology community. One of the first programs launched under the ILB was the Global Residents Leadership Retreat, which took place on Thursday, April 27, 2023, at the AUA Annual Meeting in Chicago. The AUA prides itself on being a global leader in urology and with global outreach and education steadfast priorities of the organization, it's no surprise the AUA took a global approach when developing its first leadership program for residents. The Retreat's mission was to provide leadership development training for residents, but the AUA also wanted to create an opportunity for residents around the world to forge strong connections that would carry forward well beyond their time in Chicago.

To assemble an engaged group of residents from around the world, the AUA partnered with its 8 do-

mestic Sections, which selected half of the participants, and our international partner societies from the AUA International Membership Committee (IMC) selected the other half. In total, the Retreat included 38 residents representing all AUA Sections (including Canada and Mexico) as well as Argentina, Australia, Brazil, Chile, Colombia, Denmark, Dominican Republic, Egypt, Germany, India, Israel, Italy, Japan, Korea, Peru, Spain, Taiwan, and the United Kingdom. Though the attendees were geographically diverse, the program was designed to be universal and spoke to the core fundamentals of leadership, which transcends geographic borders. Sessions explored the role of a strong leader and effective communication skills. Participants also participated in a DISC Assessment, which allowed them to understand their own personality type and how to adapt and work with other personality types. Navigating challenging and changing environments are critical for today's leaders, so we included a session on leadership agility and how to assess and manage uncertainty.

One of the most unique features of the program was its highly interactive format. Dana Hamer, AUA's Director of Marketing & Member Engagement, noted, "We were very intentional about building a program that got participants out of their seats and engaged with one another. We know there is value in the didactic content, but there is

often greater value in the connections." The day's most interactive, and highly praised, program was the Journey for Jewels Simulation, a swashbuckling strategy session where participants worked in teams to successfully navigate an ocean, mine diamonds, and return home, all while facing time constraints, challenges, and unexpected changes—some of the very pressures facing today's leaders.

The day came to a close with Drs Margaret Pearle, Brant Thrasher, and Stephen Nakada, all established leaders in urology, joining me for a panel discussion on leadership. Margaret Pearle, Professor and Vice Chair of Academic Affairs and Past-president of the Endourological Society, explored the differences between mentorship and sponsorship, and encouraged residents to invest in relationships and take on challenging tasks. Brant Thrasher, Executive Director of the American Board of Urology, spoke passionately on exemplifying leadership, reminding residents that "leadership is character in action." Stephen Nakada, Urology Chairman at University of Wisconsin and now AUA President-elect, spoke on learning to lead boldly, inspiring residents to be consistent, productive, and relevant over time. As my tenure as AUA Secretary came to a close just a few days after this event, the panel discussion allowed me the opportunity to reflect on my decades in global leadership—the extraor-

inary relationships, the indelible opportunities, the lessons learned, and the lasting impact, both on me and the organizations I have had the privilege to serve.

We surveyed attendees after the program, and the event received universal praise. One hundred percent of respondents said the retreat enhanced their understanding of leadership. One hundred percent of respondents said the retreat helped them to develop their own personal leadership skills. One hundred percent of respondents said they would recommend the program to other residents. Nine out of 10 respondents said that they anticipate using the skills and concepts they learned often or every day. The one change they recommended was more time to connect. They were having such a good time, several recommended we extend the program with an organized happy hour. We'll be sure to make note of that for the next Global Residents Leadership Retreat in 2025.

We were inspired by the extraordinary group of residents who joined us for our inaugural event—the future of our specialty looks very bright indeed! We hope the connections they made will endure and spark future collaborations all around the world. When I think back on the day in its entirety, it started in a quiet room, many residents shy, cautious, and curious about the day ahead. The day ended in a room filled with energy, laughter, and camaraderie. Mission accomplished. ■

AUA2023: REFLECTIONS

Work Smarter, Not Harder: Optimizing Clinical Efficiency

Sarah Hecht, MD

Doernbecher Children's Hospital, Oregon Health & Science University, Portland

Kyle Rove, MD

Children's Hospital Colorado, University of Colorado Anschutz Medical Campus, Aurora

McCabe Kenny, MD

Urology Center of Iowa, Des Moines

Jyoti Chouhan, DO, PharmD, FACS

Oregon Health & Science University, Portland

What happened to medicine? Regulatory requirements and increasing administrative burdens are often blamed for generating meaningless extraneous work aptly deemed “stupid stuff.”¹ While our professional organizations work to advocate for those of us in the trenches, how can we work within the current system to recapture joy in work? One approach is to improve clinic efficiency. Principles include: (1) elimination (identify and get rid of “stupid stuff”), (2) delegation (each team member should function at the top of their license), (3) automation of repeatable work, and (4) don't reinvent the wheel. The question, of course, is how?

Where to Start: Growth Mindset and Cognitive Hacks

Surgeons are particularly skilled at task completion. For many of us, this morphs into a status symbol where “busy” becomes a proxy for “hard-working,” and busyness is socially lauded.² Being busy, task-oriented, and deferent to tradition makes us particularly vulnerable to the status quo bias, or a preference for doing things the way they have always been done.

First, let us recognize that nothing changes if nothing changes. We need to challenge our behavioral inertia. Better yet, mimic colleagues who have already discovered a better way. For the efficiency superstars among us, publish your successes!³ Secondly, we must admit that cognitive energy is a finite resource. Inundation with low-level tasks and questions leads to decision fatigue, a well-documented phenomenon.⁴ Lastly, the myth of multitasking has long been scientifi-

cally busted. When we believe we are multitasking, our brains are in fact rapidly task switching. Unfortunately there is a cost for every switch in attention, which makes multitasking cognitively inefficient.⁵ Monotasking, or task-batching (performing cognitively similar tasks together), is the ideal. Examples include clustering visit types (eg “vasectomy Fridays”) and avoiding interruptions such as email and phone notifications.

Harness the Electronic Medical Record

The electronic medical record (EMR) is a key driver of increased physician administrative burden and professional dissatisfaction.⁶ Optimizing one's EMR is a mundane but important task for improving clinical efficiency. Quick wins include:

- Utilizing favorites or preference lists, which are shortcuts for common orders.
- Creating order sets. Outpatient order sets are less commonly utilized than inpatient order sets, but are high yield. These bundle common diagnosis codes, orders, patient handouts, follow-up requests, and billing codes in a single easy-to-access screen which mimics the clinical workflow. With just a few clicks, all charting is done save for the note.

To learn more EMR tips (which are often EMR specific), seek and take advantage of educational modules, online shared resources, and personalized EMR training. Alternatively, identify an EMR “champion” within your practice who can do this legwork for you. Collaborate with your existing institutional support—clinical informaticists, your chief medical informatics officer, and any EMR-related committees so you can tackle problems together.

Is this all really worth it? The answer is an unambiguous yes. EMR training can vastly boost end user efficiency. One EMR optimization pilot program born of a wellness initiative at the University of California Davis led to a median reduction of 25 hours per month in time spent charting after hours.⁷

Efficient Documentation

Clinical documentation represents the most time-consuming administrative task performed by physicians.⁸ Moreover, note quality has deteriorated over time leading to increased time spent reviewing the chart. Developing well-designed, highly usable note templates is foundational to efficient documentation and minimizing chart review. Fortunately, the 2021 evaluation and management guidelines from the Centers for Medicare and Medicaid Services freed physicians to document meaningfully and concisely. Quick wins include:

- Formatting new, return, and procedure templates. Important and nonstandard information should be emphasized, eg, bolded. To ensure accuracy, avoid creating templates that default to normal findings and using copy/paste functionality. Plans should be easily located.
- Voice recognition software. This allows physicians to dictate portions of the note and is often faster than typing free text. Such software may also offer the ability to create note templates which are portable between clinics and different EMR systems, as well programmable microphones that accept voice commands.

Practice Management: Standardization, Delegation, Resource Management, and Team-building

Practice standardization is key to effective delegation, decreasing decision fatigue, and increasing quality of care. Some tenets of practice management that lead to efficiency are as follows:

- Shared documentation templates: Standardizing note templates within a practice facilitates documentation review not just for you, but for your entire team.
- Create robust protocols: Standardized, protocol-driven decision trees agreed upon by the group practice improve efficiency

by automating low-level decision-making and eliminating questions surrounding oft-repeated tasks. Examples include refills, clinical care pathways, and common results follow-up. Reaching consensus within a practice can be a challenge at first. Urological conditions with clear guideline-based care recommendations are a good place to start.

- Inbox management: Ideally, physicians are not first-line responders to the unfiltered inbox. The American Medical Association Steps Forward Curriculum has produced several tool kits focused on inbox management, including suggested delegation trees. Additional tips include scheduling protocols that ensure lab/imaging results are available for review at the time of the visit and setting boundaries around patient portal messages including limited message length.
- Resource optimization: A perfectly efficient practice has no idle time and no wasted resources. This requires an in-depth and practice-specific assessment of resources (rooms, equipment, personnel, time). The rate-limiting resource should be the focus. For instance, batching office procedures is an excellent efficiency strategy; however, in an office with limited procedure rooms, alternating procedures with consultations to allow time for room turnover is the better strategy. Hiring a practice management consultant can be a wise investment.
- Team-building and organizational culture: Perhaps most importantly, a productive organizational culture begets efficiency by bringing out the best in your team and decreasing turnover. Team huddles, clear roles, and an open-door communication policy can inspire autonomy, offloading reliance on physicians. Workflows for staff should also focus on efficiency and meaningful work. Medical assistants, for instance, may be afforded dedicated time for indirect care to avoid interruption and multitasking.

WORK SMARTER, NOT HARDER: OPTIMIZING CLINICAL EFFICIENCY

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Leveraging Technology, Current and Future

Urologists have long been on the forefront of surgical technological advancements, and increasingly technology is finding its way into our outpatient workflows. Examples of technological advancements in the clinic include:

- Creation of high-quality patient information including personal websites and custom videos for patients to access prior to their visit.

- On the administrative side, various software programs exist to automate clerical tasks including the clinic check-in process, appointment reminders, and patient surveys which get automatically uploaded to their medical record.
- For those who delegate documentation to scribes, off-site/virtual scribes became increasingly popular during the pandemic, and artificial intelligence scribes that generate documentation and orders via ambient listening technology are just around the corner.

The golden olden days of medicine are gone; however, with creative problem-solving, resource-sharing, and thinking big, our best days may still lie ahead. Stay tuned! ■

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CASE REPORT

Luschka Bile Duct Injury in Robotic Right Partial Nephrectomy: Case Report and Literature Review

Chenlin Huang, BS

Saint Louis University School of Medicine, Missouri

Leor Arbel, MD

Saint Louis University School of Medicine, Missouri

Antonio Cheesman Rocca, MD

Saint Louis University School of Medicine, Missouri

Zachary A. Hamilton, MD

Saint Louis University School of Medicine, Missouri

Sameer A. Siddiqui, MD

Saint Louis University School of Medicine, Missouri

Mohammad Mahmoud, MD, MS

Saint Louis University School of Medicine, Missouri

Introduction

Biliary complications during minimally invasive urological surgeries are rarely described in the literature. Two cases of common bile duct (CBD) injuries have been reported by Canes et al¹ and 1 case of gallbladder perforation was reported by Jaramillo et al,² with no reported cases of accessory biliary ducts injury. This report describes a case of accessory bile duct injury during adhesiolysis and liver mobilization in transperitoneal robot-assisted right partial nephrectomy and summarizes perioperative management of iatrogenic biliary injuries.

Case Description

A 72-year-old female with stage IIIb chronic kidney disease presented to the urologic oncology

clinic for evaluation of a 7.5-cm right renal mass. The mass on cross sectional imaging was partially endophytic (Figure 1). Past surgical history includes open cholecystectomy, appendectomy, and bilateral tubal ligation. Given the patient's renal insufficiency and size of the mass, a right partial nephrectomy with transperitoneal approach was recommended.

Pneumoperitoneum was achieved using a Veress needle, and one 8-mm robotic trocar was placed and used to visualize the operative field. There were extensive bowel and omental attachments to the anterior abdominal wall and adhesions on the superior and anterior liver surfaces. We proceeded to place 3 additional robotic ports and 1 laparoscopic assis-

tant port. The liver edge was found to be densely adherent to the omentum. It was superficially dissected with robotic scissors. Small amounts of green fluid were then noted in the surgical field. General surgery was consulted intraoperatively. A hepatic duct or CBD injury was unlikely due to a superficial dissection plane. No bowel injury was noted. No clear source of green discharge could be identified. It was recommended to place a drain in the right upper quadrant and observe the patient clinically. We continued to dissect the right renal hilar, and identify the renal mass borders with intraoperative renal ultrasound. The partial nephrectomy was performed with gross negative margin and excellent hemostasis after renorrhaphy.

Postoperatively, the patient was monitored for drain output, right upper quadrant pain, nausea, emesis, fever, chills, and jaundice. The patient had only occasional nausea. Hepatic function panel was normal on postoperative day (POD) 1. Drain outputs were nonbilious averaging 300-500 mL in POD1 and 2. Output became bilious with no increased volume in POD3. The drain fluid showed elevated bilirubin of 69 and normal triglyceride and creatinine. Gastroenterology was consulted for bile leak. Endoscopic retrograde cholangiopancreatography (ERCP) was performed on POD5. The cholangiogram showed an apparent bile leak despite intact CBD



Figure 1. Preoperative CT imaging showing anterolateral mass in right inferior renal pole.

→ Continued on page 8

LUSCHKA BILE DUCT INJURY IN ROBOTIC RIGHT PARTIAL NEPHRECTOMY

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Figure 2. Endoscopic retrograde cholangiopancreatography on postoperative day 5. There was extravasation of contrast from the biliary tree, but the exact location could not be well visualized.



Figure 3. Repeat endoscopic retrograde cholangiopancreatography for biliary stent removal at 3 months postoperatively showing dilated main extrahepatic bile duct with no bile leak or downstream obstruction.

Sphincterotomy was performed, and one 10F by 7-cm transpapillary stent was placed in the CBD. The patient tolerated the procedure well and was discharged on POD8. Surgical drain was left in place at discharge with continued bilious output. At the 3-week postoperative visit, the patient had no complaints. Surgical drain output was nonbilious and less than 20 cc per day, and the drain was removed in the office. The patient underwent repeat ERCP at 3 months postoperatively for stent removal, which showed dilation of the main extrahepatic bile duct with no apparent leak (Figure 3).

and hepatic biliary ducts, indicating a likely Luschka duct leak (Figure 2).



Figure 4. Algorithm for management of biliary injuries during robotic or minimally invasive urologic procedures. CT indicates computerized tomography; ERCP, endoscopic retrograde cholangiopancreatography; MRI, magnetic resonance imaging.

Discussion

Diagnosis and management of iatrogenic biliary injury are mainly described in the context of laparoscopic cholecystectomy. In urological cases, patients with previous cholecystectomy have a higher risk of iatrogenic biliary injury due to postoperative dilation of the biliary tree. Overall perioperative management of biliary injuries has been summarized in Figure 4.

For bile duct injuries that are recognized intraoperatively, it is recommended to perform a prompt cholangiography and explore the CBD. CBD injury or transection usually requires anastomosis and reconstruction by a biliary surgeon. If an insult to an accessory bile duct is visible, tying off the bile duct and placing a surgical drain will provide good control of the leak.³ If the extent of injury is small or the injury was unrecognized intraoperatively, bile leaks can be managed by placing a biliary stent during ERCP on a later date.⁴ A biliary stent facilitates the preferential flow of bile and reduces intrabiliary pressure.⁵

For gallbladder injuries, small contusions or laceration may be managed conservatively. However, cholecystectomy is the definitive procedure of choice if there is apparent leak, large laceration, or gallbladder perforation.⁶ CT imaging can be useful in identifying discontinuity of the gallbladder wall postoperatively, but it should not delay cholecystectomy if bile peritonitis is present.

Only 2 cases of bile duct injuries during minimally invasive urologic procedures have been described in literature. Canes et al reported a case of CBD injury during mobilization of the hepatic flexure while creating an Indiana pouch after radical cystectomy, and another case of CBD injury during lysis of adhesions in the undersurface of the liver in right partial nephrectomy.¹ In the first case, the injury to the CBD was able to be visually identified and repaired intraoperatively without additional interventions. In the second case, the patient required placement of a surgical drain, ERCP, and biliary stenting in addition to intraoperative CBD repair. Jaramillo et al reported a case of gallbladder perforation secondary to Veress needle placement during a robot-assisted right simple

nephrectomy.² The planned procedure was aborted due to CO₂ air embolism in the patient, and the patient developed biliary peritonitis on POD3. The patient subsequently underwent diagnostic laparoscopy and cholecystectomy.

Our patient had extensive adhesions from previous abdominal surgeries, and bile leak was observed during adhesiolysis between the liver and the omentum. Absence of a native gallbladder made it difficult to access the biliary tree and perform an intraoperative cholangiography, but no injuries to major biliary structures were visualized. In this case, injury to an accessory bile duct, such as a Luschka duct, was most likely given the location and depth of the dissection plane. The patient had an asymptomatic bile leak and remained stable. However, surgical drain placement and ERCP were clinically warranted given high output and risk of biloma formation. The patient made a full recovery with resolution of leak via ERCP with biliary stent placement.

Conclusions

This is the first case report of accessory bile duct injury during transperitoneal robot-assisted right partial nephrectomy. We emphasize the higher risk of biliary injuries in right-sided nephrectomy procedures in patients who have had cholecystectomy. When bile leak is limited in size and does not involve CBD, delayed repair with ERCP and external drainage of biliary tree in the interval is safe and effective. ■

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AUA2023: REFLECTIONS

Benign Prostatic Hyperplasia: Predicting the Future

Steven A. Kaplan, MD

Icahn School of Medicine at Mount Sinai, New York, New York

The most reliable way of predicting the future is creating it.

Abraham Lincoln

When tasked with preparing a state-of-the-art talk on benign prostatic hyperplasia (BPH) at the annual AUA meeting in Chicago, there were many directions and areas to focus on. The good news is that BPH is a very exciting arena to be in and is in its own Renaissance. Primarily driven by innovation entrepreneurs, researchers and clinicians are attempting to transform how we access patients, communicate more effectively, accurately diagnose, and precision-treat men with BPH.

Given the recent chatter about artificial intelligence (AI), what better way to predict the future of BPH than asking ChatGPT? It appears that it wasn't ready to answer this query and provided a fairly neutral response of: "As an AI language model, I do not have the ability to predict the future with certainty. However, based on historical patterns and current trends, it is possible to make informed predictions about certain events or phenomena." Therefore, to be more precise and provocative, the talk focused on (1) Artificial Intelligence, (2) Informatics, (3) Diagnostics, (4) Therapeutics, and (5) the Bottom Line (see Figure).

AI

- **Imaging:** AI can be used to analyze medical images of the prostate, such as MRI or ultrasound scans, to help diagnose BPH and assess its severity.
- **Predictive analytics:** By analyzing data from electronic health records, AI can help predict which patients are at higher risk of developing BPH, allowing for early intervention and treatment.
- **Treatment planning:** AI can help physicians plan and optimize treatment for BPH, taking into account factors such as patient

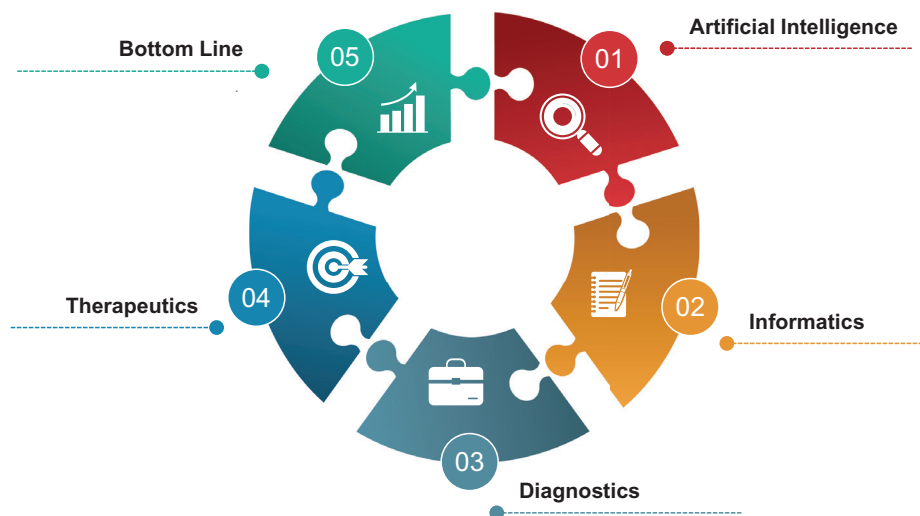


Figure. State-of-the-art talk on benign prostatic hyperplasia topics at the annual AUA meeting in Chicago, 2023.

age, severity of symptoms, and other health conditions.

- **Surgical assistance:** AI can be used to assist surgeons during minimally invasive procedures for BPH, such as transurethral resection of the prostate, helping to improve the accuracy and safety of the procedure.

In summary, AI has the potential to significantly improve the diagnosis and treatment of BPH, helping to reduce the burden of this common condition on patients and health care systems.

Informatics

As in other aspects of life, the Internet is replete with information, some good and lots bad! The world of BPH is no different and while there are 11,900,000 Google BPH hits, 99.2% of them focus on treatments. Unfortunately, cyberchondria runs rampant in the world of BPH. Furthermore, there is a paucity of information directed at underrepresented minorities and men of color. However, this presents enormous opportunities to help educate patients in a more directed fashion.

- **Increase awareness:** Health care providers can raise awareness of BPH and its symptoms and provide education about the importance of early diagnosis and treatment.
- **Improve access to health care:** Policymakers can work to improve access to health care for

underserved minorities, such as by expanding Medicaid coverage or implementing programs to increase the number of health care providers in underserved areas.

- **Culturally sensitive care:** Health care providers can take steps to provide culturally sensitive care to underserved minority patients, such as by offering language interpretation services, respecting cultural differences in health care practices, and addressing any biases or stereotypes that may affect patient care.
- **Research:** Researchers can study the impact of BPH on men and in particular underserved minority communities and develop interventions that are tailored to the specific needs of these populations.

In summary, more comprehensive and trusted information sources will be developed.

Focus on underserved minorities will be a priority to health care professionals, medical centers, and investors.

Diagnostics

The COVID-19 pandemic dramatically changed our world on so many levels. Access to care as well as creating new remote environments for diagnosis and treatment were created and the drive for new technologies accelerated. Noninvasive bladder function tools in the office as well as remote diagnostic

management platforms which allow device tracking and connectivity to both the provider and electronic health records are now available. With the advent of more favorable Current Procedural Terminology code reimbursement for remote monitoring, the opportunities in urology and for all of health care are enormous.

The advantages include:

- Convert care time between visits into new reimbursements
- Add additional visits as needed between regular scheduled follow-ups
- Improve patient compliance and retention via app-based automatic reminders
- Reduce readmission and adverse events, and improve quality scores
- Enable focus on high-risk patients and expand numbers of patients per staff member

In summary, efficiencies in diagnostics using wearable devices and remote platforms is here and urology has the opportunity to focus, adapt, and harness the enormous data repositories which lie ahead.

Therapeutics

Although some in the urological community thought that the BPH treatment regimen algorithm peaked more than a decade ago, it is clear that innovation and BPH seem like the perfect interface. While beyond the scope of this article, there will be a huge menu of treatment choices for urologists and their patients.

Medical therapy using oral agents seems to have peaked and is essentially a generic market albeit branded overactive bladder agents (β 3-agonists) have taken a significant foothold in men with storage symptoms and BPH. Use of injectable agents into the prostate to help reduce prostate size is being investigated by numerous startups.

In 2021, the total minimally invasive and surgical market in the United States was about \$700 million USD with the greatest share being spent on the prostatic urethral lift.

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BENIGN PROSTATIC HYPERPLASIA: PREDICTING THE FUTURE

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Projections by health economists are that this market will top 1 billion dollars within 5 years. However, a number of BPH treatment challenges are on the horizon.

- **Economic:** Economic and reimbursement realities are setting in and will have significant impact on relative market share in the future. While scientific data are important to obtain regulatory approval, winners and losers are often predicated on reimbursement.
- **Real-world data:** Defining treatment success and failure in the BPH arena has been elusive.

There are few uniform definitions and cross-functional criteria have not been widely accepted. A number of real-world data studies have demonstrated incongruity between reported re-treatment and reintervention rates vs those reported in pivotal clinical trials in the literature.

- **Are we waiting too long to treat?** Emerging data of the impact of delaying interventional therapy in lieu of either watchful waiting and/or medication and ensuing potential bladder deterioration are now garnering attention.

When is the appropriate time to treat and to intervene?

The current minimally invasive and surgical market for BPH will continue to evolve. It seems like we are going Back to the Future. Newer lasers, water ablation of the prostate, and improvements in robotic techniques will increase in their usage. On the horizon are various permutations of prostate expanders and springs and a technology using paclitaxel-eluting balloon dilation of the prostate. Many abstracts at the AUA were devoted to early- and mid-stage data on

efficacy/safety of these various new technologies.

Bottom Line

Predicting the future of BPH is easy. It will be a major growth area for urology beyond therapeutics. Many of these new technologies were discussed at the newly launched AUA Innovation Nexus. The integration of strategics, venture capital, entrepreneurs, and urologists will provide the impetus to tremendous growth and opportunity. Buckle up—the ride is going to be amazing! ■

AUA2023: REFLECTIONS

Low Submuscular With Transfascial Fixation for Ectopic Inflatable Penile Prosthesis Reservoir Placement

Nicole M. Wright, BA

Baylor College of Medicine, Houston, Texas

Mohit Khera, MD, MBA, MPH

Baylor College of Medicine, Houston, Texas

The 3-piece inflatable penile prosthesis (IPP) has remained an effective therapy for medically refractory erectile dysfunction for 50 years. Reservoir placement (RP) is considered one of the most difficult steps of implantation, challenging even the skilled surgeon and potentially begetting dire complications. Traditional placement into the space of Retzius has been associated with bladder perforation, iliac vasculature injury/compression, small-bowel erosion/obstruction, erosion into an ileal conduit/neobladder, herniation, and enterocutaneous fistula.¹ These complications are known to occur more frequently in patients with pelvic anatomy complicated by previous surgery, radiation, or anatomical anomaly. In an effort to avoid such complications, “ectopic” RP outside the peritoneal cavity and away from important pelvic anatomy, anterior to transversalis fascia and posterior to the abdominal musculature, was first described by Wilson et al in 2002.² Innovation in ectopic techniques has boomed over the last 20 years as new surgical

methodology has been enhanced, and made possible, by the 1998 introduction of the lockout valve and 2010 release of flat reservoirs, allowing implantation without autoinflation and particularly visible reservoirs, respectively.³

Of the ectopic techniques, one of the first and most well documented is high submuscular RP (HSM). Introduced by Morey et al in 2013, HSM implants the reservoir between the transversalis fascia and rectus abdominus muscle utilizing a pediatric Deaver retractor and Foerster lung-grasping clamp to advance the reservoir cephalad via a transcrotal approach.⁴ Complications of this initial technique included intraperitoneal placement, reservoir visibility/palpability, bowel obstruction, reservoir migration, and reservoir herniation.⁵ Although introduction of the refined “5-step” technique in 2020 effectively lessened the rate of deep pelvic injuries, the issue of herniation, often requiring surgical revision, remains persistent.⁶ It is important to note that although HSM is not the only ectopic technique associated with herniation and palpability issues, its long history has inspired implanters to develop new RP strategies utilizing reinforced spaces and/or additional fixation steps in order to avoid such complications.

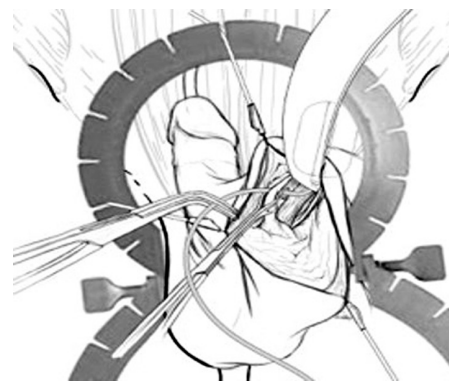


Figure. Placement of reservoir into inguinal ring.

One such recent advancement in ectopic RP is the low submuscular (LSM) with transfascial fixation technique (TFF). First described in patients undergoing pressure-regulating balloon placement for artificial urinary sphincter implantation, LSM with TFF places the reservoir inferiorly in the abdominal wall to prevent visibility/palpability while the fixation step prevents herniation.^{7,8} Approaching via either a penoscrotal or infrapubic incision, an S-retractor is placed in the eternal inguinal ring to elevate the fascia. A space inside the ring below the rectus muscle and above the transverse fascia is then developed using blunt dissection or a ring forceps. Next, the lateral aspect of the inguinal ring is grasped with an Allis clamp while a right angle is passed in an out-to-in fashion through either the lateral or medial

aspect of the fascia. The reservoir tubing is then brought through the fascia and the reservoir placed underneath the rectus muscle and filled with normal saline (see Figure).

The first series of 31 patients undergoing IPP placement or revision with LSM with TFF RP was published in 2022.⁸ Of the 26 patients undergoing follow-up survey, an overall penile implant satisfaction rate of 4.1/5 was reported with 8 (26%) able to palpate the reservoir, 4 (15.4%) able to see the reservoir, and 1 (3.8%) endorsing minimal severity pain from the reservoir. Importantly, overall satisfaction with reservoir concealment was 4.5/5, no patients reported bother from the reservoir, and 96.2% would recommend IPP surgery. Additionally, no surgical revisions were required and there were no surgical complications such as bowel obstruction, herniation, bladder erosion, or vascular injury. These favorable data suggest this methodology can be used in almost all patients, but it is particularly indicated for those with complicated pelvic anatomy and/or a violated space of Retzius.

Overall, LSM with TFF is a safe, reliable, and effective ectopic RP technique that successfully addresses

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LOW SUBMUSCULAR WITH TRANSFASCIAL FIXATION FOR ECTOPIC INFLATABLE PENILE PROSTHESIS RESERVOIR PLACEMENT

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some of the most pressing IPP implantation issues to date: herniation, patient satisfaction, and concealment. Although this series is limited by small sample size, we look forward to continuing our investigation of this promising technique. ■

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Addressing Endometriosis With Multidisciplinary Care: Reconstruction, Rehabilitation, and Advocacy

Yaniv Larish, MD

Robert Wood Johnson Barnabas Health, Jersey City, New Jersey

Introduction

Endometriosis is a complex and debilitating condition affecting approximately 10% of women during their reproductive years and beyond.¹ Endometriosis is characterized by the growth of endometrial-like tissue outside the uterus, including the ovaries, fallopian tubes, peritoneum, and bowel.² The hallmarks of the condition include chronic pelvic pain, dysmenorrhea, and infertility.³ In some cases, endometriosis can also involve the urinary tract, affecting the bladder, ureters, and kidneys.⁴ In severe cases, urinary tract endometriosis can cause loss of function of the bladder and/or the kidney.³ Many patients with endometriosis suffer from urinary and defecatory dysfunction.^{5,6} Despite its significant prevalence, and despite advances in imaging modalities to detect it, endometriosis can be challenging to diagnose as direct laparoscopic examination of the peritoneal cavity remains the gold standard for diagnosis.⁷ Many people with the condition experience a delay in diagnosis, and on average this delay is 7-10 years.⁸

As a urologist, I play a critical role in the diagnosis and management of endometriosis, particularly when it involves the urinary tract. This article provides insight into my work with endometriosis patients, highlighting the importance of a multidisciplinary approach and the urologist's role in the diagnosis and treatment of a complex disease.

Role of a Urologist in Endometriosis Management

Urologists are often the first health care providers to encounter endometriosis patients, especially those presenting with urinary complaints such as urgency, frequency, incomplete emptying, and painful urination.⁵ Rectal fecal incontinence is also present in many of these patients (although it is often difficult to elicit this history).⁹ Through detailed medical history taking, physical examination, and appropriate imaging studies, urologists can identify signs and symptoms suggestive of endometriosis. I have found that the following 3 questions have been sensitive in increasing the likelihood of an accurate diagnosis¹⁰:

1. Do you or have you ever had pain with your period that has resulted in missing school or work?
2. Do you ever have pain with sex?
3. Have you had recurrent urinary tract infections (with cultures showing no growth)?

Affirmative responses to the above questions in combination with elevated AUA Symptom Index scores are highly suggestive of urinary tract endometriosis.

When endometriosis is suspected or confirmed to involve the urinary tract, urologists play a critical role in the multidisciplinary management of the condition. This team typically includes gynecologists, general surgeons, pain management specialists, physical therapists, and mental health professionals. Together, we develop a comprehensive treatment plan tailored to each patient's unique needs, taking into account factors such as

pain severity, fertility goals, and the extent of disease involvement.

Once a week, I meet with my multidisciplinary team to review imaging, case presentations, and insights. I find these weekly meetings to be informative, educational, fulfilling, and necessary to offer the best care to our patients.

Surgery is often an essential component of endometriosis management, particularly when the urinary tract is involved. In these cases I perform robotic-assisted laparoscopic ureterolysis, ureteral reimplantations, partial cystectomies, and pelvic lymphadenectomies. Reconstruction of the urinary tract is the rule, not the exception when it comes to the management of urinary tract endometriosis.

Because many endometriosis patients have bladder and bowel dysfunction, I also find myself treating these complaints with a tailored approach unique to each patient. I use a stepwise approach based on the AUA Overactive Bladder Guideline,¹¹ starting with lifestyle modifications and escalating to second-line pharmacological treatment, and in many cases reverting to third-line therapies including the use of bladder botulinum toxin and sacral neuromodulation.

Because this disease is under-recognized and often misdiagnosed, patient advocacy is critical to anyone caring for patients with endometriosis. The Endometriosis Summit, a patient and practitioner town hall-style meeting that takes place annually, is a unique forum for advocacy and exchange. Physicians can hear directly from patients, centering their experiences as they work to provide state-of-the-art care.

Conclusions

As a urologist, I provide diagnostic and therapeutic care to endometriosis patients, often as part of a multidisciplinary team. The focus of my practice is both reconstruction of the urinary tract and rehabilitation of urinary and defecatory function.

Increased awareness, early diagnosis, and a comprehensive approach to treatment are essential to addressing this complex and often debilitating condition.

I urge you to consider the possibility of this diagnosis the next time a woman of child-bearing age enters your office with complaints of pelvic pain. ■

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RADIOLOGY CORNER

MRI-guided Salvage Cryoablation of Postprostatectomy Seminal Vesicle Bed Recurrence

Derek Lomas, MD
Mayo Clinic, Rochester, Minnesota

David Woodrum, MD, PhD
Mayo Clinic, Rochester, Minnesota

Lance Mynderse, MD
Mayo Clinic, Rochester, Minnesota

A 75-year-old male was initially diagnosed with Gleason $4 + 3 = 7$ prostate cancer and treated with robot-assisted radical prostatectomy. He subsequently underwent salvage radiation secondary to rising PSA with initial response. Unfortunately, his PSA subsequently rose to 4.4 ng/mL and hormone treatment was recommended by local providers. The patient wanted to avoid hormone therapy. The patient was referred for additional treatment discussion. Metastatic workup with gallium 68 prostate-specific membrane antigen positron emission tomography MRI demonstrated findings concerning for seminal vesicle bed recurrence without evidence of metastatic disease (Figure 1). An in-bore MRI-guided biopsy of the seminal vesicle beds demonstrated Gleason $4 + 4 = 8$ prostate cancer in the right bed and benign findings from the left seminal vesicle bed (Figure 2).

MRI-guided salvage cryoablation of the right seminal vesicle bed recurrence was offered. MRI-guided cryoablation was performed using our previously described method.¹ The patient was placed under

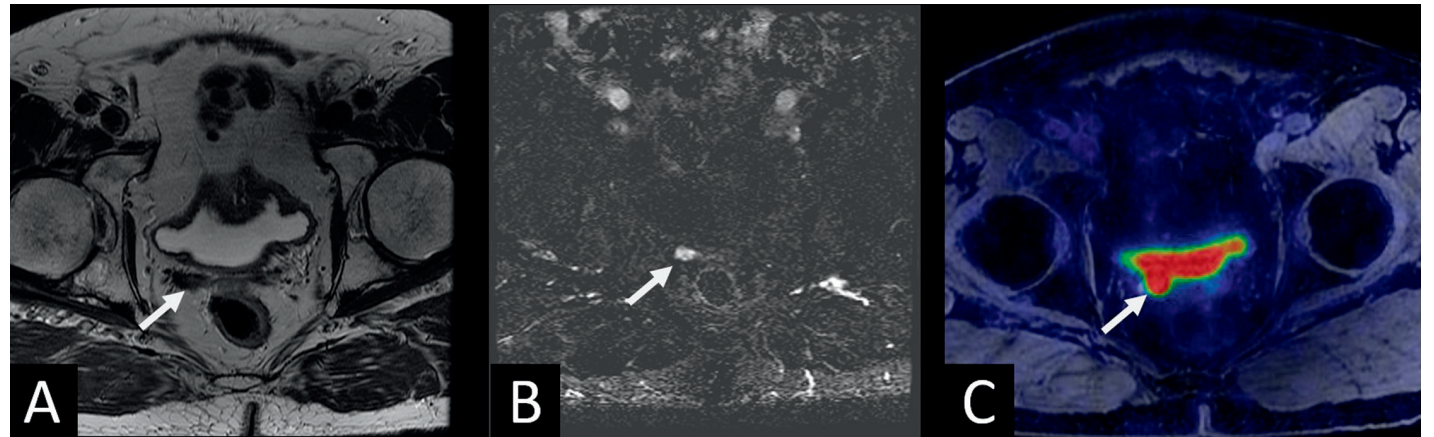


Figure 1. Gallium 68 prostate-specific membrane antigen positron emission tomography MRI showing suspicious lesion in right seminal vesicle bed (white arrows). A, T2-weighted imaging. B, Dynamic contrast-enhanced MRI. C, Fused positron emission tomography/MRI.

general anesthesia and positioned on the MRI table in a semi-frogleg supine position. A guidance grid was positioned against the perineum for transperineal placement of magnetic resonance-compatible cryoprobes.

The proximity of the rectum to the ablation zone can pose a challenge during cryoablation and predispose patients to rectal complications. To increase the distance from the targeted ablation zone and the rectum, saline can be infused transperineally to move and protect the rectum. To perform this, a 14F infusion cannula was placed transperineally under magnetic resonance guidance and sterile normal saline infused via pressure bag.² Figure 3 shows the degree of rectal move-

ment that was achieved.

Due to the proximity of the right ureter to the intended ablation target, a right ureteral stent for identification and protection of the ureter was placed prior to treatment. Previously our practice was to place stents in a separate operative suite prior to the MRI ablation procedure. More recently we have been able to place ureteral stents over a guidewire within the MRI interventional suite using a single-use flexible cystoscope. MRI is used for confirmation of wire and stent placement. Figure 4 shows the guidewire in the right renal collecting system and ureter.

Following adequate saline displacement of the rectum and ureteral stent placement, cryoablation

was performed. A total of 3 cryoprobes were utilized. Continuous MRI was performed throughout the freezing process to monitor the iceball perimeter to ensure comprehensive coverage of the recurrent prostate cancer. Active thawing was employed following each of the 3 freeze-thaw cycles.¹ Figure 5 shows real-time axial and sagittal MRIs obtained during treatment. Following the procedure the ureteral stent was removed and the patient was dismissed home the same day.

This case highlights the usefulness of interventional MRI in prostate cancer care. Beginning with identification of the

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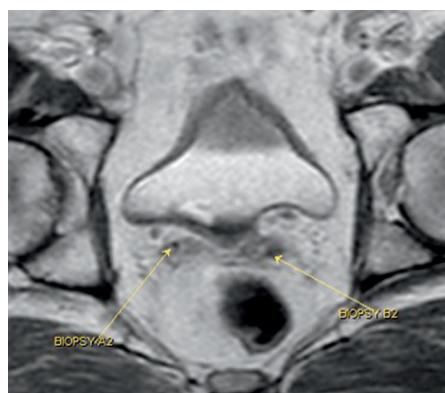


Figure 2. In-bore MRI-guided biopsy of the prostate fossa. Yellow arrows show biopsy needle locations in the right (Biopsy A2) and left (Biopsy B2) seminal vesicle beds.

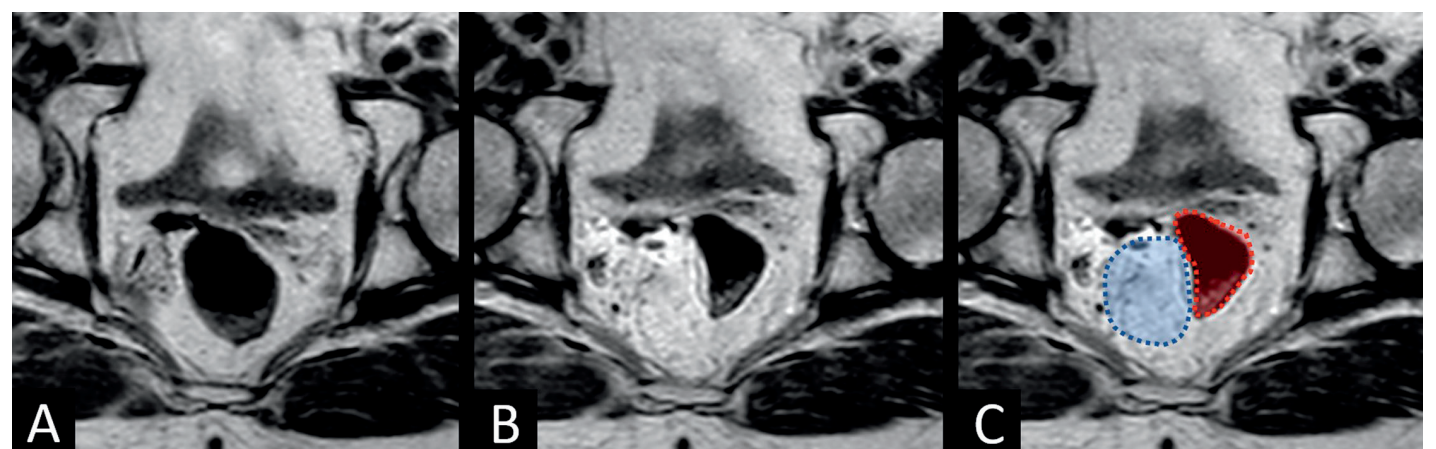


Figure 3. MRIs demonstrating saline displacement. A, Pretreatment imaging. B, Imaging after saline displacement. C, Intraprocedural imaging highlighting approximate area of infused saline (blue dashed line) and displaced rectum (red dashed line).

MRI-GUIDED SALVAGE CRYOABLATION OF POSTPROSTATECTOMY

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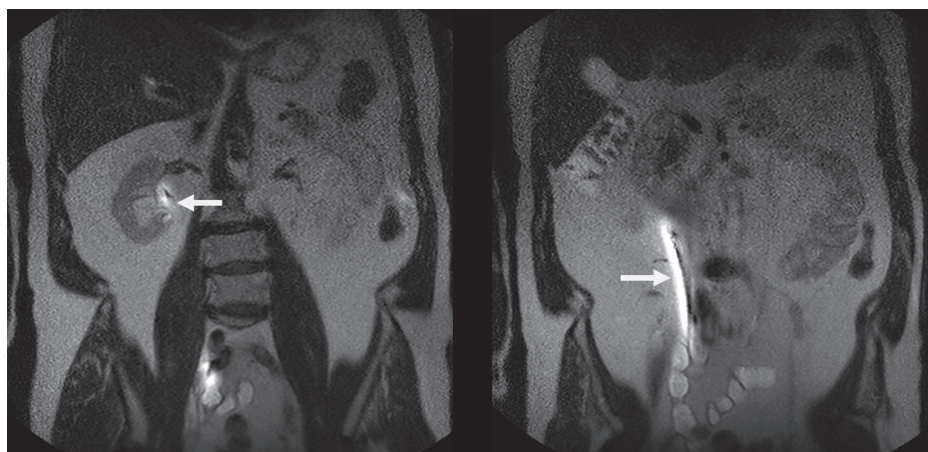


Figure 4. Coronal turbo spin echo MRI demonstrating appropriate placement of guidewire into the right collecting system (arrows) prior to stent placement over wire.

suspicious lesion, in-bore guided biopsy for disease localization and finally MRI-guided treatment with multiplanar MRI imaging was critical at each step of the patient's care. Postprostatectomy patients who have completed

salvage radiation and have image-guided, biopsy-proven localized disease have limited local therapy options. Many who received hormone treatment during their salvage radiation therapy are averse to repeat androgen deprivation.

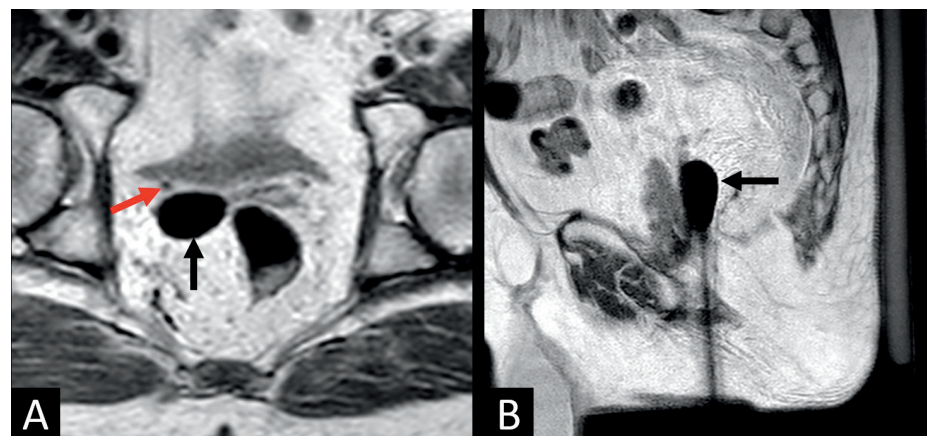


Figure 5. A, Axial image obtained via continuous MRI during iceball (black arrow) formation; red arrow shows stent within ureter. B, Sagittal image showing maximal iceball (black arrow) size at the completion of the freeze cycle.

These select patients may be candidates for salvage MRI cryoablation. This approach offers a potential strategy for effective local disease control and delaying systemic therapy in this patient population. ■

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AUA2023: REFLECTIONS

New Hands-on Skills Course: A Practical Guide on Treating Stress Urinary Incontinence in Men

Susan MacDonald, MD
Penn State Health, Hershey, Pennsylvania

Bob Yang, FRCS
Royal Berkshire Hospital, Reading, England

At this year's AUA, participants from around the world were able to engage in discussion and hands-on training regarding the global options for male stress urinary incontinence (Figure 1). The course, led by codirectors Drs Bob Yang and Susan MacDonald, featured 6 products used to treat male stress urinary incontinence. Urethral bulking was represented by dextranomer/hyaluronic acid and polyacrylamide hydrogel, the urethral slings featured included the AdVance sling and the ATOMS sling, and the artificial urinary sphincters (AUSs) included the ZSI 375 and the AMS 800. The introductory portion of the course featured lectures on the product design, components, durability, success rates, and complications. Patient selection for each category (bulking vs sling vs sphincter) was highlighted as this is crucial to the success of these operations. The adjustable nature of the ATOMS sling and ZSI 375 sphincter were contrasted to their fixed counterparts available in the US, and how/when to add fluid to the systems postoperatively was presented. After a rousing

“This is the perfect course to expand your horizons globally, brush up on a previous skill set, pick up a variation on a theme, or increase your surgical volume by building confidence in a myriad of techniques.”



Figure 1. Faculty and participants from AUA2023 hands-on skills course for treatments of male stress incontinence.



Figure 2. Steve Foley instructs a course participant.

question-and-answer portion, participants were able to jump right in!

Particularly unique were the available models, hands-on simulation, and the individual tips/tricks provided by faculty instruction. Participants were able to inject dextranomer/hyaluronic acid and polyacrylamide hydrogel into pig urethras using cystoscopes and injection needles, giving them a real feel of the resistance during injection as well as the proper mucosal plane to obtain a pillow and thus outlet resistance. Bony pelvis models with simulated

obturator membranes and corpora spongiosum were used to allow participants to pass the trocars for the male sling (Figure 2). Learners could then see how to properly situate and anchor each sling. Finally, for the AUS portion, Boston Scientific kindly provided models created out of the bony pelvis with animal meat that simulated skin, penis, testicles, corpora spongiosum, and corpora cavernosum, giving a nearly true-to-life representation of perineal incontinence surgery (Figure 3). Participants were able to practice



Figure 3. Pelvic anatomy model constructed from meat products, courtesy of Boston Scientific.

measuring the cuff size for an AUS, pass the tubing to a suprapubic incision, seat the pressure-regulating balloon and scrotal pump, and connect all aspects of the device. Additionally, for the ZSI 375 sphincter and ATOMS sling, instructors demonstrated how to add fluid to the systems and discussed judgment of how much/when to add fluid. Each participant was able to perform the surgery at all 6 skills stations in small groups with guidance from faculty instructors, and time was given for questions at the end. This is the perfect course to expand your horizons globally, brush up on a previous skill set, pick up a variation on a theme, or increase your surgical volume by building confidence in a myriad of techniques. Thank you to all who helped make this learning experience possible. ■

AUA2023: REFLECTIONS

Teleurology: Practical Guide to Improve Patient Access to Urological Care

Emmanuel Abara, MB, BS, MBBS, FRCS, FACS, FICS, FWACS, MSc, CH
Northern Ontario School of Medicine University,
Sudbury/Thunder Bay, Ontario, Canada
Richmond Hill Urology Practice and Prostate Institute,
Ontario, Canada

Julia Finkelstein, MD, MPH
Boston Children's Hospital, Harvard Medical School,
Massachusetts

Aaron Martin, MD, MPH
LSU Health New Orleans, Children's Hospital,
Louisiana

As part of the AUA Institute for Business and Leadership offering, *Teleurology: Practical Guide to Improve Patient Access to Urologic Care* was presented in Chicago and is now available on demand. The practice of teleurology continues to evolve with progress in technology and policy. Teleurology encompasses many different forms from the now commonplace audio-only or synchronous audio-video outpatient visits to e-consults and mobile health applications. The terms telemedicine, telehealth, virtual care, digital health, e-health and m-health, and teleurology are used freely and sometimes interchangeably. They share a tripartite currency of people/communities, distance, and technology. While the modern era of teleurology/virtual care can easily be traced to the COVID-19 pandemic telemedicine boom, its origins date back decades to the invention of radio, telegraph, and telephone.^{1,2} COVID-19 dictated social/physical distancing and telemedicine/teleurology offered quality care and access. The relaxation of billing restrictions with the public health emergency (PHE) declaration³ ignited rapid adoption and is now commonplace both in the US and worldwide.

The rapid adoption has led to significant research efforts to evaluate and optimize its clinical effectiveness. The growing body of literature in urology-specific telemedicine strongly supports its place in the urologist's day-to-day practice. It has proven the ability to improve access, efficiency, and convenience of health care, but

must be actively tailored to reduce barriers and build equity.⁴⁻⁶ Continued outcomes evaluation and refinement of criteria for patient selection are needed to ensure safety and efficacy going forward.⁷ These data will come only with collaboration as in other fields of research. Some best practices (see Table)⁶ and "webside manner" were shared as desirable competencies in teleurology practice.

Arguably the biggest factor in teleurology expansion and future advancement is policy regulating allowable and billable practices. Urologists need to be aware of the patient-location-law approach, meaning the licensing rules and medical practice laws are based on the location of the patient at the time of the visit, not the clinician's location.⁸ Additionally, urologists need to be mindful of state, federal, and, if applicable, international rules and regulations when designing a telemedicine offering. The PHE exemptions opened the door to several policies previously restricting widespread adoption, namely patient location, audio-only, and technology requirement restrictions.³ The end of the PHE declaration on May 11, 2023, brought back some restrictions, although few significant to urology until the end of 2023. It is imperative that the AUA joins forces to advocate for legislation to allow teleurology to remain commonplace for the benefit of our patients and our practices.

Designing a telemedicine offering in your practice can be a daunting task but can be broken down into simple steps. First is determining your top 2-3 goals in creating your telemedicine program. These should be selected based on your patients' or communities' needs, not based on the availability of a specific technology. With clear goals, you can select the target population and/or disease process to begin offering visits to. Just as with your in-person practice, scheduling, time management, charting, contingency

Table. Tips to Prepare Yourself and Your Environment

Environment	<ul style="list-style-type: none"> • Ensure space is private • Be close to natural light • Minimize distraction and background noise
Image	<ul style="list-style-type: none"> • Frame face/body (waist up) with camera lens • Avoid shadows and glare
Eye contact	<ul style="list-style-type: none"> • Position yourself/the camera so that eyes appear one-third down from top of the screen • Look directly into the camera to mirror eye contact
Hand gestures	<ul style="list-style-type: none"> • Perform at midchest level • Make bigger and slightly slower than usual
Movements	<ul style="list-style-type: none"> • Sit up straight and lean forward • Stay seated within camera frame • Avoid tapping/fidgeting
Verbalizations	<ul style="list-style-type: none"> • Take purposeful, frequent pauses

Adapted with permission from Finkelstein JB et al, *J Pediatr Urol.* 2020;16(3):289.⁶

plans, and infrastructure needs have to be planned out and rehearsed prior to going live. With the proper preparation, a rewarding teleurology practice is possible. There was a lively interactive session with the attendees contributing their ideas and experience, different scenarios—rural and remote communities of care, geriatrics, veterans, prisoners, and others. Adoption of telemedicine/teleurology in medical education and teaching curricula is bound to expand as technology-driven techniques offer new fronts in telementoring, telesurgery, and global health/surgery. We were reminded to be aware and culturally sensitive to the disparities that exist in age, educational status, rural and urban divide, access or lack of access to the Internet, and acceptable bandwidth. Some people in various communities cannot afford a capable smartphone to enable appropriate access to the burgeoning telemedicine/teleurology/virtual care offerings. As advocates for our patients, we must strive to enhance diversity, inclusivity, equity, and social accountability, promoting and providing hybrid care ("virtual" and "face to face") as desirable and appropriate. Let us set simple, achievable goals toward digital health in teleurology worldwide as we advance to 2025 with the WHO!^{4,10}

Please feel free to reach out with questions, and we look forward to seeing you again in San Antonio. ■

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AUA2023: REFLECTIONS

Semi-live Surgery: En-bloc Holmium Laser Enucleation of the Prostate Using Moses Technology

Nicole L. Miller, MD, FACS
Vanderbilt University Medical Center, Nashville,
Tennessee

Holmium laser enucleation of the prostate (HoLEP) is recognized by the AUA guidelines as a size-independent surgical treatment for benign prostatic hyperplasia.¹ The procedure is minimally invasive and durable, and has a low risk of complications and a short recovery time. This semi-live surgery is intended to demonstrate evolution in the surgical technique of endoscopic enucleation paired with state-of-the-art laser technology to improve patient outcomes following HoLEP.

Case Presentation: A 58-year-old male with bothersome lower urinary tract symptoms (LUTS), hesitancy, weak stream, and nocturia, despite tamsulosin 0.4 mg and finasteride 5 mg orally daily

- AUA Symptom Index: 20
- Quality of Life: 4
- Uroflow: prolonged plateau flow, maximum flow rate 7.1 mL/s
- Post-void residual: 45 mL
- Office cystoscopy: trilobar hyperplasia with intravesical median lobe
- Multiparametric MRI prostate: 100 cc, no high-risk lesion (Figure 1)
- Past medical history: stage 3 chronic kidney disease, elevated PSA (13.7 ng/mL) status post 4 negative prostate biopsies



Figure 1. Coronal image of multiparametric prostate MRI.

Steps of the operation:

1. Identify important structures and landmarks: ureteral orifices, verumontanum, external genitourinary sphincter (EGUS)
2. Early apical release: inverted V incision to release the posterior apex of the prostate, circumferential incision in prostatic urethral mucosa to release the anterior apex of the prostate (Figures 2 and 3)
3. Lateral enucleation plane development
4. Identification and incision of anterior and lateral bladder neck fibers
5. Division of lateral and median lobe attachments
6. Transitional zone adenoma pushed en bloc into the bladder
7. Division of bladder neck attachments
8. Hemostasis
9. Morcellation

While there are different surgical techniques for endoscopic enucleation of the prostate, the en-bloc technique is increasingly being performed. En-bloc enucleation of the prostate involves removal of the entire transitional zone of the prostate as a single tissue block. Potential advantages of the en-bloc technique include shorter operative time, decreased bleeding, reduced risk of transient stress urinary incontinence, and improved histopathological examination.^{2,3} It has also been suggested that utilization of the en-bloc technique during the initial learning curve allows for a faster, more efficient operation without any difference in functional outcomes or major complications.⁴ One reason for this may be that the en-bloc technique offers better visualization due to continuous laminal irrigation flow in the narrow working space and faster identification of the surgical dissection plane.

Early apical release of the prostate is often combined with en-bloc endoscopic enucleation of the prostate. The technique of early apical release is intended to reduce the

risk of unintentional injury to the urethra and EGUS by decreasing traction on the prostatic apex and preserving the urethral mucosa overlying the EGUS. A study by Saitta et al found that early apical release was associated with a lower risk of urinary incontinence after HoLEP.⁵ However, a subsequent study found no significant difference in the rate of urinary incontinence in patients with and without early apical release. Therefore, the benefit of early apical release to reduce the risk of transient urinary incontinence remains uncertain and is an area for future research.

This semi-live surgery also highlights the benefit of using Moses pulse modulation for HoLEP. The

holmium laser pulse is modulated such that the first part of the laser pulse, referred to as the initiation sequence, is emitted creating a small vapor cavity, through which the second part of the pulse is delivered. The end result is optimized energy delivery. The clinical benefit of Moses technology for HoLEP was evaluated in a randomized controlled trial from our center comparing HoLEP with and without Moses pulse modulation. Our study found HoLEP with Moses pulse modulation to result in shorter operative time and hemostasis time, and reduced blood loss.⁶ Similar findings were reported in a

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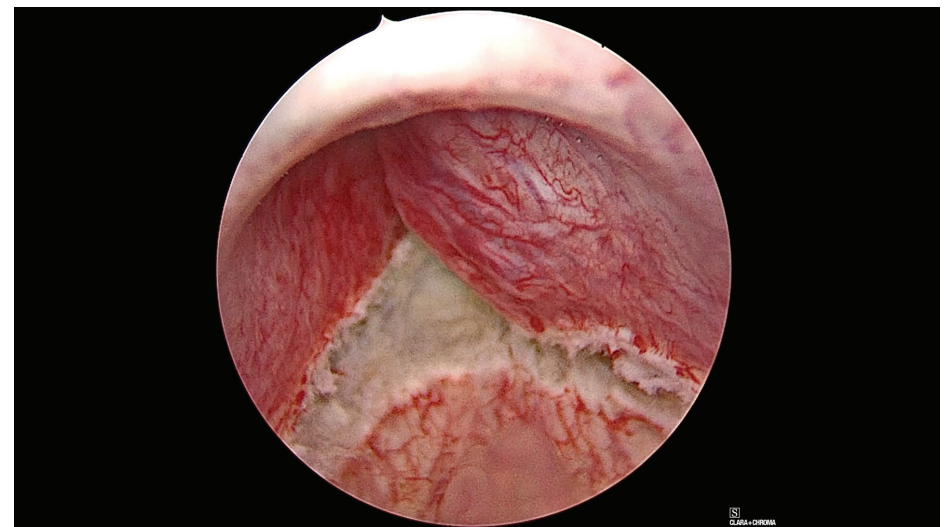


Figure 2. Early apical release en-bloc holmium laser enucleation of the prostate: inverted V incision to release the posterior apex of the prostate.

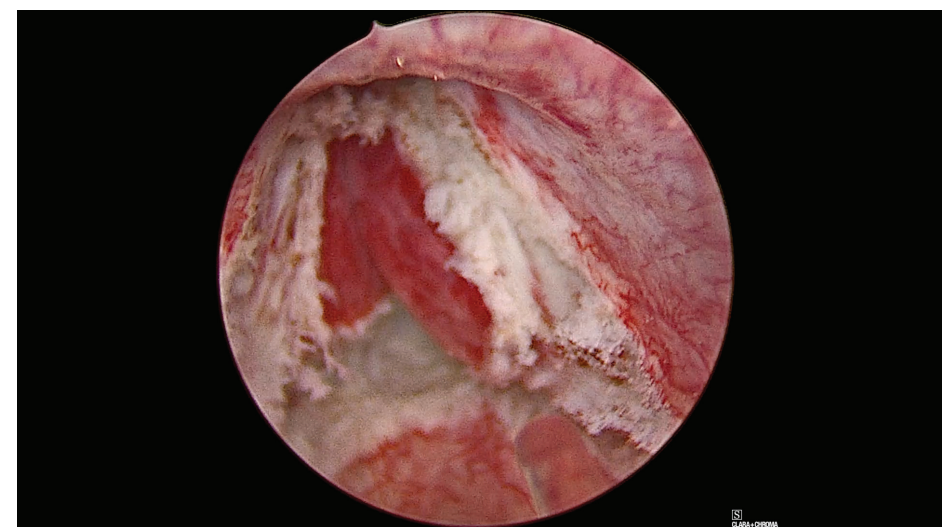


Figure 3. Early apical release en-bloc holmium laser enucleation of the prostate: circumferential incision in prostatic urethral mucosa to release the anterior apex of the prostate.

SEMI-LIVE SURGERY: EN-BLOC HOLMIUM LASER ENUCLEATION OF THE PROSTATE USING MOSES TECHNOLOGY

→ Continued from page 16

“Potential advantages of the en-bloc technique include shorter operative time, decreased bleeding, reduced risk of transient stress urinary incontinence, and improved histopathological examination.”

systematic review and meta-analysis of 7 comparative studies (814 patients) of HoLEP with and without Moses pulse modulation.⁷ Patients

treated with Moses technology had shorter enucleation and operative times, as well as better hemostasis. When considering the utilization of en-bloc technique, early apical release, and Moses technology collectively for endoscopic enucleation of the prostate, as was highlighted in this semi-live surgery, there is evidence for improved outcomes. Socarrás and colleagues conducted a single-arm prospective study comparing en-bloc Moses laser enucleation of the prostate with early apical release to non-Moses en-bloc HoLEP.⁸ En-bloc Moses laser enucleation of the prostate with early apical release was significantly better than en-bloc HoLEP in terms of surgical time, enucleation time, ablation rate, and hemostasis time. Moses pulse modulation has also been shown to result in a reduced risk of fiber tip

degradation during HoLEP which may allow for more effective tissue cutting.⁹ Perhaps the most notable benefit of Moses technology is the ability to safely treat and send many patients home with same-day discharge.¹⁰ Previously, all HoLEP patients required an overnight hospital stay, but the clinical paradigm surrounding HoLEP has vastly improved with the introduction of this laser technology. ■

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AUA2023: REFLECTIONS

Can Vasectomies Be Considered Temporary Contraception?

Ajay K. Nangia, MBBS, FACS
University of Kansas Medical Center, Kansas City

Christopher M. Deibert, MD
Nebraska Medicine—University of Nebraska Medical Center, Omaha

Mary K. Samplaski, MD
Keck Medicine of University of Southern California, Los Angeles

Introduction

The current male choices for reversible and temporary contraception include abstinence, withdrawal, condom, and now the question is whether vasectomy should be considered temporary. There has been no new reversible male contraception in hundreds of years, and even the condom has been considered and used in different forms over that time. Latex was the only reason that condoms not only became more effective, but also led to prevention of sexually transmitted infections (STIs).

In the spectrum of a male’s reproductive life, the need for and

different types of contraception change. When the male is young, free, and single, the main concern is preventing STIs and pregnancy, with the ability to have the opportunity for children later as they wish. Similarly, later in life when a man has completed his family or not having children, the need for permanent status may be more valid over STI prevention. However, if the man is not in a stable relationship, he may continue STI prevention. Equally, the situation is similar for the female contraceptive and reproductive life.

For any medication, especially a contraceptive being used in a healthy population, the contraceptive needs to be 100% safe, 100% effective, 100% reversible, with no short or long-term side effects, and ideally affordable for all groups of patients. This sets a very high bar for drug development. There are ongoing studies and drug development in reversible male contraceptives both by the National Institutes

“The argument of whether a vasectomy is considered permanent or temporary can be viewed either as a logical argument or an illogical argument.”

of Health in the US and others around the world, ranging from hormonal to nonhormonal, as well as mechanical plugs and now maybe even vasectomy! Some of these trials are just in vitro and others are in phase 2b trials.

The argument of whether a vasectomy is considered permanent or temporary can be viewed either as a logical argument or an illogical argument. By definition, and there-

by logically, vasectomy is reversible, so how can it be permanent? Doesn’t that make it temporary? Alternatively, if males currently go into the procedure as being permanent, ie, short- and long-term, even though it is reversible, isn’t that considered more a conversation about permanent status, with sperm freezing and all reversal and/or in vitro fertilization only being an extreme backup in case of a change? That could be divorce, death of a child, or, of course, change in fertility status of a couple in the same relationship.

So why is vasectomy even being considered now as a more deliberate form of temporary contraception? Arguably, this is a US-centric problem that has been highlighted as of June 2022, when *Roe v Wade* was overturned by the Dobbs decision in the US Supreme Court and the reproductive rights of women turned back to the state level when

→ Continued on page 18

CAN VASECTOMIES BE CONSIDERED TEMPORARY CONTRACEPTION?

→ Continued from page 17

previously protected by federal mandate. Several states have now banned or limited female reproductive rights, especially abortion. As a result of this, men have had to step up to the plate and take charge of their own reproductive rights as well as potentially for the couple. This has led to a massive increase in vasectomy consults and procedures being requested. The earliest paper that was published, Patel et al, showed that there was an increased relative search volume in states that had prohibited or limited female reproductive rights compared with states that maintained their rights.¹ This relative search volume has been translated into actual increase in vasectomy consults and procedures since June 2022.^{2,3} The true question is, why has this occurred? Is it because males of legal age who clearly procrastinated prior to the Dobbs decision may well be scared and want to get it done, so there is no further concern, especially in states where the female partner has lost her reproductive rights? The second possible reason could be that males want to take control of their reproductive rights more responsibly and completely, as should have been the case for centuries! Finally, new patients and generations of males may be investigating vasectomy as a possible form of temporary contraception despite the gold standard/dogma/ethical standing on what vasectomy represents. The cross fire panel will discuss both sides of this argument.

—Ajay K. Nangia, MBBS, FACS

Vasectomy Should Not Be Considered Temporary Contraception

In urology, we often have fun and focused debates. Debatable strategies abound: to perc or laser a 1.5-cm stone; active surveillance or treatment for a small renal mass or low risk prostate cancer. What is not debatable? The status of vasectomy as a form of permanent contraception. Guidelines from Europe, Canada, and the AUA ex-

“So if we promise men control over their reproductive futures with the surety that vasectomy provides, how can we also promise reversibility?”

plicitly state vasectomy is permanent.⁴⁻⁶ It has a long-term failure rate of just 0.002%, beaten only by orchietomy or hysterectomy, neither true options!

Yes, about 5% of men will regret their decision for vasectomy.⁷ Yes, urologists have become very competent at vasectomy reversal, with 90% patency and pregnancy rates of 70%.⁸ Yes, in vitro fertilization with sperm retrieval is a good and successful option. But this is no guarantee of future fertility. We are very good with these techniques, but not good enough to promise men we can restore their fertility. And unfortunately the world still lacks a highly effective temporary male contraceptive option.

So if we promise men control over their reproductive futures with the surety that vasectomy provides, how can we also promise reversibility? These are not compatible.

—Christopher M. Deibert, MD

Vasectomy Should Be Considered Temporary Contraception

There is a need for reversible contraceptive options. This need has increased with the overturn of *Roe v Wade*, which has limited access to reproductive care for some patients. For the reasons below, vasectomy should be offered as reversible contraception.

All available reversible contraceptives have limitations, are executed by females, and have concerning failure rates. One study found within 3 months of starting

a reversible contraceptive, 4.2% of women experienced a failure, at 6 months 7.3% had a failure, and by 12 months 12.4% had a failure.⁹ The most common reversible contraceptive used is the oral contraceptive pill, with a 7% typical use failure rate.¹⁰ All contraceptives also have risks. For pill users, there is a 1.2- to 2.2-fold relative risk of thrombotic stroke and a 2.2- to 5-fold relative risk of myocardial infarction.¹¹ Additionally, some women have medical contraindications,¹² or cannot take these medications due to side effects.

Vasectomies are low risk, efficacious, and have a quick functional recovery. The same can be said for reversals, when done by a skilled microsurgeon within a reasonable obstructive interval. The Vasovasostomy Study Group showed that if men underwent reversal within 3 years of vasectomy, there was a 97% patency and 76% pregnancy rate. At 3 to 8 years postvasectomy, there was an 88% patency and 53% pregnancy rate.¹³ These data clearly show that vasectomy reversals work.

Finally, prohibiting vasectomy as a reversible contraception is paternalistic. If men are well informed about the risks of vasectomy and reversal, and patency/pregnancy rates after reversal, it is ultimately the couple's decision to determine the optimal contraception for them. Our role as physicians is to provide patients with information and allow them to make the best decision for their individual circumstances. For all these reasons, vasectomy should be offered for reversible contraception.

Overall, and in closing on this topic, how we interpret the dilemma requires personal reflection based on many of the points brought up in this discussion. It requires a personal decision about the definition of permanent vs patient-informed consent. There are many surgeries we do that are generally quantity-of-life decisions vs quality-of-life decisions. What threshold any clinician decides is adequate to proceed must be based on many factors.

—Mary K. Samplaski, MD ■

“If men are well informed about the risks of vasectomy and reversal, and patency/pregnancy rates after reversal, it is ultimately the couple's decision to determine the optimal contraception for them.”

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CASE REPORT

Epididymal Synovial Sarcoma, a Rare Paratesticular Tumor

V. Olivares

*Finis Terrae University, Santiago, Chile
Clinica Santa Maria, Santiago, Chile*

J. M. Villena

*Finis Terrae University, Santiago, Chile
Clinica Santa Maria, Santiago, Chile*

S. Moreno, MD

Clinica Santa Maria, Santiago, Chile

A. Velasco, MD

Clinica Santa Maria, Santiago, Chile

Introduction

Paratesticular neoplastic lesions are rare. Within these, paratesticular sarcomas are even less frequent, but represent the most common type of genitourinary sarcoma. They arise within the scrotum and originate in the soft tissue that surrounds the testicle including the epididymis, spermatic cord, dartos, and tunica vaginalis. Given the low frequency of the disease, there are limited data to guide management, presenting a diagnostic and therapeutic challenge for clinicians.^{1,2} The cornerstone of treatment is surgical resection, combined with histology-specific chemotherapy and radiotherapy. We present the case of a right epididymal synovial sarcoma in a 60-year-old male.

Case Report

The patient was on regular urological follow-up for a progressive increase in size of his right testicle and was referred to our institution with a scrotal ultrasound that showed a 28-mm solid right “extratesticular” lesion of neoplastic appearance, of possible epididymal origin, and in close contact with the right testicle, causing deformation of its upper pole. An MRI of the abdomen and pelvis was performed showing a right paratesticular tumor that seemed to arise from the tunica vaginalis; positron emission tomography–CT did not show any distant dissemination. The patient underwent an extended right radical orchiectomy with high ligation of the

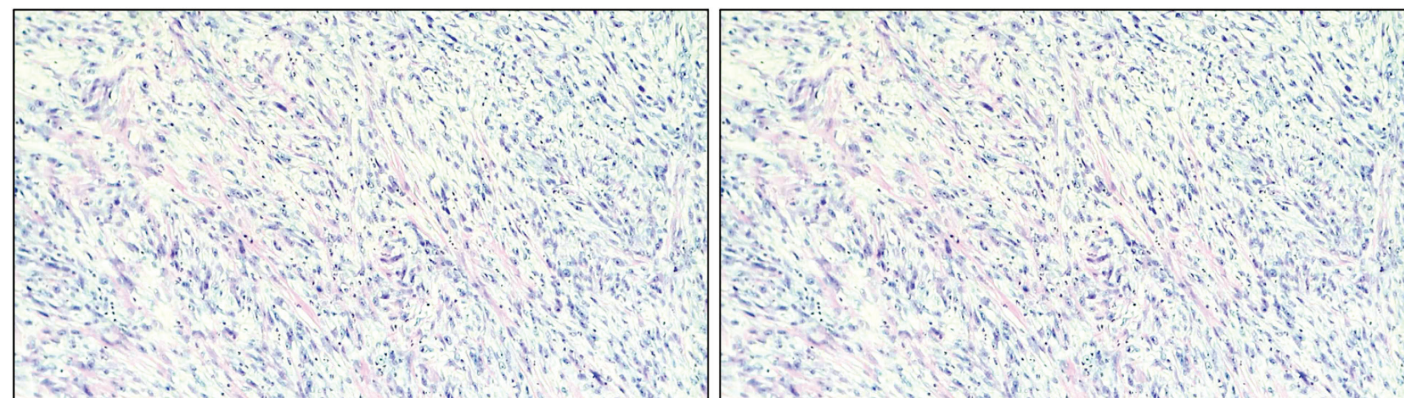


Figure 1. Hematoxylin-eosin stain showing a high-grade spindle cell sarcoma with areas of necrosis and marked nuclear pleomorphism.

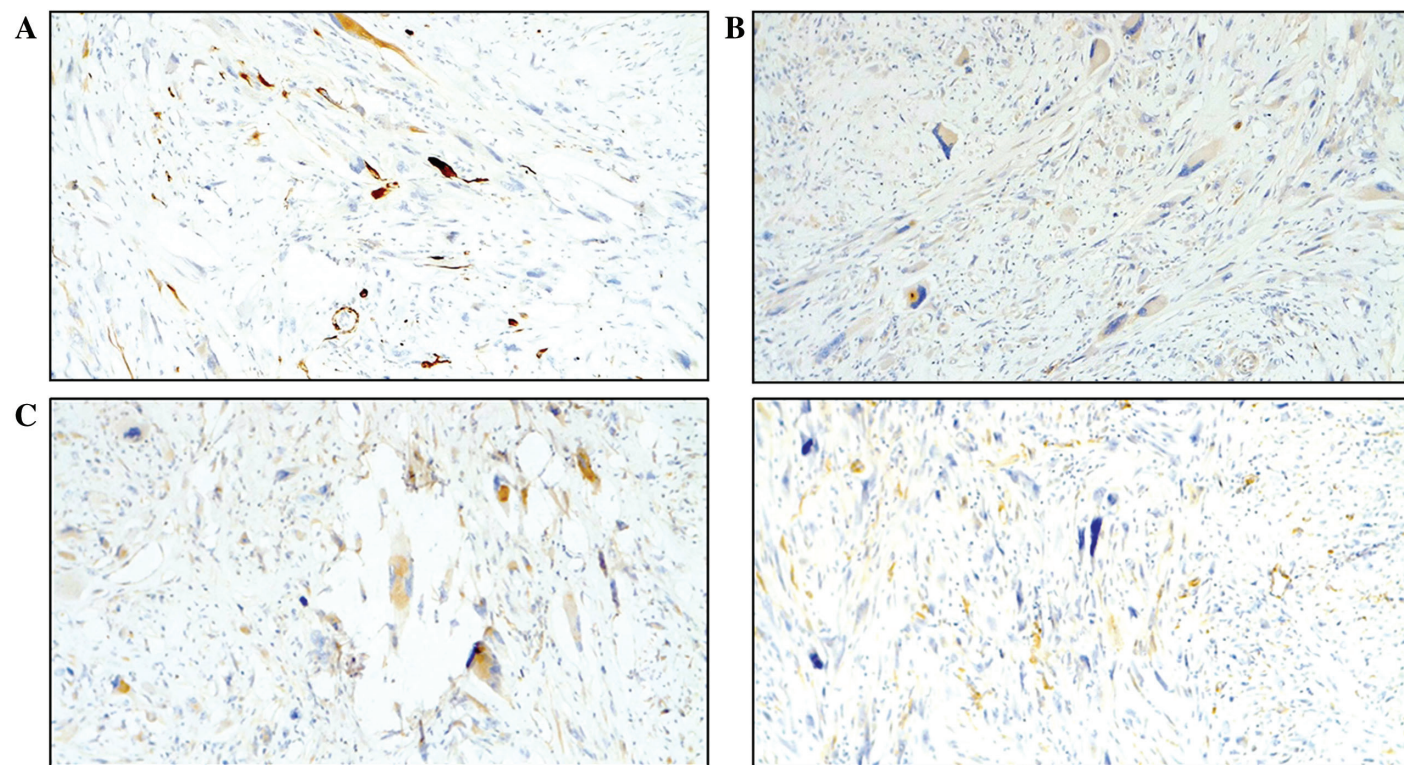


Figure 2. Positive immunohistochemistry. A, Smooth muscle actin. B, Epithelial membrane antigen. C, CD99.

spermatic cord without incident, and his postoperative recovery was uneventful. The histopathology report confirmed a 4.2-cm tumor replacing the epididymis, corresponding to a high-grade spindle cell sarcoma with areas of necrosis and marked nuclear pleomorphism (Figure 1). In addition, satellite nodules in the tunica vaginalis and secondary hydrocele were identified. No lymphovascular invasion or spermatic cord involvement was observed. Smooth muscle actin, epithelial membrane antigen, and CD99 (cluster of differentiation 99) antigen were positive on immunohistochemistry (Figure 2, A-C).

These histological and immunohistochemical findings were consistent with a grade 3 monophasic synovial sarcoma. The patient also received intensity-modulated radiation therapy: 3,000 cGy in 5 sessions in the scrotum, and after 1 session of 800 cGy in the abdomen. He was monitored with positron emission tomography–CT, which revealed multiple retroperitoneal and pulmonary lesions, possibly secondary. It was discussed in the oncology committee and a decision was made to proceed with complementary chemotherapy. OncoDEEP (a comprehensive biomarker test) demonstrated that the

patient is a candidate for cyclins. He is currently awaiting follow-up.

Discussion

Paratesticular tumors are infrequent scrotal masses, accounting for less than 5% of all scrotal tumors,³ with a slow and indolent onset, and in most cases are of a benign nature (70%).⁴ The most common subtypes of paratesticular sarcomas are liposarcomas, leiomyosarcomas, and rhabdomyosarcomas, and they occur most frequently between the second and sixth decade of life.^{2,5}

EPIDIDYMAL SYNOVIAL SARCOMA, A RARE PARATESTICULAR TUMOR

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Ultrasound is the most widely used diagnostic method; however, it does not always accurately achieve a differential diagnosis prior to surgery. In the case where the diagnosis is equivocal, MRI can further characterize the lesion, defining the location of the tumor and its relationship with the surrounding structures.^{1,2,6} CT of the abdomen and pelvis, and the thorax, is typically the modality of choice for staging tumor spread.^{2,4}

Soft-tissue sarcomas account for 1% of all adult malignancies.⁷ Synovial sarcoma is a mesenchymal neoplasm that appears in children and young adults, and most frequently affects the extremities, representing 5%-10% of all histological types of soft-tissue sarcomas. It is usually regarded as a high-grade tumor and patients develop metastases particularly in the lungs. Unusual locations have been reported, including the mediastinum, lungs, peritoneum, and the

testis.⁸ Paratesticular synovial sarcoma is an extremely rare malignant tumor. Standard management consists of wide excision of the tumor, with clear margins in order to reduce the risk of local recurrence.^{2,9,10} Age of presentation, tumor size, histological tumor grade, proximity to the inguinal canal, and surgical margins are important prognostic factors that have been implicated in recurrence.^{2,9,11} Furthermore, achieving clear margins in the first instance is key to disease-free survival. Adjuvant therapy has been described for larger and deeper synovial sarcomas.^{9,10} Chemotherapy does not have an established role, and its routine use is yet to be supported.^{2,12} On the other hand, radiotherapy has promising data in reducing locoregional recurrence; however, there are few published studies that support it.^{2,12,13} Long-term follow-up is recommended for all patients, as recurrences have been seen several years after treatment.

The majority of high-grade tumors tend to recur, namely in retroperitoneal nodes or systemically, and thus, should be followed closely.^{2,4}

Conclusions

Synovial sarcoma should be considered in the differential diagnoses of paratesticular soft-tissue tumors because of the importance of early and aggressive management. According to the literature, most paratesticular sarcomas progress without recurrence, making our case exceptional considering the histological subtype and the rapid imaging progression it presented. ■

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AUA2023: REFLECTIONS

Benign Prostatic Hyperplasia Semi-live Surgical Techniques

Michael Palese, MD

Icahn School of Medicine at Mount Sinai, Mount Sinai Health System, New York City

Francisca Larenas, MD

Icahn School of Medicine at Mount Sinai, Mount Sinai Health System, New York City

The Benign Prostatic Hyperplasia (BPH) semi-live surgical techniques session at this year's AUA meeting showcased 4 different procedures for the treatment of BPH: holmium laser enucleation of the prostate, iTind, Rezūm, and prostatic urethral lift (PUL). Renowned experts in the field presented these procedures, highlighting key steps, advantages, and patient selection criteria.

Dr Nicole Miller, from Vanderbilt University Medical Center, presented her technique for holmium laser enucleation of the prostate using a Moses laser. The case involved a 58-year-old male with a 100-g trilobar prostate and a prominent medium lobe.

En bloc technique was demonstrated, starting with an inverted V incision near the verumontanum. Blunt enucleation was performed, preserving the mucosa around the external sphincter, for early release. This step is done with a low-energy setting (2 J, 20 Hz). Moses pulse modulation technology is particularly beneficial for controlling small blood vessels and maintaining excellent visualization. Providing adequate countertraction during enucleation is essential. Attention was given to the transition point between the bladder neck and prostatic adenoma, releasing attachments to the median lobe. During this step, higher-energy laser settings were used (2 J, 40 Hz).

The advantages of using the Moses laser with the en bloc technique were emphasized, including superior hemostasis, enhanced visualization, shorter hospital stays, and the potential for same-day discharge.

Dr Bilal Chughtai, associate professor of urology at Weill Cornell Medical College, presented the Temporary Implantable Nitinol Prostate Stent for BPH (iTind). This Food and Drug Administration-approved procedure involves the temporary implantation of a stent for 5 to 7 days, creating deep, bloodless incisions.

The iTind is a single-use stent with 3 nitinol cutting struts which can be deployed with a rigid or flexible cystoscope. Correct positioning of the stent with the anchoring leaflet placed behind the bladder neck is crucial. Removal of the stent is done using a catheter and retrieval snare provided in the iTind kit. The entire procedure can be performed in an office setting under local anesthesia, and postoperative catheter is not required.

Patient selection criteria include prostate volumes of 25 to 75 g, absence of an obstructive medium

lobe, and good bladder function. Patients with high bladder necks typically have excellent results. The procedure provides immediate symptom relief with improved urinary stream without compromising sexual function.

Dr Michael Palese, urology professor at the Icahn School of Medicine at Mount Sinai, detailed his step-by-step technique for Rezūm, a treatment designed for prostates ranging from 30 to 80 g, with potential to treat medium lobes.

Rezūm involves 9-second injections of water vapor at 103 °C into the prostate, effectively heating it to 70 °C, using conductive energy, which results in tissue necrosis. Approximately 1 treatment is required for every 10 g of tissue.

The procedure starts with a preliminary treatment performed outside the patient to clear condensation

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BENIGN PROSTATIC HYPERPLASIA SEMI-LIVE SURGICAL TECHNIQUES

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from the delivery device. The device is then atraumatically inserted into the urethra to minimize bleeding and maintain optimal visibility. Next, the treatment zone is determined by measuring the fields of view between the bladder neck and verumontanum, which is the distance from the device tip to where its arms extend (0.5 cm). Treatment is initiated on a lateral lobe, with a 90° angle, 2FOV away from the bladder neck, with subsequent injections spaced 1 cm apart. It is recommended to complete treatment on one entire lobe before proceeding to the contralateral side. For medium or central lobes, a 45° angle is utilized to prevent injury to the rectum. Throughout the procedure, maintaining stability in hand movements is vital to ensure optimal delivery of the energy. Observation of bubbles during vapor injection serves as an indicator of an inade-

quate seal, which may compromise treatment effectiveness. However, once the needle is deployed, repositioning should be avoided to prevent bleeding. It is crucial to thoroughly assess the treatment area for any gaps or the need for potential retreatment, which can be accomplished by identifying areas without tissue blanching. Finally, the cystoscope is removed, and a urethral catheter is placed for a period of 5 days, except in patients with prostates larger than 80 g, who require catheterization for 2 weeks.

Rezūm can be performed in an office setting under sedation and has exhibited excellent outcomes, with a low long-term surgical retreatment rate of 4.4%. Moreover, it generally preserves ejaculatory function. Patients typically experience noticeable results by the 12-week mark.

The final presentation was given by Dr Gregg Eure, from Urology of

Virginia, on PUL. This procedure involves creating an anterior channel in the prostate by deploying implants to relieve urinary obstruction. Accurate placement is crucial for optimal results, starting at the bladder neck and pulling 2 cm back. Treatment of a medium lobe is possible by mobilizing it away from the neck and then extending it out toward the lateral lobe. Although the medium lobe is not obliterated, the goal is to create a pathway, relieving urinary obstruction.

The procedure effectively relieves urinary obstruction, allowing patients to go home without a catheter in most cases. It can be done in an office setting and does not impact ejaculation.

Recent advancements in PUL include the UL2 system and the Advanced Tissue Control device.

The UL2 system improves the delivery of PUL with an ergonomic design, fewer cystoscopic exchange-

es, and more consistent implant deployment. It also offers improved suture cutting and a smaller packaging footprint. The Advanced Tissue Control device enhances precision in PUL by featuring expandable wings with laser-etched marks for accurate implant placement. It helps in gripping tissue and ensures effective deployment of the implants. These advancements have made PUL more efficient and precise.

In summary, the session provided valuable insights into 4 different procedures for treating BPH. Urologists should carefully evaluate each patient's case when selecting a treatment option and be aware of key aspects for each procedure to achieve optimal outcomes. These advancements in BPH treatment offer patients a range of options that can provide symptom relief, improved urinary flow, and minimal impact on sexual function. ■

AUA2023: REFLECTIONS

Imaging Impacts Urological Outcomes: What a Urologist Should Know

Jelle Barentsz

Radboud University Nijmegen Medical Center,
The Netherlands

Tavya G. R. Benjamin, MD

Northwell Health, New York, New York

Ardeshir R. Rastinehad, DO

Northwell Health, New York, New York

In years prior, the basis for biopsy rested entirely within the hands of the urologist, mainly through PSA evaluation and digital rectal exam. As prostate MRI and the use of PSA density have gained traction, the weight of the physical exam has diminished, evidenced by its lack of inclusion in current AUA guidelines for the early detection of prostate cancer. Prostate MRI has revolutionized how we diagnose prostate cancer, particularly since the advent of magnetic resonance/ultrasound-guided fusion prostate biopsy. Unfortunately, it has also made urologists heavily dependent on our radiology colleagues. Though there is nothing inherently wrong with this

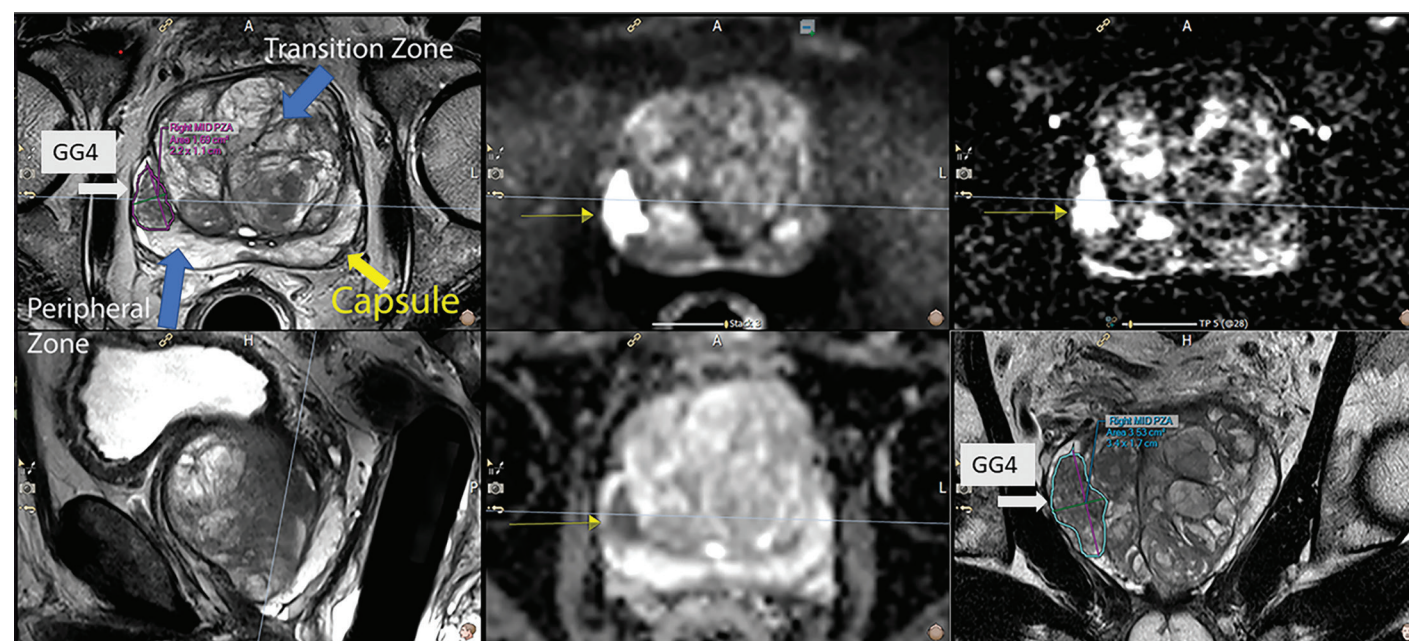


Figure. Prostate MRI depicting a right, mid-gland, anterior peripheral zone lesion. Sequences shown are (clockwise): axial T2-weighted imaging (T2WI), diffusion-weighted b=2,000 s/mm², dynamic contrast-enhanced, coronal T2WI, apparent diffusion coefficient, and sagittal T2WI. GG indicates grade group; PZA, anterior peripheral zone.

dependency in the setting of a radiologist who is well versed in reading prostate MRIs, many urologists are not fortunate enough to work with

such experts. This limitation highlights the need to formalize training residents and attendings on how to interpret prostate MRIs. Training urol-

ogists can be accomplished in various ways, whether hands-on small

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IMAGING IMPACTS UROLOGICAL OUTCOMES: WHAT A UROLOGIST SHOULD KNOW

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group sessions, grand round lectures, or formalized courses.¹ This skill has far-reaching impacts, including biopsy decision-making, focal therapy candidacy, and surgical treatment planning. Mastery of prostate MRI interpretation will not only make us better diagnosticians but also better surgeons. A recent study demonstrated an approximately 50% decrease in the incidence of positive margins during prostatectomy by providing real-time 3D visualization of tumor and prostate gland relationships.²

The section below aims to provide a brief overview of prostate MRI, including what to look for in each sequence (see Figure).

Image Quality

Consistently obtaining high-quality images for the detection, localization, staging, and follow-up of clinically significant prostate cancer (csPCa) can be challenging due to variations in MRI scanners, software levels, and the experience of prostate MRI technologists.

It is crucial that prostate MRI scans adhere to the Prostate Imaging Reporting & Data System (PI-RADS) v2.1 guidelines and are conducted by trained MRI technologists using a standardized protocol comprising T2-weighted (T2WI), diffusion-weighted (DWI), and dynamic contrast-enhanced imaging (DCE-MRI). Modern scanners offer improved consistency and high-quality images. Although the PI-RADS v2.1 standard does not provide specific recommendations for patient preparation, proper preparation is essential to achieve optimal image quality. Patient preparation involves ensuring patient comfort, providing clear instructions and communication before and during the scanning procedure, and considering using antispasmodics and rectal air removal (micro-enema) where applicable. While artifacts can still affect multiparametric MRI images, using modern machines, techniques, faster image protocols, and appropriate patient preparation can help minimize their impact.

T2WI

T2WI provides anatomical and morphological information about

the prostate and surrounding structures. These images are typically acquired in 3 perpendicular planes, allowing visualization of the zonal anatomy and the relationship between the prostate and its surroundings. T2WI helps differentiate the high-signal (bright) peripheral zone (PZ), the heterogeneous mixed-signal transition zone (TZ), and the low-signal (dark) central zone (CZ). The high signal in the PZ is often caused by cystic degeneration with high fluid content and is usually surrounded by a thin hypointense rim, representing a pseudocapsule.

The TZ exhibits mixed signal intensity due to various stages of benign prostatic hyperplasia (BPH) nodules. The CZ contains more dense fibrous tissue and thus appears as a low-signal area.

Lesions can be anatomically localized, and their shape, form, and size can be assessed on T2WI. Zonal distinction of the prostate is important for PI-RADS assessment. In the TZ, T2WI is used to detect csPCa, while in the PZ, DWI is more dominant. The high-signal PZ may show areas of lower signal intensity due to the presence of prostate cancer (PCa; see Figure), although PCa can also present as iso-signal areas or nonfocal mildly hypointense abnormalities. Low-grade PCa or nonmalignant conditions like scar tissue, hemorrhage, atrophy, postradiation changes, and prostatitis (including granulomatous prostatitis) often have low signal (dark) intensity on T2WI, making it challenging to differentiate them from csPCa based solely on T2WI signal. However, differentiation between csPCa, low-grade PCa, and benign pathology can be achieved by considering the anatomical and morphological characteristics. csPCa is likelier to exhibit a focal, round, or irregular structure. At the same time, postprostatitis fibrosis is characterized by a wedge-shaped appearance, and prostatitis by a more diffuse appearance.

Features indicative of csPCa in the TZ on T2WI include areas with ill-defined margins, focal homogeneous intermediate-low signal (referred to as the “erased charcoal drawing sign”), a noncircumscribed, lenticular, or fusiform

shape, and invasion of surrounding structures (“disruption of organized chaos”). To determine whether an abnormal region is suspicious for csPCa, T2WI should be used in conjunction with the other 2 functional imaging techniques.

DWI

DWI is considered the most important functional technique, corresponding to histopathological findings. DWI provides information on the diffusion of intracellular water, which is reduced in dense, hypercellular tissue, leading to restricted diffusion. This is visible as a low signal (dark) on the DWI-derived apparent diffusion coefficient (ADC) map. Conversely, low cell density appears as a high signal on the ADC map. Another DWI-derived image is the high b-value ($>1,400$ s/mm²) image, where hypercellularity appears as a high signal (bright) and low cell density appears dark. The normal PZ, which contains fluid-filled glandular structures with high water molecule velocity, has a high signal on the ADC map. csPCa replaces normal glandular tissue and exhibits hypercellularity, resulting in a low signal on the ADC map (restricted diffusion). There is an inverse relationship between ADC values and Gleason score, meaning that decreasing ADC values correlate with increasing Gleason score. However, in the TZ, BPH can also exhibit restricted diffusion. Therefore, DWI is more accurate for csPCa detection in the PZ than in the TZ. Focal lesions are more likely to be csPCa than diffuse lesions, such as those caused by prostatitis. It is important to note that DWI is susceptible to artifacts, which can be caused by factors such as bowel peristalsis, total hip prosthesis, or rectal gas.

DCE and T1-Weighted Imaging

DCE-MRI involves T1-weighted images that show tissue enhancement (vascularization) after the injection of a contrast agent. Due to tumor angiogenesis and higher vessel permeability, low-grade PCa and csPCa, cellu-

lar-BPH, and inflammation show earlier, and more pronounced, enhancement than other prostate tissue. Therefore, accurately differentiating benign structures such as highly vascularized prostatitis in the PZ or highly perfused cellular BPH in the TZ from csPCa is challenging. DCE-MRI is valuable for detecting local recurrences (eg, postradiotherapy or after radical prostatectomy) and can help identify prostatitis in untreated patients and provide additional information in equivocal cases.

Interpretation

To enhance standardization, lesions should be scored using the PI-RADS assessment system. TZ lesions showing the “erased charcoal drawing” or disruption of “organized chaos,” as well as PZ lesions appearing black on the ADC map and white on the high b-value DWI, should be evaluated for a high likelihood of csPCa using the PI-RADS system. When multiparametric MRI is of good quality and evaluated according to PI-RADS v2.1 recommendations, it provides valuable information that can be used alongside other clinical data to reliably exclude csPCa and avoid unnecessary biopsies, guiding the targeting of MRI-directed biopsy cores. The Figure demonstrates an excellent MRI quality with clear delineation of the PZ vs TZ. Within the TZ one can identify nodules with a distinct border as well as the right mid-anterior peripheral zone lesion. The prostatic capsule is visualized with a dark line around the PZ posteriorly and TZ anteriorly.

In conclusion, these are transferable skills with respect to prostate MRI interpretation, which will impact your magnetic resonance/US fusion-guided prostate biopsies, focal therapy planning, surgical planning, and most importantly your patients’ prostate cancer outcomes. ■

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A USMART Mentee Perspective on Collaborative Urological Research, Aging, and Bladder Cancer Biology

Benjamin T. Ristau, MD

UConn Health, Farmington, Connecticut

Dylan Baker, PhD

The Jackson Laboratory for Genomic Medicine, Farmington, Connecticut

Paul Robson, PhD

The Jackson Laboratory for Genomic Medicine, Farmington, Connecticut

George Kuchel, MD

UConn Health, Farmington, Connecticut

Many urologists express a laudable desire to improve patient care. In its traditional sense, the term “research” conjures images of pipettes and test tubes. At its core, however, the goal of any research is to improve patient care and outcomes. In 2017, Waingankar et al provided a framework describing 4 risks that influence surgical outcomes; these included disease risk, patient risk, clinician risk, and system risk.¹ While originally intended to characterize factors associated with surgical quality, this model can be adapted to conceptualize areas where researchers can focus. Treatment decisions and outcomes are affected by disease processes, patient factors, provider skills and knowledge, available tools/treatments, and the health care system. Therefore, researchers can advance knowledge and effect change by focusing on disease biology (basic or translational), patient factors (aging/frailty, competing risk models, quality-of-life preferences), clinician knowledge/ability (education, implementation science), treatment tools (engineering, innovation), and/or health care delivery systems (health services research, policy/advocacy; Figure 1).

Treatment decisions that prioritize the unique characteristics of an individual patient and that patient’s disease over what works best for the average patient in a population result in ideal outcomes. I (BTR) am fortunate that our research at UConn Health is supported both by local and USMART mentorship. It centers on the intersection of bladder cancer treatment with the increasingly aging population in collaboration with the UConn Center on Aging and bladder can-

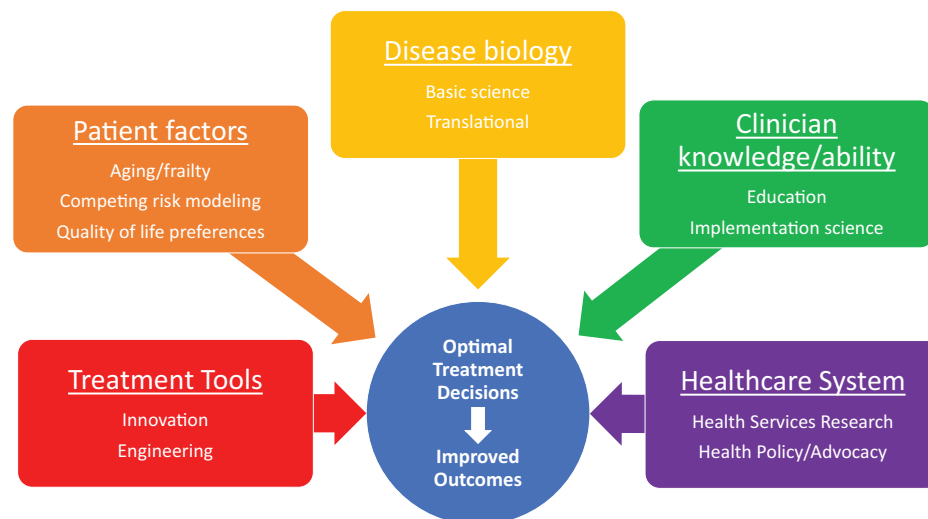


Figure 1. Areas of research focus to optimize treatment decision-making resulting in improved outcomes.

cer biology through team science with the Jackson Laboratory for Genomic Medicine.

Bladder cancer is diagnosed at a median age of 73 years, an age projected to increase in coming years. The risk of invasive cancer increases with aging and is reflected in lower 5-year survival rates among patients >75 years. Guidelines for clinically localized, muscle-invasive bladder cancer (MIBC) recommend either neoad-

juvant chemotherapy with radical cystectomy and urinary diversion or combination chemoradiation therapy.² Radical cystectomy with urinary diversion is major surgery with up to 64% of patients experiencing a complication within 90 days.³ Importantly, the average risk of complications is similar in octogenarians selected for surgery compared to younger individuals. Nonetheless, many older patients with invasive bladder cancer ap-

pear to be undertreated relative to younger cohorts,⁴ and could have benefitted from more aggressive treatment to prevent cancer-related declines in quality of life. In contrast, other individuals of the same chronological age are clearly overtreated, and a more conservative approach incorporating palliative/supportive care may have been preferred as they suffer unacceptable side effects following radical cystectomy.⁵ The current status quo underscores a need to optimize quality of life and health span by more accurately matching treatment intensity with heterogeneity in individual physiology or frailty irrespective of chronological age. Several clinical measures of frailty have been developed, yet none have gained widespread clinical use in older adults with bladder cancer. An approach that emphasizes assessment of frailty and physical performance and that incorporates use of selected biomarkers may be more appropriate for pretreatment assessment of

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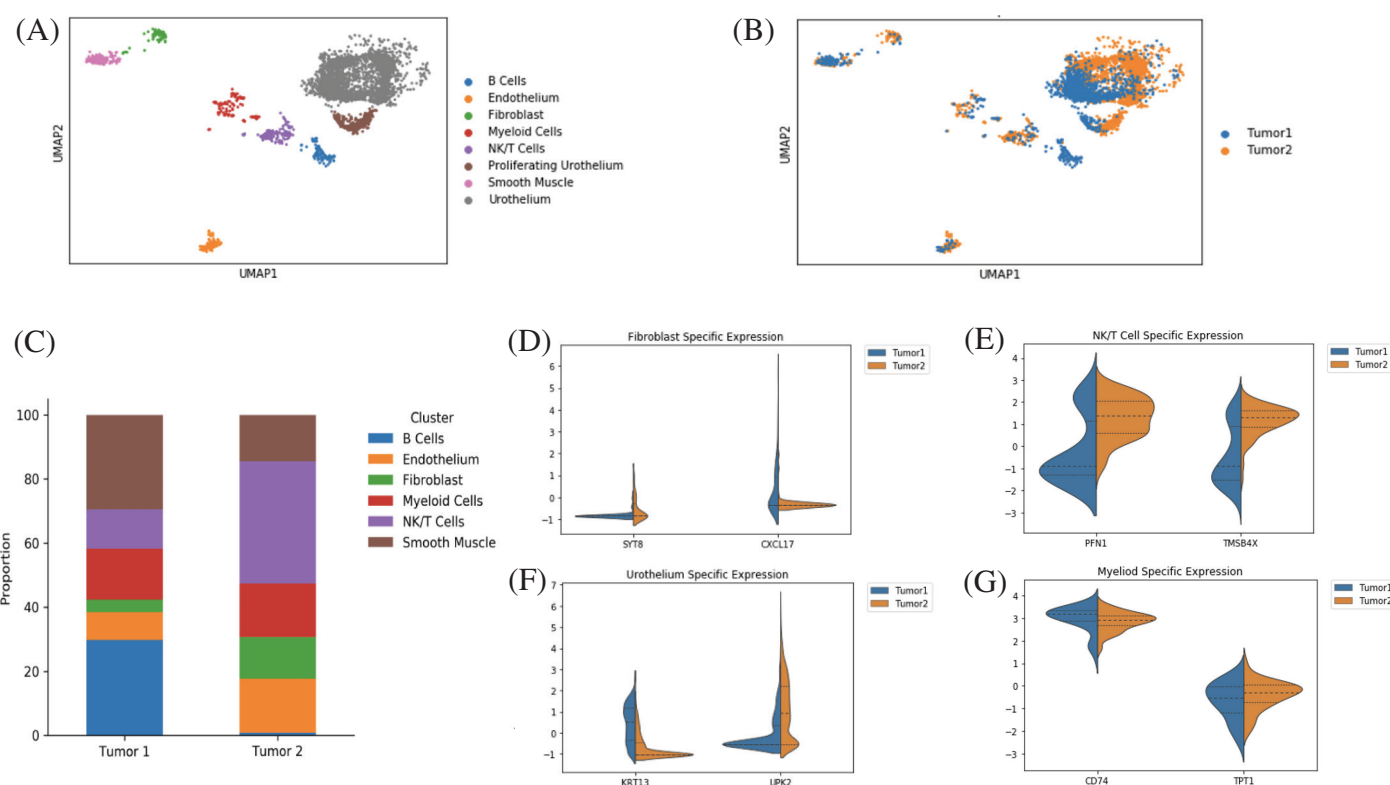


Figure 2. Single-cell RNA sequencing of 2 transurethral resection of bladder tumor specimens from treatment-naïve patients diagnosed with T1 high-grade urothelial carcinoma. The 2 tumors demonstrate different cell populations (A, B) and proportions of cell populations (C) despite being of the same stage and grade. Cell populations within each tumor demonstrate different transcriptomic profiles (D-G).

A USMART MENTEE PERSPECTIVE ON COLLABORATIVE UROLOGICAL RESEARCH, AGING, AND BLADDER CANCER BIOLOGY

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patients with MIBC and may lead to more optimal outcomes. In collaboration with the UConn Center on Aging, we have proposed prospective evaluation of physical frailty and select liquid/tissue biomarkers in older patients with MIBC referred for cystectomy.

Bladder cancer is a heterogeneous disease, and there is marked variation in clinical outcome when patients are categorized by traditional stage and grade. Despite creation of recurrence and progression risk scores based on clinical parameters, recurrence for patients with Ta and T1 nonmuscle-invasive bladder cancer ranges from 15%-61% and progression ranges from 1%-17% at 5 years.⁶ Among patients with carcinoma in situ, disease progression is estimated at 54%; however, there are no known clinical parameters that reliably distinguish progressors from nonprogressors.⁷ Similarly, outcomes for patients with MIBC are heterogeneous. For example, randomized trials have demonstrated

that the complete response rate to neoadjuvant chemotherapy is 38%; however, a surgeon's ability to predict complete response and avoid radical surgery has been elusive to date.⁸ Furthermore, in those without a complete response to chemotherapy for whom additional treatment is advisable, the decision to proceed with surgery as opposed to chemoradiation bladder-sparing protocols lacks a robust biological basis. While molecular classifications are promising⁹ and have been correlated with clinical outcomes,¹⁰ few of these therapeutic targets have been adopted into routine clinical practice. To date, we have generated preliminary data from single-cell RNA sequencing of transurethral resection of bladder tumor specimens demonstrating that tumors of identical stage and grade are comprised of different cell populations and proportions (Figure 2, A-C). Further, these "identical" tumors show divergent expression profiles (Figure 2, D-G). Despite clear cel-

lular molecular variation, these 2 tumors would be treated identically in clinical practice based on tumor grade and stage. This may be one explanation for observed variations in patient response when only grade and stage are considered during treatment decision-making.

In addition to providing outstanding patient care in the present, there are countless ways in which urologists can contribute to improvements in care. I (BTR) am grateful for support from mentors at UConn Health. In addition, programs through the AUA Office of Research such as the USMART academy and the Early Career Investigators workup are invaluable in extending mentorship networks and facilitating meaningful collaborations for discovery. Our team is committed to the ideal of precision medicine; more accurately matching treatment decisions and intensity to individual patient physiology and unique tumor biology will result in improved patient care and outcomes. ■

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AUA2023: REFLECTIONS

The Role of Poly (Adenosine Diphosphate-ribose) Polymerase Inhibitors in Advanced Prostate Cancer

Ashley E. Ross, MD, PhD

Northwestern Feinberg School of Medicine, Chicago, Illinois

Kristen R. Scarpato, MD, MPH

Vanderbilt University Medical Center, Nashville, Tennessee

Nancy B. Davis, MD

Vanderbilt University Medical Center, Nashville, Tennessee

At this year's AUA, Dr Ashley Ross, urologist at the Northwestern Feinberg School of Medicine, moderated a symposium on poly (adenosine diphosphate-ribose) polymerase (PARP) inhibitors (PARPi) with his colleagues, urologist Dr Kristin Scarpato and medical oncologist Dr Nancy Davis, from Vanderbilt University Medical Center. The symposium coincided with the AUA/Society of Urologic

Oncology (SUO) amended 2023 advanced prostate cancer guidelines that highlighted genetic testing and the role of PARPi in castration-resistant metastatic disease.

PARPi have been utilized in other malignancies such as breast and ovarian cancer for some time but only recently have been approved and guideline-endorsed as a treatment in selected men with metastatic castration-resistant prostate cancer (mCRPC).¹ PARPi are oral antineoplastics that inhibit PARP proteins that function in DNA repair. Inhibiting these proteins, particularly in cancers where homologous recombination repair is already compromised (ie, those lacking BRCA1 or BRCA2 function), can lead to catastrophic genomic instability

and cell death.² Homologous recombination repair deficiency is present in a significant minority of men with metastatic prostate cancer (roughly 12% at the germline level) and the AUA/SUO guidelines recommend germline genetic testing in all men with advanced prostate cancer and somatic testing in men with mCRPC.³

PARPi tested in late-phase clinical trials in prostate cancer include olaparib, rucaparib, niraparib, and talazoparib, with olaparib and rucaparib currently having Food and Drug Administration approval. PARPi in prostate cancer have been primarily reported on in mCRPC both as single-agent therapeutics (along with androgen deprivation) and in combinatorial regimens with androgen deprivation and andro-

gen receptor signaling inhibitors (ie, abiraterone and enzalutamide). The PROfound and TRITON trials⁴ investigated PARPi in men with mCRPC who had previously been treated with enzalutamide or abiraterone and with (PROfound, TRITON2)⁵ or without (PROfound, TRITON3)⁶ previous chemotherapy. These trials showed significant progression-free survival benefits for men with mCRPC who were biomarker-selected for harboring likely pathogenic or pathogenic mutations in BRCA1 or BRCA2. The updated AUA guidelines suggest that clinicians should offer PARPi to men with mCRPC and deleterious mutations in homologous recombination repair

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THE ROLE OF POLY (ADENOSINE DIPHOSPHATE-RIBOSE) POLYMERASE INHIBITORS IN ADVANCED PROSTATE CANCER

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genes following prior therapy with androgen receptor signaling or chemotherapy.

Androgen deprivation therapy can down-regulate cellular DNA repair and there may be added benefit to combining PARPi with androgen signaling agents. In an effort to expand the cohort of men with mCRPC who may benefit from PARPi, investigators have studied combining PARPi with abiraterone or enzalutamide in the MAGNITUDE,⁷ PROpel, and TALAPRO2⁸ trials. These trials also included men without homologous recombination repair deficiencies.⁹ The greatest benefit for PARPi combination was found in BRCA-mutated patients. Recently the Oncologic Drugs Advisory Committee to the Food and Drug Administration suggested that PARPi in combination

use should be limited to those men with BRCA mutations.

PARPi as a class share certain side effects, particularly anemia and gastrointestinal toxicity, and use can potentially, albeit rarely, lead to myeloproliferative disorders. Understanding PARPi toxicity and which individuals are more or less susceptible remains a needed area of further research. Some other areas of future research highlighted by the panel included understanding the role of PARPi in BRCA-mutated metastatic hormone-sensitive prostate cancer and exploring biomarkers that might better select non-BRCA-mutated men with deleterious gene mutations in DNA repair genes for PARPi therapy.

The symposium concluded with the panel reinforcing key points to

the audience. These included that (1) germline (if not performed earlier) and somatic DNA mutation testing should be a standard for patients with mCRPC, (2) over 10% of men with metastatic prostate cancer will have such mutations in their germline and even more in their somatic DNA, and (3) based on their favorable effect on progression-free survival, PARPi are now Food and Drug Administration-approved and AUA/SUO guideline-endorsed as a therapeutic option for men with mCRPC who have received prior therapies and harbor deleterious or likely deleterious homologous recombination repair gene mutations. ■

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AUA2023: REFLECTIONS

Innovation by Necessity: Improving Urodynamics for Children With Spina Bifida

Rafael Tua-Caraccia, MD

Duke University School of Medicine, Durham, North Carolina

Leonid I. Aksenov, MD

Duke University School of Medicine, Durham, North Carolina

Rebecca J. Fairchild, BS

Duke University School of Medicine, Durham, North Carolina

Jonathan C. Routh, MD, MPH

Duke University School of Medicine, Durham, North Carolina

Spina bifida (SB) is the most common permanently disabling neurological birth defect in the United States. Neurogenic bladder (NGB) is the most common urological sequela of SB, and NGB has been shown to increase a patient's risk of urinary tract infections (UTIs), pyelonephritis, hydronephrosis, and renal damage.^{1,2}

To prevent these adverse urological outcomes, clinicians rely on urodynamic testing (UDS) as part of effective SB management. UDS has been employed for decades to detect abnormal voiding and urine

storage patterns. More specifically, UDS is used to detect neurogenic detrusor overactivity (NDO), detrusor sphincter dyssynergia, and bladder noncompliance causing dangerously high bladder storage pressures.¹⁻³ UDS thus forms the basis of modern, proactive bladder management.¹ However, despite the seeming clinical importance of UDS, there are inconsistencies and significant heterogeneity in UDS performance and interpretation; these inconsistencies limit the utility of UDS in terms of management and predictive capacity of long-term urological outcomes.⁴ For example, despite high levels of UDS expertise across centers participating in the CDC-funded UMPIRE (Urologic Management to Preserve Initial RENal function) protocol study sites—which utilize a UDS-based risk stratification to determine medical management for infants with myelomeningocele—there was noted to be only 50% agreement with the initial local

UDS interpretation.⁵ As the cornerstone of NGB assessment, these variations in interpretations lead to life-altering changes in treatment of individuals with SB. The complexity of UDS data and inconsistency in interpretation make it an apt application for machine learning.

Machine learning is a data science technique in which models are iteratively trained to recognize complex patterns in data. There are many forms of machine learning, which can be alternatively referred to as artificial intelligence, deep learning, or multiple other similar techniques and concepts. Within urology, machine learning has been leveraged across a wide variety of topics, including urologic oncology, sexual health, UTI prediction and diagnostics, and imaging interpretation.^{6,7} Recent efforts by our group and others have established models that detect NDO or accurately categorize NGB risk categories with a reasonably high degree of accuracy.⁸⁻¹⁰ Although

machine learning models based on UDS data are viable, they have not yet been used to predict the most clinically relevant outcomes such as UTI, hydronephrosis, or, most importantly, renal damage. As such, our group has focused our recent efforts on using machine learning techniques to build more predictive models for the identification of UTI and hydronephrosis. As an exciting step in the right direction, we have recently shown that combining UDS and clinical data into merged models was found to perform better than clinical models alone, with the best models predicting worsening hydronephrosis noting an AUC of 0.70 (unpublished data).

These results are certainly promising, but much work still remains to be done before machine learning-based models are ready for day-to-day clinical use. Further potential applications such as integration of imaging data and bladder appearance,

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INNOVATION BY NECESSITY: IMPROVING URODYNAMICS FOR CHILDREN WITH SPINA BIFIDA

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standardization of compliance calculation metrics, and refinement of NDO definitions (for example, based on the amplitude of slope of the contraction curve) based on UDS variables will help to further define risk stratification based on both known and previously unrecognized UDS tracing data. Limitations also exist within machine learning models in general; a particularly fundamental limitation remains that most current UDS machine learning models are based on supervised learning techniques, where human judgment and interpretation are assumed to represent the “truth.” However, this is the exact same human judgment that we know to be problematic based on lack of consistency in UDS interpretation!⁴ Further, UDS

machine learning models are unable to account for what humans don’t know to look for, the so-called “unknown unknowns” of data science. Lastly, it is imperative to keep in mind what data inputs or variables are used in training these predictive models. The concept of “garbage in, garbage out” remains a fundamental truth of prediction modeling; in other words, if machine learning algorithms are trained on bad data, they are doomed to make bad predictions.

UDS, despite its shortcomings, remains our best tool to identify and prevent renal deterioration in NGB, particularly in children and adults with SB. However, UDS interpretation is not objectively reproducible, and it thus is in se-

rious need of improvement. Machine learning has the potential to help accomplish this goal by augmenting our understanding of UDS data and streamlining interpretation. While it is not yet ready for prime time, the future of machine learning in UDS is bright. Stay tuned. ■

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CODING TIPS & TRICKS

Modifier 24 and Modifier 25 Revisited: Definitions and Recommendations for Appropriate Use

Jonathan Rubenstein, MD
Chair, AUA Coding and Reimbursement Committee

When can one report an Evaluation and Management (E/M) code on the same day as a procedure defined by a Current Procedural Terminology (CPT) code that has a global period? And when is an E/M code reportable within the postoperative global period of a 10- or 90-day global procedure? These are 2 questions which are vexing to many, yet important to understand to allow appropriate reimbursement of services provided without running into trouble with regulators. While always important, these questions have recently come under greater scrutiny due to the concern and risk of overutilization along with an increase in audits and even prepayment audits from insurers. There are those who have been accused of fraudulent billing by either consciously evading the rules or not knowing the rules; as one may be aware, the litmus test of proper billing is that providers should have known the rules before seeking reimbursement for services.

The first step in this process is understanding what has already been

paid when reporting a CPT code. Once that is known, one can then determine if an E/M code can additionally be reported. The valuation of a CPT code includes the associated same-day preprocedural work (seeing and examining the patient, preparing the patient for the procedure, getting consent, ordering medications, etc), the intraprocedural work (performing the procedure itself), and the associated postprocedural work. The postprocedural work that has been valued already is the associated postoperative work on the same day for 0-day global procedures, and for the next 10 or 90 days for a 10- or 90-day global procedure, respectively. Postoperative work includes writing orders, talking to the patient and family, coordination of the patient’s care, hospital and office visits, prescribing medications, changing lines and catheters and dressings, and typically the management of any complications of the procedure managed outside of a designated procedure/operating room.

Therefore, to additionally report an E/M service, one would have to perform medically neces-

sary and indicated yet separate and identifiable work from that of the procedure that is being performed and its associated work, appended with the appropriate modifier. These rules apply not only to our surgical procedures (radical prostatectomy, cystoscopy, etc), but also to nearly any procedure with a designated CPT code that has a global period. In urology, this includes even seemingly minor procedures, including intramuscular injection (CPT 96372), intravenous infusion (CPT 96374), bladder instillation of anticarcinogenic agent (CPT 51720), insertion of temporary indwelling bladder catheter (CPT codes 51702 and 51703), and the like. Misunderstanding of the reporting criteria and/or misuse of coding can lead to denials and take-backs, and even up to being accused of fraudulent billing.

So let’s take a deeper look at Modifiers 24 and 25. Please note that coding is often based upon interpretation, and the examples listed below are opinion and what are felt to be best practices based upon the modifier descriptor definition,

but do not constitute legal advice.

Modifier 24: Unrelated E/M Service by the Same Physician/Other Qualified Health Care Professional During a Postoperative Period

Modifier 24 appended to an E/M service communicates to an insurer that the provider is seeing and managing a patient for an unrelated reason within a 10- or 90-day postoperative global period. An E/M service appended with Modifier 24 should only be reported when appropriate criteria are met. As noted above, the global period of a procedure includes the work performed as related to the procedure and the recovery from the procedure, including inpatient and outpatient visits and visits with different diagnoses that are actually complications of the procedure performed. What is

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MODIFIER 24 AND MODIFIER 25 REVISITED: DEFINITIONS AND RECOMMENDATIONS FOR APPROPRIATE USE

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not included in the CPT code and global is the evaluation and management of unrelated diagnoses, management of the underlying condition, or an added course of treatment which is not part of normal recovery from surgery.

Appropriate use: It would be appropriate to report an E/M service within a global period if the patient is being seen for an unrelated reason during a 10- or 90-day global postoperative period. For example, if 30 days after a laparoscopic radical prostatectomy (CPT code 55866, 90-day global procedure) a patient presents with a new obstructing ureter stone, the evaluation and management of that condition should be noted and the E/M service reported with Modifier 24. It is important to remember that all providers in the same practice and specialty are considered the same provider; the same rules apply if a patient is on the schedule to see one of the partners of the provider who performed the procedure. It would be appropriate if a patient needs further care on their underlying condition (think: managing chemotherapy or radiation therapy for cancer) within a global period.

Inappropriate use: It would be inappropriate to report an E/M code with Modifier 24 for routine postoperative care or for managing a surgical complication such as infection, removal of sutures, or other wound treatment, as these treatments are already part of the surgery package and have been “prepaid.” For example, if a patient needs to be seen for a wound infection and gets antibiotics or even some in-office local therapy, that is all included even if a different diagnosis code is used. Another example: the patient has urinary retention after a 90-day global procedure such as a hydrocelectomy (90-day global) if the patient had not previously had known urinary retention issues and the problem is a side effect of the surgery or anesthesia.

Modifier 25: Significant, Separately Identifiable E/M Service by the Same Physician/Qualified Health Care Professional

on the Same Day of the Procedure or Other Service

Modifier 25 appended to an E/M service communicates to an insurer that the provider is seeing and managing a patient for a separately identifiable reason on the same day as a procedure. An E/M service appended with Modifier 25 also should only be reported when appropriate criteria are met. Procedures performed are already valued to include the preoperative work and all of the associated postoperative work of that designated procedure. When determining if it is appropriate to report an E/M service using Modifier 25, one has to ask if there are unrelated conditions that are also being addressed (and medically necessary to do on the same date) or if there signs, symptoms, and/or conditions the physician/other qualified health care professional must address before deciding to perform a procedure or service. One does not need to have different diagnosis codes to report an E/M service with Modifier 25 as long as the appropriate criteria are met.

Appropriate use: A classic example of appropriate reporting of an E/M code on the same day as a procedure is a patient undergoing a microscopic hematuria evaluation by cystoscopy (CPT code 52000, 0-day global) where a bladder tumor is found. If the provider then discussed this finding along with the next steps (such as scheduling the patient for a bladder tumor resection), a separate and identifiable E/M service is performed. In this example, different diagnosis codes are used. Another example of the appropriate use of Modifier 25 is when one sees and examines a new patient in the emergency room who is presenting with a ureter stone and scheduling the patient for a cystoscopy with stent placement (CPT code 52332, 0-day global procedure) on the same day. Please note that even though the same diagnosis code (N20.1 ureter stone) is used for both the E/M service and procedure, it is the extra work above and beyond that allows billing of the E/M code as this was the evaluation that led to the decision to perform surgery. This

is in contrast to a patient who had been seen in the office with a ureter stone on a prior day and presented for an elective cystoscopy with stent placement, when no E/M service would be billed.

Inappropriate use: One should not report an E/M service using Modifier 25 on the same day as a procedure if there are no new medically necessary E/M services provided. For example, a patient presents for a 6-week course of intravesical therapy for bladder cancer. For each of the 6 visits, the procedure code (CPT code 51720) is a 0-day global, and since the plan is already in place, no separate and identifiable E/M service is performed. Talking to the patient preprocedure, viewing the patient’s urine, and ensuring that the patient is safe to undergo the procedure are all valued into the CPT code. Similarly, patients who are on a course for surveillance cystoscopies should not have an E/M service reported on the dates of the

cystoscopy without a different reason. It would be inappropriate to report an E/M service using separate and unrelated diagnoses on the same day as a procedure if it was not medically necessary to do so (for example, if it was just recently discussed or irrelevant, etc). As medical necessity is the overarching criterion to report services, it would be inappropriate to additionally manage a condition that was not medically necessary on the same date as a procedure merely to additionally report an E/M service.

Conclusions

Modifier 24 and Modifier 25 are important E/M modifiers but must be used with caution as there is a high risk of audit when these codes are used. A thorough understanding of the appropriate and inappropriate uses of these codes is vital to appropriate reporting and reimbursement for work performed. ■

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SPECIALTY SOCIETIES

Association of the Bladder with Endometriosis Emphasized at the Endometriosis Summit

Sallie Sarrel, PT, ATC, DPT (she/her/hers)
Director and Co-Founder, The Endometriosis Summit

In honor of Endometriosis Awareness Month, surgeons, practitioners, and patients invaded Celebration, Florida, for the fifth annual The Endometriosis Summit (Figure 1).

Endometriosis is a chronic and debilitating condition affecting nearly 200 million worldwide. The average person with the disease can seek help for 8-10 years prior to receiving diagnosis. While symptoms can include painful periods and miscarriage, endometriosis is not solely a gynecological disorder. Many with the disease report bloating, urinary urgency, urinary frequency, chronic urinary tract infection (UTI)-like pain, flank pain, stomach issues, lower back pain, and leg pain. As part of its mission to drive endometriosis forward, The Endometriosis Summit designs programming to educate multiple specialties on the intricacies of the disease beyond gynecology and on the multiple drivers of pain.

Dr Yaniv Larish, a urologist from New York, Dr Maurice Chung, a urogynecologist from West Virginia, Dr Michael Watters, a urologist from Texas, and Dr Tracy Sher, a physical therapist from Florida were faculty for Bladder Hour, a panel discussing bladder and bladder-driven pain.

During the didactics section, Dr Larish discussed urological evalua-

tion for endometriosis. Dr Larish is part of a multidisciplinary surgical center for endometriosis (Figure 2). His team consisting of a urologist, a gynecologist, and a general surgeon is designed to tackle the nuances of endometriosis from every angle. “The majority of endometriosis patients will have involvement far beyond their reproductive system. It takes a multispecialty approach to fully eradicate the disease and give patients back the life they deserve. Endometriosis is a disease treated by surgery that requires skilled specialty surgeons capable of treating the disease wherever it is in the body.”

Dr Larish’s lecture stressed the importance of motivational interviewing during intake. Understanding when a person’s bladder hurts can tip off the urologist as to what is going on with the patient. “Urologists will see endometriosis patients. If you see a patient under 50 complaining of bladder pain, endometriosis should be part of the differential. We should normalize asking when the bladder hurts because pain with a full bladder that is not relieved by emptying or where that full bladder triggers a full-blown flare could be endometriosis.”

Dr Maurice Chung, the founder of the evil twins of pelvic pain, also spoke. Dr Chung is known for his work with overactive bladder and endometriosis. Ongoing pain post complete excision of endometriosis can often be traced back to the sen-



Figure 2. Dr Yaniv Larish demonstrates techniques for relieving chronic bladder pain and overactive bladder in the person with endometriosis.

sory driver of the pelvis—the bladder. Dr Chung, who has created a pelvic pain center in West Virginia, teaches that all that ails the person with endometriosis may not actually be endometriosis. At The Endometriosis Summit, he presented research on the connection to the bladder through sacral nerves S2, S3, and S4 that amps up pain in the person with endometriosis. He also described a protocol for treating postexcision of endometriosis pain that involved

bladder instillations and nerve blocks. According to Dr Chung’s research, if a person has had a complete excision of the disease and is still experiencing pain, it is imperative to consider the nerves including the pudendal and ilioinguinal nerves and the bladder as drivers of pain.

In a unique presentation, Dr Michael Waters discussed bladder pathogens. Oftentimes people have UTI symptoms or have recurrent UTIs but the urine culture is negative. Using DNA diagnostic testing to sequence the urine sample may reveal microbes that are generating the infection and pain. Dr Waters spearheaded a fascinating discussion on bladder microbes in patients who have pets and the importance of asking about lifestyle and living arrangements in the person with chronic bladder pain.

Rounding out the panel was Dr Tracy Sher, a pelvic physical therapist. In addition to her practice, Sher Pelvic, Dr Sher owns



Figure 1. The Endometriosis Summit 2023 in Celebration, Florida.

ASSOCIATION OF THE BLADDER WITH ENDOMETRIOSIS EMPHASIZED AT THE ENDOMETRIOSIS SUMMIT

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Figure 3. Tracy Sher, PT, DPT, illustrates pelvic physical therapy considerations for the bladder.

thepelvicguru.com and is founder of the Global Pelvic Health Alliance Membership network, which is an international directory and educational entity for all working in pelvic pain. Dr Sher discussed the role of the pelvic floor in bladder pain and also the importance of manual therapy to the bladder and the fascia (Figure 3).

Dr Larish rounded out the bladder session with a hands-on simula-

tion lab demonstrating techniques to treat overactive bladder.

The Endometriosis Summit, founded by Dr Andrea Vidali, a gynecologist, and Dr Sallie Sarrel, a pelvic physical therapist and person with endometriosis, is unique in its endometriosis education. In addition to training surgeons, physical therapists, and practitioners, The Endometriosis Summit believes that if change is

to happen in endometriosis it is going to be patient-driven. People with endometriosis are often thrust into a position to advocate for themselves due to the lack of access to skilled endometriosis care and the myths and misconceptions about the disease that are all too common. The Endometriosis Summit opens its doors to patients and caregivers to help educate and arm people with the knowledge they need and create a dialogue between those working in endometriosis and those living with endometriosis. Sessions at The Endometriosis Summit are open to patients and most sessions, either virtual or in-person, have open mics in order to facilitate discussion about the disease. In addition to the bladder panel, other highlights of the conference included a keynote by Representative Jillian Gilchrest about her work to advance endometriosis care and education in the state of Connecticut and a discussion on body literacy and menstruation by Dr Chris Bobel, a sociologist. There was a breakout session on heart rate variability and sleep's role in chronic pain by Dr Susan Clinton. Dr Lila Abbate greeted the crowd with a discussion about how the foot can play into pelvic pain and Laura Fletcher, of Selah Fertility, headed a miscarriage support room.

Given Dr Sarrel's background in physical therapy, another goal of The Endometriosis Summit is to

“The Endometriosis Summit opens its doors to patients and caregivers to help educate and arm people with the knowledge they need and create a dialogue between those working in endometriosis and those living with endometriosis.”

take a deep dive into all the generators of pain someone with endometriosis might experience and to hold space to explore not only how to change endometriosis for the next generation but how to live well with the disease.

The Endometriosis Summit 2024: Hear Us Roar will take place March 8-10, 2024, during Endometriosis Awareness Month and feature a preconference course of didactics and labs for urologists. For more information, please email info@theendometriosisummit.com or follow @endometriosisummit on Instagram, Facebook, Tic Tok, or Youtube. ■

MEDICAL STUDENT COLUMN

Phosphodiesterase-5 Inhibitors: Does Evidence Support Prospective Trials of a Role Outside Urology?

Yash B. Shah, BS

Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania

Robert Glatter, MD

Zucker School of Medicine, Hofstra University/ Northwell Health, New York, New York

A recently published article in *The Journal of Sexual Medicine* investigating the associations between phosphodi-

esterase-5 inhibitor (PDE-5i) use and major adverse cardiovascular events has piqued the interest of/sparked debate within the urology community.¹ The observational study, capturing a sizable population of over 23,000 patients receiving PDE-5i, found that major adverse cardiovascular events, a metric which incorporates cardiovascular mortality,

hospitalization, stroke, coronary revascularization, heart failure, unstable angina, and overall mortality, was 13% lower with PDE-5i exposure. Impressively, overall mortality actually fell by 25%.¹ Interestingly, patients with higher exposure, based on dosage or length of prescription, demonstrated greater benefits from these drugs. The researchers per-

formed further subanalyses to uncover possible effect modification, finding that patients with preexisting cardiovascular risk factors and type 2 diabetes mellitus experienced similar improvements. However, known coronary artery disease seemed to negate the benefits of PDE-5i.

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PHOSPHODIESTERASE-5 INHIBITORS

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Hence, PDE5-i exposure may primarily offer preventive benefits.

Although this retrospective study certainly has limitations, the authors write that these findings confirm several earlier studies suggesting that PDE-5is offer impressive benefits for patients with erectile dysfunction surrounding several cardiovascular conditions. Yet this study goes beyond previous perspectives to demonstrate benefits over a longer time period and in a broader population, including men without preexisting cardiovascular risk factors.

Perhaps most interesting is that PDE5-is, traditionally viewed as treatments exclusively for erectile dysfunction, may be soon considered for indications outside the realm of urology, harkening back to their historical early days in angina research. Beyond cardiovascular disease, there are additional studies investigating their use in diabetes, chronic kidney disease, and Raynaud's phenomenon. Specifically, literature suggests the potential for PDE-5is to reduce the metabolic, microvascular, and macrovascular complications associated with diabetes.² In chronic kidney disease, PDE-5is enhance NO-cGMP signaling leading to renal protective effects, potentially attributable to anti-inflammatory, antioxidant, and antiproliferative mechanisms. In Raynaud's phenomenon, PDE-5is represent a vi-

“Perhaps most interesting is that PDE5-is, traditionally viewed as treatments exclusively for erectile dysfunction, may be soon considered for indications outside the realm of urology, harkening back to their historical early days in angina research.”

able approach to improving microcirculation through vasodilation and enhanced endothelial function.³ Through their effects on intracellular signaling, PDE-5is may also have benefit in patients with hematological, breast, colorectal, and prostate malignancies.⁴ Their role as immunomodulators suggests that further investigations would be advisable to consider their use in conjunction with novel checkpoint inhibitors.⁵

Importantly, though PDE-5is may share a core mechanism of action, individual compounds hold significant pharmacological differences, particularly in potency, selectivity, and duration of action. They also hold unique drug interactions or implications for other patient comorbidities. Hence, further studies are needed to clarify the best pharmacological options for various indications in a patient-specific manner. The uncertainty surrounding the safety profile of PDE-5is and the importance of careful patient selection are evidenced by a case series demonstrating drug-induced nonarteritic anterior ischemic neuropathy leading to painless visual loss in PDE-5i users. Thus, prior episodes of nonarteritic anterior ischemic neuropathy or hereditary eye disease should be regarded as contraindications for their use.^{6,7} Although this is but one, low-powered finding, it invites caution in exploring the expansion of these drugs. Given the broad physiological effects of these drugs throughout the body, prospective controlled studies are becoming warranted as early signals of benefit and safety become clearer.

At this point, consistent retrospective signals have suggested that PDE-5is may improve men's cardiovascular health, and early studies have proposed uses far outside this space as well. The most robust findings certainly surround cardio-

vascular indications, and as data continue to accumulate, there may be increasing support for organizing prospective randomized controlled trials which offer adequate power to further clarify the use of these drugs in improving patient care. This is an exciting time for pharmacology and urology as a mainstay drug offers potential in a variety of conditions that affect a wide swath of our population. Ultimately, prospective randomized clinical trials examining the cardioprotective role of PDE-5is are warranted. ■

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Ureteral Injuries After Blunt External Trauma: How to Diagnose, Grade, and Treat a Rare Injury

Delaney J. Orcutt, MD

Vanderbilt University, Nashville, Tennessee

Alexander J. Skokan, MD

University of Washington, Seattle

Ureteral injuries secondary to blunt mechanism external trauma are very rare and can present significant challenges related to diagnosis and management for the practicing urologist. Ureteral injuries represent 1%–2.5% of urological injuries from external trauma, with a small minority of these being due to blunt mechanisms.^{1,2} The AUA

Urotrauma Guidelines provide a guiding framework for acute evaluation and management, but the stakes can be high with such a rare condition.³ A variety of challenging clinical scenarios can yield uncertainty regarding the optimal tools for diagnosis, and clinicians are tasked with complex management decisions based upon limited existent outcomes data. Delay in diagnosis can yield adverse events ranging from complex retroperitoneal collections and infections to the need for nephrectomy.⁴ Con-

temporary data from the National Trauma Data Bank suggest prevalent use of minimally invasive ureteral stenting even in cases where the guidelines would recommend early surgical repair, highlighting continued uncertainty regarding how best to manage these rare injuries.⁵ We recently reported on our 15-year experience at a large regional level 1 trauma center with the diagnosis and acute management of blunt mechanism ureteral injuries, and the insights from this work can serve to better equip

the urologist encountering these rare and difficult cases.⁶

At our institution, hemodynamically stable blunt trauma patients undergo cross-sectional CT urography (CTU) imaging according to AUA Urotrauma Guidelines (indications include gross hematuria, microscopic hematuria with systolic blood pressure <90 mm Hg, and mechanism suspicious for renal/ureteral injury). CTU imaging is used to differentiate American Association

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URETERAL INJURIES AFTER BLUNT EXTERNAL TRAUMA

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CT Urogram of Blunt Ureteral Injury



Figure. Contrast-enhanced delayed phase imaging of a 47-year-old female who sustained complete ureteral transection injury (American Association for the Surgery of Trauma grade 4) of the right ureteropelvic junction after motor vehicle vs pedestrian trauma. A, Contrast extravasation from the right ureteropelvic junction is seen. B, Contrast opacification of the distal left ureter is seen with no contrast opacification of the distal right ureter.

for the Surgery of Trauma (AAST) grade II-III partial ureteral transections (urinary contrast extravasation on delayed phase images with intraluminal contrast reconstitution distal to the injury site) from AAST grade IV-V complete transections (urinary contrast extravasation with no intraluminal opacification distal to the injury site), as illustrated in the Figure. In the case of unstable patients requiring emergent laparotomy, our practice is to defer complete ureteral diagnostic evaluation at the time of initial laparotomy in most cases (other than those injuries readily exposed and where intraoperative stabilization has been achieved), and to pursue diagnosis and grading with CTU early postoperatively or with retrograde fluoroscopic studies at patients' second-look laparotomy within 24 to 48 hours. This approach is based on prior limited case series and surgeon experience indicating the limited sensitivity of direct retroperitoneal inspection for ureteral or ureteropelvic junction injuries.⁷

In our study, there were 18 patients with AAST grade II-V blunt ureteral injuries, including 1 patient with bilateral complete tran-

section injuries (19 total ureteral injuries). Trauma mechanisms were uniformly related to road traffic accidents (motor vehicle collision, motorcycle crash, pedestrian vs automobile) or falls from height, and there were 10 partial and 9 complete transection injuries. Patients demonstrated severe global injury burden with a median Injury Severity Score of 34 and associated major nonurological organ injuries in over 90% of cases. Most injuries were localized to the ureteropelvic junction or proximal ureter, including 10/10 partial transection injuries and 8/9 complete transections. Cross-sectional imaging appeared to be a sensitive diagnostic modality for blunt ureteral injuries, correctly diagnosing and accurately grading 16/16 patients who underwent a CTU; the remaining 2 patients (1 with unilateral, 1 with bilateral injuries) were accurately diagnosed at second-look laparotomy without preceding cross-sectional delayed phase imaging.

Among 9 partial injury patients who survived to early definitive management, 7 were managed conservatively with either close observation or minimally invasive ureteral stent

placement and 2 underwent open surgical repair. All 7 conservatively managed patients and 1/2 surgically managed patients had no evidence of obstruction at a median of 9 months of follow-up. Among 9 complete ureteral transections (7 patients with unilateral injury and 1 with bilateral injuries), all underwent early operative repair including 8 undergoing primary anastomotic repair (pyeloplasty, ureteroureterostomy, or ureteroneocystostomy) and 1 requiring nephrectomy due to hostile postinjury factors precluding reconstruction. Seven of 8 ureteral units undergoing anastomotic repair had no evidence of obstruction at a median of 32 months of follow-up.

These findings support the use of CTU as a sensitive diagnostic tool in cases of suspected blunt ureteral trauma, and further support its value in accurately grading injuries to guide management based on ureteral injury severity. We would advocate early minimally invasive retrograde drainage with ureteral stent placement in cases of confirmed partial thickness injury. In the case of a critically ill patient who cannot tolerate early intervention under general anesthesia, close observation with repeat cross-sectional delayed phase imaging can be obtained within 48-72 hours to evaluate for spontaneous resolution of urinary contrast extravasation; it is our opinion that the urologist should remain vigilant for persistent urine leak and should be ready to place a retrograde ureteral stent in such cases. Some patients may require additional early operative intervention where retroperitoneal exposure would not entail significant additional risk (such as second-look laparotomy), and in these cases we would still consider open repair of an exposed partial transection injury. Complete ureteral transections merit early primary reconstruction once patients are stabilized. Despite the prevalence of extremely high-energy trauma underlying blunt mechanism ureteral injuries, urologists can achieve a successful functional outcome for most patients through timely diagnosis, accurate injury grading, and early utilization of appropriate minimally invasive (in the case of AAST grade II-III partial transection) or

“In the case of unstable patients requiring emergent laparotomy, our practice is to defer complete ureteral diagnostic evaluation at the time of initial laparotomy in most cases (other than those injuries readily exposed and where intraoperative stabilization has been achieved), and to pursue diagnosis and grading with CTU early postoperatively or with retrograde fluoroscopic studies at patients' second-look laparotomy within 24 to 48 hours.”

open surgical (AAST grade IV-V complete transection) techniques. ■

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AUA2023: REFLECTIONS

Time Efficiency and Productivity Hacks for the Busy Urologist

Angela Smith, MD, MS

University of North Carolina at Chapel Hill

David Canes, MD

Lahey Clinic, Burlington, Massachusetts

Jennifer Miles-Thomas, MD, FPMRS

University of Virginia, Virginia Beach

Rena Malik, MD

University of Maryland School of Medicine, Baltimore

Time efficiency is a critical skill to achieve success and fulfillment regardless of training level or practice type. At the inaugural AUA2023 leadership and business track, we conducted an interactive session covering 4 pillars of time efficiency in medicine: email management, electronic health record optimization, daily/weekly planning, and habit formation (see Figure).

For email management, Dr Smith emphasized the importance of a minimal number of functional folders, typically arranged chronologically by events (meetings, travel, conferences) and deadlines; and then stressed the importance of intention in setting the time and frequency

of email checks while challenging participants to turn off email during vacation. In the electronic health record module, Dr Canes brainstormed ways to reduce administrative burden—in particular, making use of templates and order panels while also considering outsourcing time-intensive activities such as precharting. Following this discussion, Dr Miles-Thomas provided a framework for daily planning and prioritizing, outlining a very simple method of drafting 2 items in order of priority that must be done the following day—and then beginning the next day with that plan in mind. Finally, Dr Malik addressed the importance of these elements in the context of well-being—using habits to prioritize self-care, including sleep, passion projects, and a variety of other activities that boost our energy and efficiency, allowing us to get more done in less time.

The session ended with an engaged discussion with the audience, in which participants asked insightful questions while also sharing use-



Figure. AUA2023 time management course. Left to right: David Canes, Rena Malik, Jennifer Miles-Thomas, Angela Smith.

“Time efficiency is a critical skill to achieve success and fulfillment regardless of training level or practice type.”

ful tips and tricks from their own experience. We encourage you to listen on demand to this high-yield session if you are struggling with finding time for yourself and your personal life. Course worksheets (available online) provide a custom-made time management program that can be immediately implemented to up-level your life in medicine. ■

Point-of-care Ultrasound in Urology and Urological Training

Wilson Sui, MD

University of California, San Francisco

Thomas Chi, MD, MBA

University of California, San Francisco

Since ultrasound was first used to identify a renal stone as a “blip” on the monitor in 1961,¹ rapid technological development has led to improved image quality with smaller and less expensive equipment. The net result has been increased accessibility to high-quality imaging. As a noninvasive and portable imaging modality, point-of-care ultrasound (POCUS) technology enables providers to perform real-time imaging in a variety of patient settings including outpatient clinics, emergency de-

partments (EDs), and inpatient floors (see Table). Eliminating a separate encounter for a formal radiology ultrasound during outpatient follow-up

“Expertise with POCUS empowers providers to reach beyond simply diagnosing acute conditions to enabling procedural intervention as well.”

of nephrolithiasis or decreasing the wait time in the emergency department for imaging assessment can lead to fewer missed appointments and faster time to diagnosis. POCUS has grown in popularity as it allows rapid and accurate diagnostic information at the bedside. The objective of this article is to review the applications of POCUS for urologists in a variety of clinical contexts.

Diagnosis to Disposition: POCUS in the ED

For patients presenting with acute flank pain to the ED, the choice of the initial imaging modality has been a topic of ongoing debate as

the harms of repeated ionizing radiation exposure must be weighed against the sensitivity and specificity of the imaging test. A large, multicenter, comparative effectiveness trial randomized patients presenting to the ED with flank pain to POCUS, radiology ultrasound, or CT for initial imaging.² Patients who underwent POCUS had shorter ED stays. Between the 3 treatment arms, there were no differences in adverse events, return ED visits, or diagnostic accuracy. Secondary analysis of these data demonstrated that ultrasound did not delay appropriate definitive stone intervention

POINT-OF-CARE ULTRASOUND IN UROLOGY AND UROLOGICAL TRAINING

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and 25% of patients were able to avoid ionizing radiation altogether in their care pathway.³ In addition, this technology has also been leveraged for rapid identification of time-sensitive diagnoses (see Table) such as testicular torsion⁴ or emphysematous pyelonephritis.⁵

Expertise with POCUS empowers providers to reach beyond simply diagnosing acute conditions to enabling procedural intervention as well. Relief of acute ureteral obstruction with a retrograde ureteral stent is most often performed in the operating room under general anesthesia. During the COVID-19 pandemic when operating room access was limited, our group was able to leverage familiarity with POCUS to perform this procedure safely at the bedside. Patients in both the ED and the inpatient floor were given oral or intravenous premedication and local urethral analgesic. Most procedures lasted less than 30 minutes and 88% of the patients had stents successfully placed. In all cases, live ultrasound was used to verify wire access and location and a postprocedure abdominal plain film confirmed stent placement.⁶ POCUS facilitates new safe and expeditious ways for physicians to bring procedures to patients.

Outpatient POCUS: Keeping the Patient in Focus

Ultrasound is often utilized in outpatient care for the management of nephrolithiasis, as it allows for the monitoring of patients during a trial of passage, postoperative imaging, and long-term surveillance. Typically, such follow-up imaging is obtained before the clinic visit and performed at a separate encounter by a trained sonographer. These additional appointments lead to missed visits or late cancellations. A study by colleagues at the University of Washington showed that in-office ultrasound led to a change in management in 33% of visits based on the information. In the study period of over 31 days, 34 patients cancelled their visits as planned imaging had

not been obtained.⁷ Another study in pediatric urology evaluating POCUS for postoperative imaging after pyeloplasty showed no difference in detecting changes in hydronephrosis when comparing POCUS to a radiology-performed ultrasound.⁸ The authors estimated 2 hours saved per health care encounter and \$83,000 less charges to payers. The portability and flexibility of POCUS lends itself to a wide range of use cases in the outpatient arena (see Table).

Not Just a Bunch of Hocus POCUS: The Use of Ultrasound in Resident Education

Ultrasound technology is becoming more accessible and common in medical training. Residents are gaining earlier exposure to the technology and developing greater proficiency in its use. During internship, many trainees may first be exposed to ultrasound use in central or arterial line placement. Then during dedicated urology training, residents often build on this initial experience. For example, urology residents at the University of California, San Francisco, have access to the Clarius handheld ultrasound that connects via Blue-

“POCUS has become an increasingly important tool in urology, providing quick and accurate diagnostic information at the bedside in a range of clinical settings.”

tooth to their cellular devices. The team has used this during rounds or on-call to assess situations such as evaluating clot burden during a bedside clot evacuation for gross hematuria, placement of suprapubic catheters, or monitoring of hy-

Table. Examples of Utilizing Point-of-care Ultrasound in Various Clinical Settings

Inpatient or emergency department diagnosis of:

- Acute nephrolithiasis^{2,3}
- Testicular torsion⁴
- Emphysematous pyelonephritis⁵
- Emphysematous pyelitis
- Lower urinary tract foreign bodies
- High vs low flow priapism
- Bladder diverticulum vs high postvoid residual urine
- Infected urachal cyst or other pelvic/abdominal abscesses
- Assessment of hydronephrosis to determine need for urinary diversion

Outpatient uses

- Follow up of nephrolithiasis⁷
- Postop evaluation of hydronephrosis in children after pyeloplasty⁸
- Evaluation of prostate size and morphology
- Screening for renal cell carcinoma during hematuria workup
- Evaluation of erectile dysfunction

Procedural interventions

- Placement of retrograde ureteral stent⁶
- Placement of suprapubic catheters
- Evaluation of clot burden during bedside clot evacuation

dronephrosis to inform decisions for urinary diversion.

There has been growing interest in formally introducing this technology to our trainees. The McMaster University urology program published their experience with a resident-focused introductory program on POCUS and demonstrated that a short, inexpensive, and guidelines-based course led to significant improvements in theoretical knowledge and skill confidence.⁹ Another group described their experience with integrating a POCUS curriculum as early as the first year of medical school.¹⁰ Early and standardized exposure to and training in POCUS empowers trainees not only during residency but has an impact on graduates as they move into practice. In the previously described manuscript by Villanueva et al, exposure to POCUS in residency allowed 3 urologists to use POCUS in over 50% of visits while the urologist with no exposure during training utilized POCUS in only 5%.⁸

POCUS has become an increasingly important tool in urology, providing quick and accurate diagnostic information at the bedside in a range of clinical settings. The use of POCUS has been shown to be feasible and effective in emergency departments, outpatient clinics, and in resident education, improving patient care while reducing the need for additional

imaging procedures and delays in treatment. As ultrasound technology continues to advance and become more accessible, its use in urology and urological training is likely to continue to grow and play an even more significant role in patient care. ■

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AUA2023: REFLECTIONS

Hands-on Percutaneous Nephrolithotomy Skills Course

Robert M. Sweet, MD, FACS,
MAMSE
University of Washington, Seattle

The inception of a hands-on percutaneous nephrolithotomy (PCNL) skills course as a 4-hour “short course” at the annual AUA conference with a series of more in-depth regional day and half-day courses happened through a series of phone meetings and emails with Dr Ralph Clayman, Dr Jaime Landman, Dr Arthur Smith, Dr David Hoenig, me, and the AUA staff throughout 2014. Building on this strong foundation, the course has continued to be relevant and adaptable to needs around the skillset for PCNL throughout the years. At AUA 2023, 45 attendees chose to advance their skill set for percutaneous renal access at our tips and techniques course this year (Figure 1). Thoughtful synchronization and coordination with Dr Thomas Chi’s morning course on advanced ultrasound techniques provided a full day of synergistic hands-on learning opportunities. The first hour of the afternoon course was highlighted by an outstanding lecture from Dr Duane Baldwin (Loma Linda, California) reminding us of the dangers of radiation and providing us with practical strategies for minimizing its use during PCNL. This was followed by a thoughtful lecture by Dr Benjamin Canales (University of Florida [Gainesville]) empowering the learners with preoperative decision-making principles and guidelines for case and access site selection. Dr Nicole Miller (Vanderbilt) introduced positioning considerations and mini-PCNL equipment and techniques which continue to steadily gain traction in the literature and in our practices. I provided a lecture on steps and tips for fluoroscopic access and endoscopic combined intrarenal surgery and Dr Thomas Chi (University of California, San Francisco) provided the complementary skill set for ultrasound-guided access techniques. Dr Zeph Okeke (Northwell) rounded out the lectures by providing a review of exit



Figure 1. Faculty and course participants at the 2023 AUA hands-on percutaneous nephrolithotomy course.



Figure 2. Dr Chi and course attendees learn hands-on renal ultrasound access techniques.



Figure 3. Dr Duane Baldwin and course attendees learn hands-on fluoroscopic-guided renal access techniques.

strategies and complications with tips on how to avoid them.

This year, we provided 2 full hours of proctored hands-on learning opportunities with 4 skills stations. The Chi/Sur butcher model provided an opportunity to hone in on ultrasound renal visualization and access skills (Drs Okeke, Chi, and Raskolnikov; Figure 2). The Simagine fluoroscopy C-arm trainer facilitated the attendees’ ability to successfully acquire and demonstrate the skills necessary for fluoroscopic-guided renal access (Drs Baldwin, Hoenig, and Leavitt; Figure 3). The Simagine ECIRS Ease models provided a hands-on opportunity to practice the coordination and communication skills necessary to obtain through-and-through access with a combined retrograde-antegrade approach to dealing with complex or large stones (Chang, Canales, Sweet; Figure 4) and the University of Washington CREST nephrolithotomy models allowed learners to get introduced to mini-percutaneous instrumentation and techniques (Drs Miller, Knudsen, and Metzler; Figure 5). We rounded out the course with a town hall/panel of difficult PCNL case presentations by Drs Ian Metzler (University of

HANDS-ON PERCUTANEOUS NEPHROLITHOTOMY SKILLS COURSE

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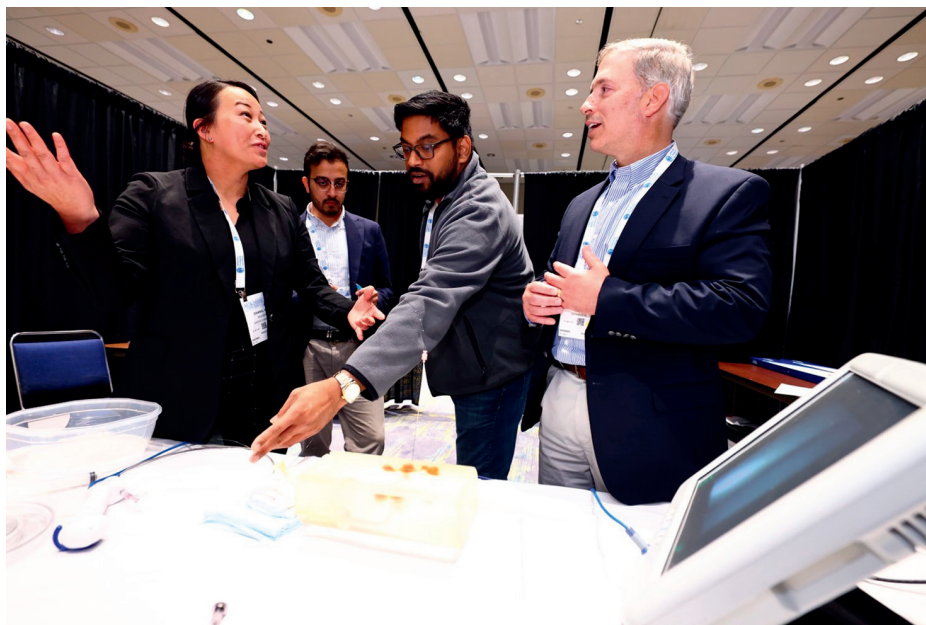


Figure 4. Dr Helena Chang and course attendees learn hands-on tricks for performing endoscopic combined intrarenal surgery.

California, San Francisco) and Helena Chang (Kaiser Permanente San Francisco) that highlighted the utilization of all the skills/techniques learned during the course. Our vibrant faculty were energized by our enthusiastic learn-

ers this year as there seemed to be a transition from exploration to motivated implementation. Learners were noted to have more baseline skills than in years past and came in with very targeted learning goals that were met by the course. We



Figure 5. Dr Ian Metzler with course attendees learning hands-on mini-percutaneous nephrolithotomy techniques.

anticipate that the course will continue to contribute to the trend of urologists safely, successfully, and skillfully performing their own percutaneous access which has been shown to improve outcomes in patients undergoing PCNL.^{1,2} ■

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Conservative Management of Lichen Sclerosus–Induced Urethral Stricture Disease

Marcus L. Jamil, MD

Lahey Hospital and Medical Center, Burlington, Massachusetts

Alex J. Vanni, MD, FACS

Lahey Hospital and Medical Center, Burlington, Massachusetts

Lichen sclerosus (LS) is a chronic and progressive inflammatory dermatologic condition that predominantly affects the genital and anal regions of both males and females. In men, genital LS may involve the glans and skin of the prepuce or penile shaft. Men may present with porcelain-like skin changes; presence of plaques, fissures, or erosions of the skin; pruritus; and pain with erections due to stretching and tearing of skin adhesions (Figure 1). This progressive scar-forming process may result in a spectrum of findings, ranging from superficial skin changes to phimosis and adult acquired buried penis (Figure 2). The exact



Figure 1. Lichen sclerosus of the glans and surrounding penile skin.

etiology of LS remains unknown; however, numerous proposed theories exist linking the mechanism of LS to an infectious, autoimmune, traumatic, or genetic etiology. What is clearly understood is that chronic inflammation and irritation play a fundamental role in disease development and propagation.

In males, LS can result in the development of LS-induced ure-



Figure 2. Lichen sclerosus in setting of adult acquired buried penis.

thral stricture disease (LS-USD). LS is believed to be the cause of USD in approximately 14%-29% of cases.¹ In addition to the physical stigmata of LS, patients with LS-USD will present with the characteristic symptoms of USD, including dysuria, obstructive voiding, splitting of the urinary stream, and painful ejaculation. Men with LS-USD range in severity from meatal stenosis to panurethral involvement



Figure 3. Lichen sclerosus of the glans with evidence of meatal stenosis.

(Figures 3 and 4). The classically described course of LS-USD is a distal-to-proximal stricture progression of the urethra up to the bulbomembranous junction. Although this describes the typical presentation of LS, isolated bulbar USD secondary to LS has also been described.² Such findings reinforce the notion that a clear understanding of the

→ Continued on page 36

CONSERVATIVE MANAGEMENT OF LICHEN SCLEROSUS-INDUCED URETHRAL STRICTURE DISEASE

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Figure 4. Panurethral stricture disease of a patient with lichen sclerosus.

pathophysiological mechanisms of LS and LS-USD remains unidentified.

The standard management of LS-USD spans from observation, topical treatments, urethral dilation, intermittent self-catheterization (ISC), and surgical intervention in the form of urethroplasty (single or multi staged with substitution grafting or perineal urethrostomy). Although urethroplasty has demonstrated success in treating non-LS-USD, surgery is fraught with intraoperative complexity, postoperative complications, and high recurrence rates ranging from 9%-71%.^{3,4} Therefore, many patients and providers seek alternative approaches in the management of LS-USD.

Given the inflammatory and scar-forming tendencies of LS, a cornerstone of conservative treatment is ISC with or without topical corticosteroids, most notably clobetasol propionate 0.05%. The ultimate benefit of corticosteroids remains to be determined. Treatment duration recommendations range from 6 weeks to 3 months. Alternatives such as betamethasone 0.05% and hydrocortisone 2.5%-10% have also been employed. Based on the postulated mechanism of a distal-to-proximal disease progression, past investigations have examined whether early and aggressive treatment of LS with topical corticosteroids may hinder disease progression and reduce the need for more invasive future treatments. Tausch et al reviewed male

LS patients over 10 years, reporting that 7/17 men with mild meatal stenosis and distal preputial involvement were treated successfully with topical clobetasol ointment alone, while 6/10 patients experienced recurrence despite topical treatment. All 10 of these patients received circumcision and/or meatotomy and had no recurrence at a mean follow-up of 38.2 months.⁵

Potts et al examined the success of twice-daily ISC with intra urethral clobetasol.⁶ Overall success, which was defined as not requiring an escalation of care, was seen in 25/28 patients (89.3%) with a mean follow-up of 24.8 months. Only 3/28 patients were able to completely discontinue ISC. No patients went on to require urethroplasty. Although these findings demonstrate that continued ISC with corticosteroids is a favorable alternative to upfront urethroplasty, they do reinforce the progressive nature of LS and LS-USD and that ISC with corticosteroids remains only a temporizing measure.

Similarly, Rozanski et al retrospectively reviewed 112 patients with LS-USD who underwent conservative management with a mean follow-up of 30 months and a mean stricture length of 12 cm.⁷ Balloon dilation was performed in 100/112 (89%) patients. Intermittent self-catheterization was performed in 51/112 (46%) patients, of which 31% performed ISC with intraure-

thral steroids. Treatment escalation was avoided in 94/112 (84%) patients. Eighteen patients (16%) failed conservative management, of which, 16/18 underwent urethroplasty. Patients who performed ISC with and without intraurethral corticosteroid were also compared: 5/16 (31%) patients failed ISC with corticosteroids versus 8/35 (23%) patients failed ISC without corticosteroids. The authors also reported a significant improvement in patient-reported outcomes between their first and last clinic appointments while being managed conservatively. Lastly, the authors identified clinical characteristics associated with conservative management failure, such as a history of UTI, urosepsis, or acute urinary retention. Such information may aid providers in stratifying patients who require closer follow-up or escalation of care.

Aside from corticosteroids, topical calcineurin inhibitors, such as tacrolimus 0.1% ointment, have been used to treat genital LS, primarily for cutaneous manifestations of LS. Tacrolimus has been shown to benefit pediatric patients with LS and meatal involvement, improving urinary symptoms and resolving meatal stenosis 3 weeks following circumcision, but has not been well studied in the adult population.⁸

Novel treatments such as high-intensity focused ultrasound therapy, adipose-derived stem cells, and platelet-rich plasma have been utilized in the treatment of vulvar LS but have yet to find clinical application or utility in the treatment of male anogenital LS or LS-USD. Although these treatments may be limited to the external genitalia, they may prevent the propagation and progression of LS and the ultimate development of LS-USD.

Due to the lack of reliable conservative treatments for LS-USD, understanding its pathophysiology is critical to developing better nonsurgical strategies. Recent publications, such as Levy et al, have begun establishing the mo-

lecular pathophysiology of LS.⁹ Their investigations noted higher expression of inflammatory markers CD8, CCL-4, TNF- α , and IgG-4 in men with LS-USD. Furthermore, Cohen et al demonstrated that the urinary microbiomes of patients with LS and non-LS USD are different.¹⁰ The authors identified a trend towards greater microbiome diversity in patients with LS-USD compared to patients with non-LS USD. These investigations may lay the groundwork for future conservative interventions.

The challenges patients and providers face in the treatment of LS and LS-USD are well established. Although conservative and surgical interventions have shown success in the treatment of LS-USD, they are not without the risk of complication and failure. Further investigations are needed to identify more effective conservative interventions in the treatment of LS-USD. ■

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AUA2023: REFLECTIONS

Hood Hydro Concept, Complex Partial Nephrectomy, and Circulating Tumor DNA

Vinayak G. Wagaskar, MBBS,
MCh Urology

Icahn School of Medicine at Mount Sinai Hospital,
New York, New York

Ketan Badani, MD, FACS (Hon)

Icahn School of Medicine at Mount Sinai Hospital,
New York, New York

Peter Wiklund, MD

Icahn School of Medicine at Mount Sinai Hospital,
New York, New York

Ash Tewari, MD, MCh

Icahn School of Medicine at Mount Sinai Hospital,
New York, New York

Robot-assisted radical prostatectomy is unique because it has to accomplish 3 competing goals: cancer control, urinary continence, and recovery of sexual function. While cancer control is the most important goal, patients' quality of life is equally important since patients have to live with the results of the surgery for a long time after beating this cancer. Continence in men is achieved by delicate and well-orchestrated interplay between a group of muscles (both smooth and voluntary), anchored to fixed bony and ligamentous structures, complemented by cushioning effect of mucosa and surrounding soft and fascial tissue. Intact innervation helps in coordinated squeeze of muscles (sphincters) and relaxation of bladder muscles while angulation between bladder and urethra helps in further closure of bladder outlet, especially in times of increased stress such as coughing or sneezing. The concept of a "trizonal neural hammock" revealed that the periprostatic nerves are located in discrete regions around the prostate forming a "hammock-like" architecture. The return to urinary continence and recovery of erectile function are enhanced by the characterization of grades of nerve sparing, in which various levels of periprostatic fascial dissection are employed to optimize nerve preservation on a case-by-case basis. Our "hood technique" is unique in that it uses an anterior approach to preserve

the contents of the space of Retzius during robot-assisted radical prostatectomy (see Figure).¹⁻³ Upon removal of the prostate, the preserved tissue has a "hood-like" appearance, comprised of the detrusor apron, arcus tendineus, puboprostatic ligament, anterior vessels, and some fibers of the detrusor muscle. The hood effectively encloses and protects the membranous urethra, external sphincter, and supportive structures without compromising margin rates or biochemical recurrence rates. Our team has revolutionized technique of hydrodissection that facilitates intraoperative visualization of periprostatic nerves. The injection of saline solution at low pressures promotes an atraumatic dissection of the neural hammock, optimizing erectile function outcomes. Additionally, the use of intraoperative microultrasound enhances oncologic safety when dissecting the fascia layers in individuals who have a higher risk of extracapsular extension. Compared to the standard technique, the saline assisted fascial engorgement does not lengthen the procedure or increase complications. Besides, it is easy to learn and perform, producing superior functional results, similar positive surgical margin rates, shorter operating times, and less blood loss compared to the standard technique.

The Comprehensive Kidney Cancer Center at Mount Sinai Health System is proud to host our annual innovations conference. Led by Ketan Badani, MD, FACS (Hon), the goal of the session is to discuss the tips and tricks for complex robotic partial nephrectomy and retroperitoneal approaches.

We have assembled an expert panel to discuss the nuances and challenges during the video stream. Our aim is to share our knowledge and expertise with other medical professionals to help expand access to partial nephrectomy in challenging clinical scenarios.

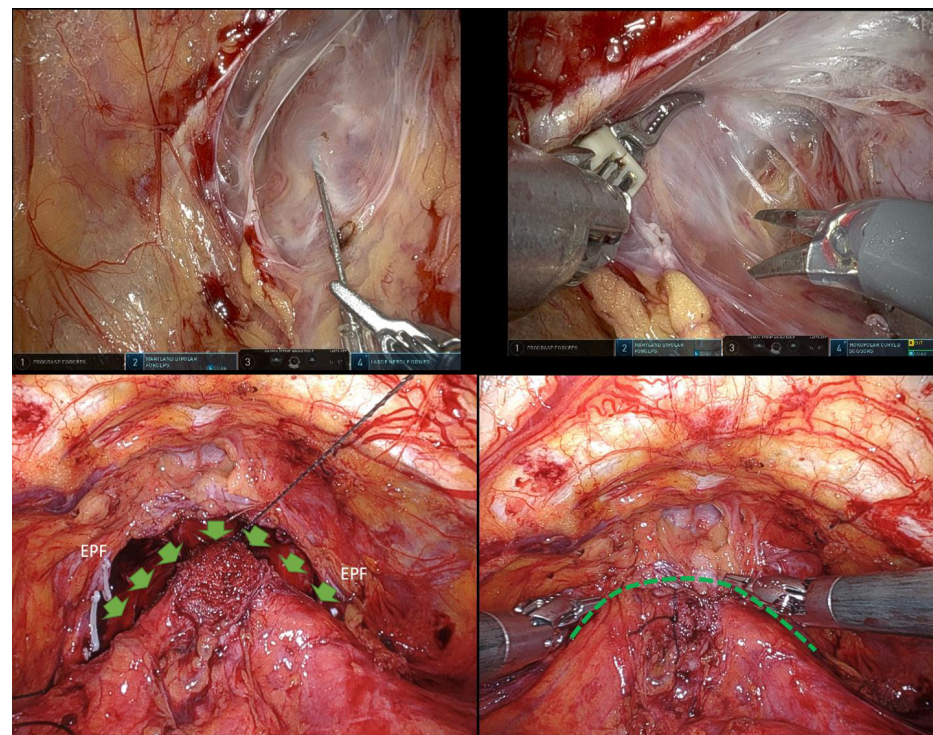


Figure. Hydro hood technique. EPF indicates endopelvic fascia.

Our focus for this edition is to showcase the benefits of standardizing surgical technique, establishing efficient operating room teams, maintaining continuity and precision in surgical steps, and utilizing advanced technology. These practices have proven to yield optimal clinical outcomes, particularly in the management of challenging high-complexity renal tumors

Utilizing cutting-edge technology is a cornerstone of our approach. As a team, we are passionate about pushing the boundaries of kidney cancer diagnosis through the implementation of innovative imaging techniques such as radiomics and microultrasound, as well as exploring the potential of translational medicine and artificial intelligence. Our commitment to this is also exemplified by our standardized use of intraoperative ultrasound, indocyanine green dye, and 3D models. We are proud to share the wealth of knowledge the collective group has accumulated over the years with the urological community.

The Mount Sinai Bladder cancer program, led by Peter Wiklund, MD, along with his colleagues John Sfakianos, MD, and Reza Mehrazin, MD, has explored the role of circulating tumor DNA-based molecular residual disease in a real-world cohort of patients with bladder cancer who underwent curative-intent cystectomy. Our results showed circulating tumor DNA beneficial for decision-making in patients who may benefit from neoadjuvant and adjuvant therapy, assessing molecular residual disease, and monitoring treatment response. ■

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Extended Duration Anticoagulation After Radical Cystectomy: The Case for Incorporating an Oral Option

Eva Mace, BS

Louisiana State University School of Medicine,
New Orleans

Kelly K. Bree, MD

MD Anderson Cancer Center, Houston, Texas

Mary E. Westerman, MD

Louisiana State University Health Science Center,
New Orleans

Postoperative venous thromboembolic events (VTE) are the number 1 cause of death among individuals undergoing oncologic surgery. Cancer and major abdominal surgery are both independent risk factors for the development of VTEs; an individual undergoing surgery for oncologic indications will have a 5-7 times greater risk of VTE than an individual undergoing surgery for nononcologic indications. Numerous randomized control trials, summarized in a 2019 Cochrane review, have shown a significant benefit to utilizing 28 days of low-molecular-weight heparin (LMWH) for extended duration VTE prophylaxis (EP) after major abdominal/pelvic surgery.¹ Multiple organizations, therefore, recommend EP with LMWH for up to 4 weeks postoperatively for patients undergoing open or laparoscopic abdominal or pelvic surgery for cancer.

Between 3% and 11% of patients undergoing radical cystectomy (RC) for bladder cancer develop a VTE, more than 50% of which occur after hospital discharge.² This is not just a product of historical or retrospective data. In the Intracorporeal Robotic vs Open Cystectomy trial, a randomized control trial published in 2022, 5% of patients experienced a VTE despite the use of EP.³ Although there are no randomized trials specifically evaluating the benefits of EP use after RC, previous oncologic surgery trials and retrospective RC series consistently demonstrate lower rates of VTE with no associated increase in bleeding events. For example, 1 month of LMWH after RC has been associated with a 3-fold reduction in the rate of VTE (6% no EP vs 2% EP).^{2,4}

Currently, the AUA strongly recommends perioperative pharmacologic VTE prophylaxis and states

Table. Summary of Recent Literature Reporting on Use of Direct Oral Anticoagulants for Extended Duration Venous Thromboembolic Event Prophylaxis After Radical Cystectomy

Author	Year	Type	No.	Primary outcome	Results
Ortiz et al ⁸	2021	Single center retrospective comparative	DOAC: 29 Enoxaparin: 37	Symptomatic VTE within 90 d	3% vs 8.1% P = .62
Rosen et al ⁹	2022	Multi-institutional retrospective case series	Apixaban: 72	Symptomatic VTE within 30 d	0
Faraj et al ¹⁰	2022	Single center retrospective comparative	DOAC: 46 Enoxaparin: 55 None: 556	Symptomatic VTE within 90 d	0% vs 3.6% vs 7.2% P = .11
Rich et al ¹¹	2023	Single center retrospective comparative	Apixaban: 124 Enoxaparin: 250	Symptomatic VTE within 90 d	1.6% vs 3.2% P = .5

Abbreviations: DOAC, direct oral anticoagulant; RC, radical cystectomy; VTE, venous thromboembolic event. For all studies the primary outcome was symptomatic VTE during a specified time period after RC.

treatment up to 4 weeks may be beneficial.⁵ The European Association of Urology guidelines are more specific and note that the risk of VTE is essentially unchanged during the first 4 weeks after surgery, and therefore 4 weeks is the optimal duration of pharmacologic prophylaxis, thus recommending EP for all patients undergoing RC, regardless of open or robotic surgical approach.⁶

Enoxaparin, an injectable LMWH, is the most common agent used for EP. However, there are numerous

barriers to using LMWH including cost, insurance coverage, need for self-injection, and side effects such as pain, bruising, and nausea. A 2020 survey of urologic oncologists by Dall et al found that nearly 40% reported barriers to LMWH use, typically cost and patient compliance.⁷

Direct oral anticoagulants (DOACs), including direct thrombin inhibitors (dabigatran) and direct factor Xa inhibitors (rivaroxaban, apixaban, edoxaban, and betrixaban), are emerging as a potential

alternative to injectable LMWH. Among cancer patients, DOACs have been associated with lower rates of VTE recurrence and comparable rates of major bleeding relative to LMWH, with apixaban 2.5 mg twice daily commonly being used. Importantly, andexanet alfa (Andexxa) was approved by the Food and Drug Administration in 2018 as the first and only antidote for anticoagulation reversal in patients treated

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Practice change to from injectable to oral anticoagulation for post-operative extended duration VTE prophylaxis

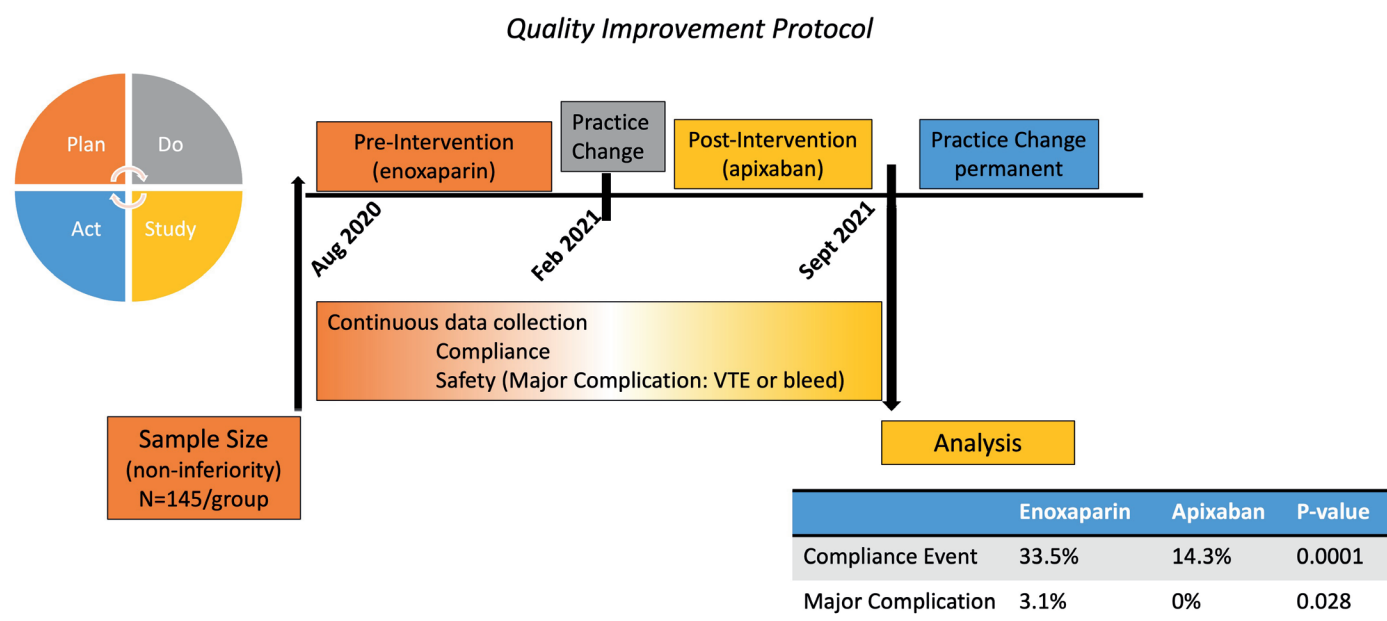


Figure. Quality improvement methodology evaluating a practice change from injectable to oral anticoagulation for extended duration venous thromboembolic event (VTE) prophylaxis conducted at MD Anderson Cancer Center from August 2020 until September 2021. The aim was to improve patient compliance and test noninferiority (safety) of an oral direct oral anticoagulant compared to enoxaparin. The baseline data collection was set at 6 months using a noninferiority sample size estimate of n=290 (145/group) to ensure adequate data to assess safety. The intervention (apixaban) data collection was at least n=145 with an option to stop at 6 months for futility. On final analysis apixaban not only met the prespecified noninferiority threshold, but also demonstrated superiority regarding major complication incidence. In addition, there were significantly fewer compliance-related events in the apixaban group. Based on these findings, the practice change to oral direct oral anticoagulants was made permanent. Reprinted with permission from Westerman ME, *J Urol*. 2022;208(4):886-895.¹³

EXTENDED DURATION ANTICOAGULATION AFTER RADICAL CYSTECTOMY

→ Continued from page 38

with apixaban (and rivaroxaban).

Four recent retrospective studies, summarized in the Table, demonstrated the feasibility of using DOACs for EP after RC with no evidence of increased bleeding.⁸⁻¹¹ A 2020 randomized control trial comparing 28 days of apixaban or enoxaparin for the prevention of VTE following gynecologic oncology procedures also found no difference in bleeding or VTE events between groups.¹² Unsurprisingly, patients in the apixaban group reported significantly higher patient satisfaction with regard to ease of taking the medication (98.6% in the apixaban group vs 58.8% in the enoxaparin group, $P < .001$).¹²

A 2021 prospective quality improvement study at MD Anderson Cancer Center evaluated a uniform practice change from enoxaparin to apixaban (see Figure).¹³ One hundred sixty-one patients in the enoxaparin group were compared to 154 patients in the apixaban group. Overall major complications (major bleed or symptomatic VTE) occurred in

3.1% of the enoxaparin group compared to 0% in the apixaban group ($P = .028$ for superiority). Compliance events (need for medication or pharmacy change due to copays, non-compliance, etc) occurred in 33.5% of patients on enoxaparin compared to 14.3% of patients on apixaban ($P = .0001$). Patients receiving apixaban were more likely to have a zero-dollar copay (40.3% vs 12.4%, $P < .001$), likely due to the availability of manufacturer co-pay coupons, which remain widely available. Based on these results, the department has continued to use apixaban as the standard for EP.

Patients undergoing RC are at high risk for VTE in the postoperative period. Four weeks of thromboprophylaxis should be strongly considered for all patients following RC. While the AUA guidelines are less specific than the European Association of Urology guidelines on recommended duration, the rationale for a minimum of 28 days of EP use is strong: bleeding risk decreases while VTE risk is con-

stant over the first 4 weeks. In addition, apixaban is noninferior to enoxaparin for EP after urologic oncology surgery and in fact may have a more favorable safety profile, although superiority should be tested in a randomized control trial. Oral apixaban is safe, preferred by patients, and should be offered as an option for EP in bladder cancer patients following RC. ■

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AUA2023: REFLECTIONS

Second Opinion Cases: Challenging Scenarios: Irritative Urinary Symptoms in Men

O. Lenaine Westney, MD

MD Anderson Cancer Center, Houston, Texas

Joshua Cohn, MD

Fox Chase Cancer Center, Philadelphia, Pennsylvania

Brian Flynn, MD

University of Colorado, Denver

Melissa Kaufman, MD

Vanderbilt University, Nashville, Tennessee

Jaspreet Sandhu, MD

Memorial Sloan Kettering Cancer Center, New York, New York

Introduction

Dr Westney framed the difficulties of treating the male patient with irritative symptoms due to the diversity of clinical scenarios which may be present and the lack of guiding evidence. Compared to an index

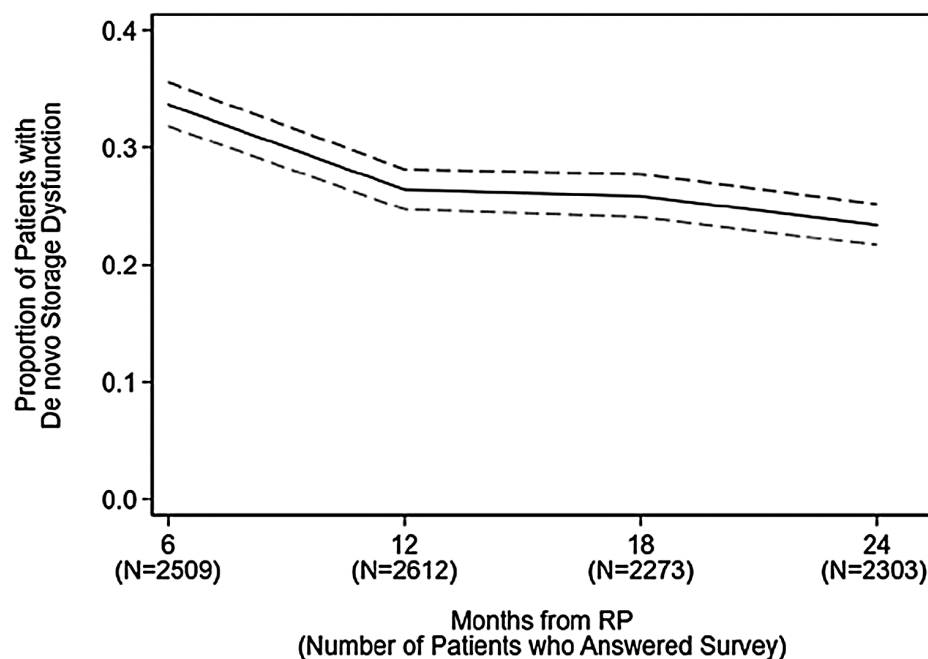


Figure 1. Proportion of patients with de novo storage dysfunction (and 95% confidence interval) based on months after radical prostatectomy (RP).

overactive bladder patient, the male patient presenting with symptoms may be complicated by the presence of the prostate and/or multimodality treatment for pelvic cancer. Males treated for prostate and colorectal cancer constitute the bulk of male cancer survivors.¹ A high percentage of these patients have undergone radiation due to the pivotal role of radiation in the treatment algorithms for these malignancies.

As described by Kan et al, the prostate cancer patient treated with radical retropubic prostatectomy reports a de novo storage dysfunction of over 25% (Figure 1).² The addition of radiation has been demonstrated to intensify overactive bladder and lower urinary

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SECOND OPINION CASES: CHALLENGING SCENARIOS: IRRITATIVE URINARY SYMPTOMS IN MEN

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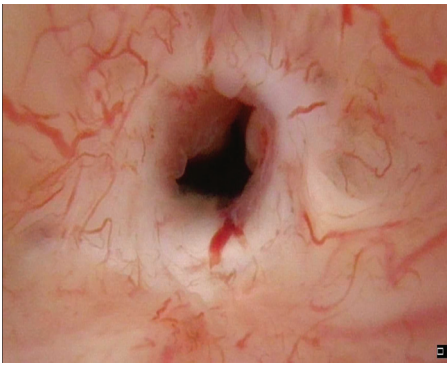


Figure 2. Lower urinary tract symptoms after radiation therapy (prostate in situ).

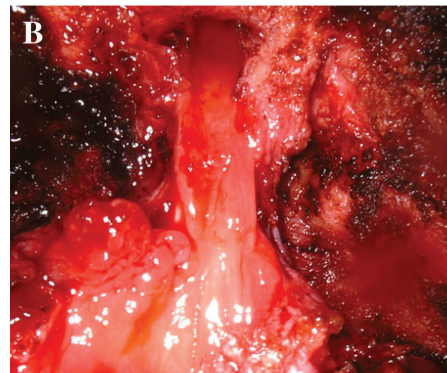
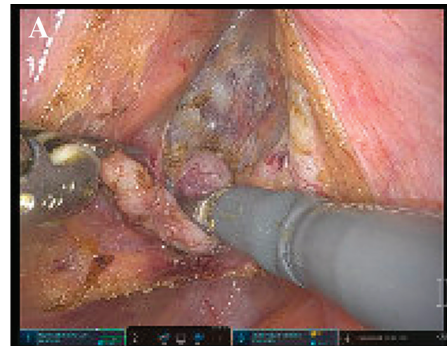


Figure 3. A, Dissection of bladder neck and scar excision. B, Preparation for bladder outlet reconfiguration.

tract symptoms.³ Posttreatment bladder dysfunction may be further complicated by bladder neck contracture (Figure 2). The panel was charged with utilizing the best available evidence and



Figure 4. Postprostatectomy and radiated patient with pad weight reduction of 653 to 157 g with adjustable continence balloons.

expert opinion to manage 4 clinically challenging scenarios.

Lower Urinary Tract Symptoms After Radiation Therapy (Prostate in Situ)

Dr Sandhu presented 2 cases focused on symptomatology in the radiated patient with a prostate in situ. The first highlighted the indications and complications for an outlet-reducing procedure in the setting of radiation. In addition to anatomical evaluation with cystoscopy, Dr Kaufman emphasized the utility of multichannel urodynamics in the high-risk population to yield the information required to counsel and generate a treatment plan. In the management of outlet reduction in this patient, Dr Flynn stated his preference for utilization of a laser procedure, either GreenLight or thulium, rather than loop resection. Dr Cohn mentioned the selective use of prostate enucleation after careful patient evaluation. In counseling this patient population, incontinence, residual symptoms, and future development of fistula must be discussed. Dr Sandhu presented data revealing that age and the presence of preoperative urinary urgency are associated with an elevated risk of posttransurethral prostatectomy incontinence.⁴

The second case focused on the treatment options in the radiated patient with the nonobstructive prostate gland. This underscored the paucity of publications discussing the efficacy of second- and third-line overactive bladder therapies in the male and/or radiated patients.⁵ In selecting a pharma-

cological agent for these patients who are often elderly, Dr Kaufman stated her preference for a hydrophilic agent, such as trospium chloride, or a β -3adrenergic agent (mirabegron or vibegron). In the application of third-line therapies, both Drs Flynn and Cohn had experienced a high success rate with botulinum toxin over neuromodulation in this population.⁶ Drs Kaufman and Westney supported the use of urodynamics in guiding selection between therapies with botulinum toxin as the first choice in those with high amplitude detrusor contractions.

Urinary Incontinence and Incomplete Emptying

Dr Flynn presented 2 cases illustrating the management of vesicourethral anastomotic stricture. During the first, Dr Cohn discussed the caliber of stricture requiring intervention with emphasis on the ability to navigate the outlet with a flexible cystoscope and ability to place a catheter in the event of surgical procedures. Subsequently, Dr Sandhu reviewed a graded approach to addressing bladder neck contractures. In general, patients are likely to have undergone prior dilation, thus, he proceeds with 2-4 incisions with or without fibrinolytic agents. The need for avoiding the anterior and posterior midline was reiterated. The utilization of injectable agents was then discussed by the panel. Drs Kaufman and Westney advised judicious and limited use of steroids and mitomycin in the radiated patient. Dr Cohn advocated for the recently introduced mucosal advancement technique. Dr Westney summarized the standard practice of waiting at least

3 months after treatment of a bladder neck contracture prior to proceeding with an anti-incontinence procedure.

Dr Flynn's second case featured a patient with a bladder neck contracture after salvage prostatectomy. Endoscopic methods for reestablishing lumen failed, thus, the patient progressed to robotic bladder neck reconstruction (Figure 3, A and B). Artificial urinary sphincter (AUS) was discussed as a common treatment modality under these conditions. The patient was, however, successfully treated with adjustable continence balloons (Figure 4).

Radiation Cystitis/Refractory Gross Hematuria

Dr Cohn presented the case of a patient who suffered from severe radiation cystitis with debilitating irritative symptoms complicated by multiple operative interventions for clot irrigation (Figure 5). Dr Sandhu discussed his practice of introducing hyperbaric oxygen as early as possible. In the setting of a patient with irritative symptoms without hematuria, Dr Flynn supported the utilization of hyperbaric oxygen with successful resolution of symptoms.⁷ Dr Kaufman discussed the high likelihood that patients with history will progress to the need for cystectomy and urinary diversion. Dr Westney supplemented the importance of counseling patients regarding the transient stabilization of the urethra and the possibility of major surgery in the future.

As an adjunct to the above scenario, the panel discussed their endoscopic approach to clot evacuation in the patient with a functional AUS in place. The practice of performing a perineal incision and uncoupling the cuff was standard strategy to safely pass a resectoscope for adequate irrigation and fulguration. Alternatively, Dr Cohn suggested an antegrade approach via suprapubic access to bypass the need for device manipulation.⁸



Figure 5. Vascular change typical of radiation cystitis in the trigone and posterior bladder wall.

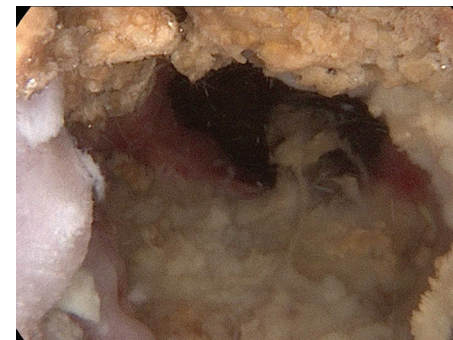


Figure 6. Necrotic bladder neck lined with dystrophic calcification.

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SECOND OPINION CASES: CHALLENGING SCENARIOS: IRRITATIVE URINARY SYMPTOMS IN MEN

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Persistent Dystrophic Calcification

Time did not permit full elaboration on this topic (Figure 6). However, in prior discussions with the panelists, there was agreement on the challenges of managing patients with bladder neck calcifications. There was division regarding whether to monitor these patients serially or wait for development of obstructive symptoms. However, in the patient with an AUS in situ, the panel agreed more aggressive monitoring is indicated. Endoscopic

clearance of obstructive calculi may be accomplished with small-caliber scopes with laser, with more severe cases necessitating techniques similar to those for clot evacuation in the AUS patient, as discussed above. Dr Flynn weighed in on the poor suitability of these patients for bladder neck reconstruction in favor of urinary diversion.

Summary

Management of the male patient with irritative symptoms requires careful evaluation coupled with a

wide range of endoscopic and reconstructive techniques outside the standard management of overactive bladder. ■

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AUA2023: REFLECTIONS

AUA Semi-live Surgery Recap: Endourology

Heiko Yang, MD, PhD

University of California–San Francisco

Thomas Chi, MD, MBA

University of California–San Francisco

Minimally invasive kidney stone surgery continues to push the envelope for surgical innovation in urology. At Chicago's AUA 2023 Annual Meeting on Friday afternoon, April 28, the semi-live surgery plenary session featured new devices and surgical techniques in action.

Ureteroscopy: LithoVue Elite and Ho:YAG Laser With Moses Pulse Modulation

Dr Ben Chew from the University of British Columbia presented a case using the new LithoVue Elite (Boston Scientific, Marlborough, Massachusetts), the second-generation disposable ureteroscope with the highly anticipated feature of live intraoperative pressure monitoring. He also featured different dusting settings on the Moses laser to obtain maximal efficiency. By combining the two technologies, Dr Chew demonstrated how a patient with a large renal stone and a history of sepsis who was not a candidate for percutaneous sur-

gery could be safely treated using ureteroscopy and laser lithotripsy. Key points included keeping intrarenal pressures low and using the distance setting on the Moses laser to avoid burn-back on the laser fiber while dusting. The new pressure-measurement capability of the LithoVue Elite may be an enabling technology that encourages urologists to avoid overpressurizing the collecting system during ureteroscopy, thereby reducing the risk of sepsis. If trial data continue to be supportive, it could be a major clinical advancement for safer surgical stone care in ureteroscopy.

Mini Percutaneous Nephrolithotomy With Thulium Fiber Laser

Dr Thomas Chi from the University of California, San Francisco presented a case using pure ultrasound-guided access for mini-percutaneous nephrolithotomy (PCNL) and lithotripsy using a thulium laser. This case featured the Ultraxx balloon and dilation sheath (Cook Medical, Bloomington, Indiana), a clear mini-PCNL sheath that permits visualization of the dilated tract, facilitating accurate adjust-

ing of the depth of dilation upon insertion of the nephroscope. The fine dusting properties of the Cook Fiber Dust thulium laser demonstrated in this case allowed for precise treatment of an embedded stone at the ureteropelvic junction with minimal unintentional damage to the urothelium. The thulium laser's coagulative properties were also showcased during an infundibulotomy procedure. Key points included (1) encouraging urologists to adopt ultrasound for PCNL given its easier learning curve and decreased radiation exposure compared to fluoroscopy, (2) demonstrating that lithotomy position facilitates combined antegrade and retrograde endoscopy, particularly useful with abnormal anatomy, and (3) that the thulium laser is adept for dusting stones and especially good with infundibulotomy procedures.

LithoVue Elite Clinical Experience

Dr Naeem Bojani from the University of Montreal presented several surgeries showcasing the LithoVue Elite. The first case demonstrated how intrarenal pressure changes during different parts of the case, rising above

“By combining the two technologies, Dr Chew demonstrated how a patient with a large renal stone and a history of sepsis who was not a candidate for percutaneous surgery could be safely treated using ureteroscopy and laser lithotripsy. Key points included keeping intrarenal pressures low and using the distance setting on the Moses laser to avoid burn-back on the laser fiber while dusting.”

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AUA SEMI-LIVE SURGERY RECAP: ENDOUROLOGY

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the threshold of 40 mm Hg when scoping a calyx and with more aggressive irrigation during lithotripsy. The second case provided a great example of how intrarenal pressures can be affected by outflow drainage. In this case, a tight ureter and ureteropelvic junction impaired the outflow even with an 11/13F ureteral access sheath in place, thus leading to much higher intrarenal pressures compared to the first case. The third case demonstrated how keeping intrarenal pressures low with intermittent aspiration can help mitigate infection risk for a patient with a history of sepsis from ureteroscopy. As new data emerges, we anticipate that the importance of understanding intrarenal pressure during stone surgery will become more and more apparent.

Ureteroscopy and Ho:YAG Laser Lithotripsy With Use of CVAC to Aspirate Fragments

Dr Stuart Wolf from the University of Texas-Austin presented the use of the CVAC sheath (Calyxo, Pleasanton, California), a device designed to facilitate active suctioning of stone fragments after lithotripsy. This device, new to the market, is designed to improve stone-free rates after ureteroscopy and laser lithotripsy. Once the ureteroscopy portion of the procedure is completed, CVAC is inserted into the kidney under fluoroscopic guidance and used to suction stone pieces, allowing the surgeon to forego the laborious basketing process. One optimizing strategy high-

lighted with this device involved having the patient in Trendelenburg position to allow fragments to collect in the upper pole, thus facilitating direct access with the CVAC sheath. If stones collect in multiple calyces, the sheath can be directed with the ureteroscope to those calyces for suction. This enabling technology may greatly enhance stone-free rates after ureteroscopy and allow for greater success in treating larger stones in a minimally invasive fashion.

Radiation Reduction: The Life You Save May Be Your Own!

Dr Duane Baldwin from Loma Linda University presented strategies to reduce radiation in stone

surgery. Highlights of his talk included reviewing the “as low as reasonably achievable” principle and how to optimize C-arm settings to reduce radiation when it is used. Using the low dose and pulse settings are easy ways to cut radiation exposure to surgeons, patients, and staff with the push of 2 buttons on any fluoroscopy unit. Also demonstrated was the use of a laser guide to direct needle trajectory during percutaneous renal access to avoid using x-rays and the use of endoscopic combined intrarenal surgery techniques to direct percutaneous access. The key point was to appreciate the cumulative harms of radiation to patients and surgeons. Employing techniques to minimize radiation during these cases can have long-term positive health benefits. ■

AUA2023: REFLECTIONS

Extratunical Grafting for Indentation and Hourglass Deformities With Peyronie’s Disease

Michael Sischka, BS

Mayo Clinic Alix School of Medicine, Rochester, Minnesota

Jayson Kemble, DO

Mayo Clinic, Rochester, Minnesota

Matthew J. Ziegelmann, MD

Mayo Clinic, Rochester, Minnesota
Taxonomy: Operative Treatments, Sexual/Reproductive Medicine, Trauma/Reconstruction

Peyronie’s Disease (PD) results from scar or “plaque” within the penile tunica albuginea. Symptoms include penile pain, shortening, erectile dysfunction, and curvature.¹ Up to 65% of patients may also have focal erectile girth changes such as indentation (unilateral) or hourglass (circumferential) deformity.² In some instances, this may cause buckling during penetrative sexual intercourse, also known as “hinge effect.”

PD treatments include traction therapy, intralesional injections, and surgical straightening.¹ An

increasing number of patients are receiving injections, but there is limited evidence that intralesional therapy improves girth.^{3,4} Surgery is a reliable means to correct deformity and is only recommended in the chronic/stable phase, defined by the 2015 AUA PD guidelines panel as symptom duration ≥ 12 months with stable symptoms for 3-6 months.¹ Several algorithms have been proposed taking underlying erectile dysfunction (ED) into account.⁵ Penile prosthesis with straightening maneuvers is recommended for patients with significant ED. Plication is associated with excellent outcomes for those with maintained erectile function and mild/moderate curvature. With severe curvature and/or severe indentation/hourglass, plaque incision and grafting can correct straightening and improve severe indentation. However, even with careful patient selection and expert

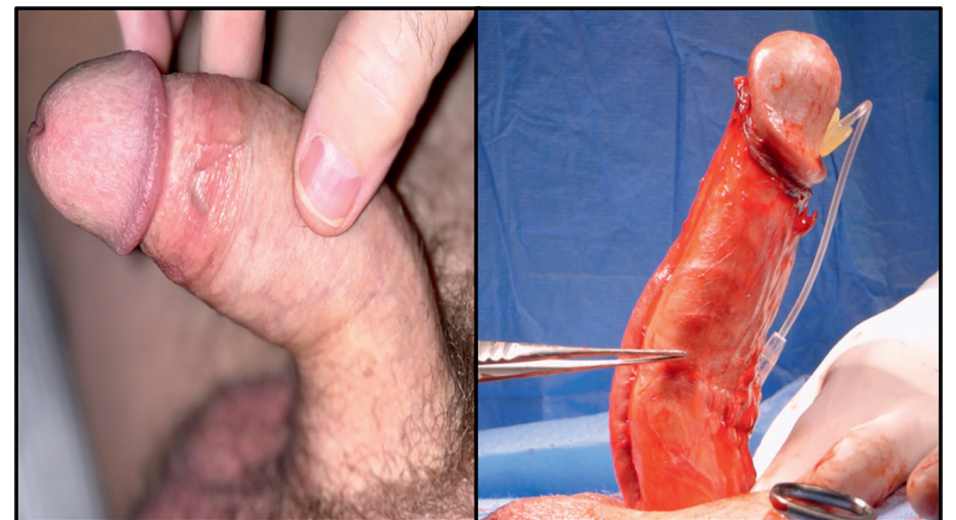


Figure 1. Example of a candidate for extratunical grafting: a 64-year-old male with 45-degree dorsal/lateral curvature and moderate severity indentation.

technique, there is a significant risk for side effects including ED and permanent sensation change.^{1,6} With severe deformity where intercourse is difficult or impossible, some patients will accept this risk

profile after appropriate shared decision-making. In contrast, with less severe curvature deformity, the idea that one could be significantly

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EXTRATUNICAL GRAFTING FOR INDENTATION AND HOURGLASS DEFORMITIES WITH PEYRONIE'S DISEASE

→ Continued from page 42

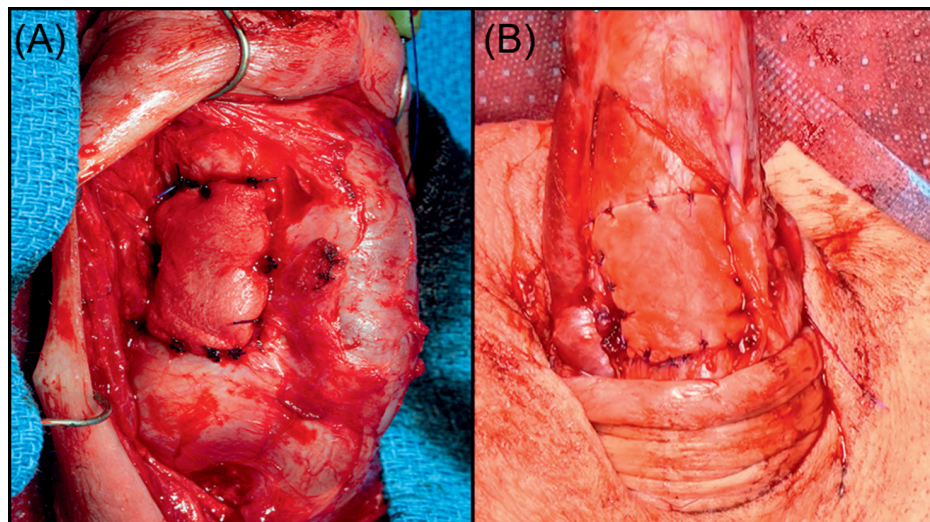


Figure 2. Extratunical grafting with or without penile plication can be performed through a ventral midline penile incision (A) or a subcoronal/degloving approach (B).

worse off from treatment-related side effects is less appealing.

In 2018, Dr Tom Lue and colleagues published the first report of extratunical grafting (ETG) to correct indentation deformity.⁷ With this approach, a biologic grafting material is sutured outside of the tunica albuginea overlying the area of maximum indentation. The technique was developed to minimize postoperative risks for ED and sensory change. Lue and colleagues used a cadaveric fascia lata graft (Suspend) secured with absorbable sutures to “fill in” the indentation. Plication is performed concurrently for patients with curvature. In their series (n=18), 94% of patients reported feeling “satisfied” or “very satisfied” postoperatively.⁷

ETG has gained popularity among urologists who regularly treat PD. The ideal candidate for ETG has bothersome indentation/hourglass with or without associated mild or moderate penile curvature and adequate erectile function (Figure 1). Patients with severe curvature, indentation with associated buckling (hinge effect), and severe penile shortening may be better served with plaque incision and grafting. Those with underlying ED or significant risk factors should strongly consider penile prosthesis placement.

Like most new approaches, ETG is an evolving technique. The original series from Dr Lue's group described using a ventral-longitudinal incision,⁷ which has been suggested for better cosmesis and less sensation change relative to

circumcising incision, albeit with limited exposure for complex deformities. Preference/experience and a willingness to perform both approaches as needed are in the best interest of both patient and surgeon (Figure 2, A and B).

Another consideration is the grafting material. Examples include cadaveric fascia lata, bovine pericardium, porcine dermis, and equine collagen fleece.^{7,9} Our preference is to use cadaveric human pericardium (Tutoplast). It is readily available at our institution and is routinely used for plaque incision and grafting procedures. This material can also be “tailored” to the depth of the indentation deformity by folding it over on itself as needed. The graft edges are secured with interrupted 4-0 polydioxanone, a long-active absorbable monofilament suture (Figure 2, B). To date, there are no definitive data comparing grafting materials (similar to grafting with plaque incision/grafting), so surgeon preference and institutional availability drive graft choice.⁶

A third consideration is whether to place the ETG above or below Buck's fascia. ETG was originally described with the grafting material placed above Buck's, with the proposed benefit of minimizing the risk for sensation change, particularly with circumferential hourglass deformities where dorsal neurovascular bundle mobilization may be required with incision and grafting.⁷ In the original series, slight hypoesthesia was reported by 12% of patients. A subsequent study from Dr Allen Morey and colleagues report-

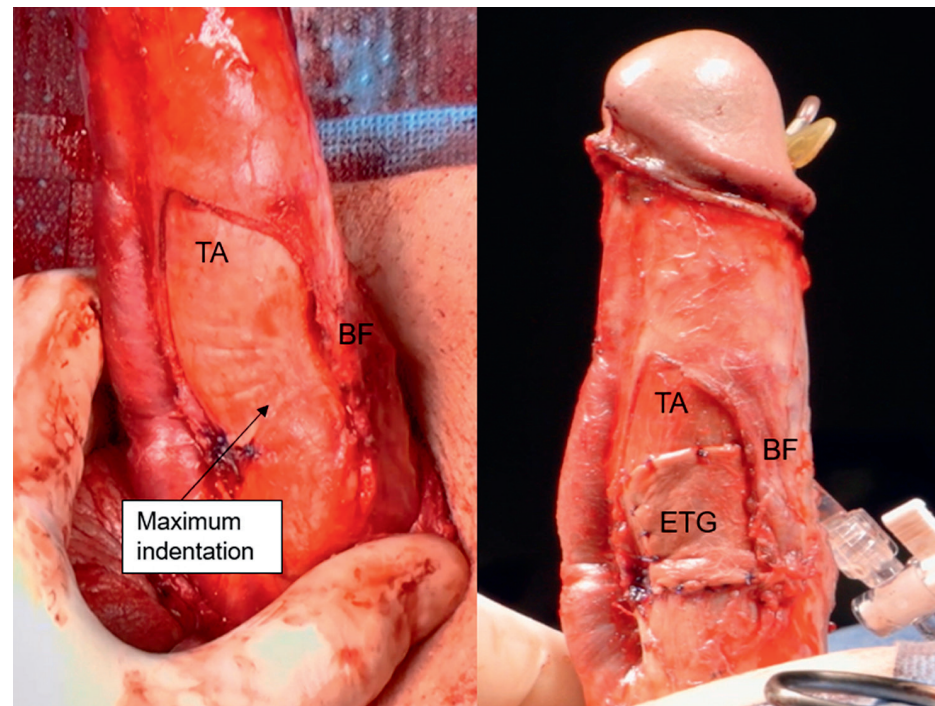


Figure 3. Extratunical graft (ETG) secured underneath Buck's fascia (BF) to the tunica albuginea (TA) overlying the point of maximum indentation.

ed hypoesthesia in only 1/15 ETG patients at follow-up.⁸ A trade-off with this technique appears to be graft palpability. The graft is sewn in place when the penis is erect, so it may bunch up slightly when flaccid. Fifty percent of patients with >6 months follow-up could feel the graft when the penis was flaccid.⁸ In my early experience, several patients were bothered by this palpability, so in some instances I will place the grafting material directly on top of the tunica albuginea after carefully mobilizing Buck's fascia (Figure 3). Anecdotally, I find that the grafting material is less palpable this way, though it is a careful balancing act. Patients need to be counseled about theoretical risks for sensation change. However, in experienced hands, the risk for long-term severe sensory changes even with more extensive neurovascular mobilization for plaque incision/grafting is low.¹⁰

A final consideration is whether ETG provides any structural support to the penis in the setting of penile buckling/hinge effect. There are advocates for and against this hypothesis, but ultimately it is unclear whether added tissue bulk outside of the narrowed tunica provides structural reinforcement beyond penile straightening alone.⁷⁻⁹ Part of the reason for this uncertainty is that we do not know what happens to the grafting material

long term after ETG—resorption with deformity recurrence vs tissue ingrowth vs scarring? Longer-term follow-up will provide more clarity.

In summary, ETG is an important addition to our treatment algorithm for men with PD. Longer-term studies are needed to confirm the early published results and help us to refine the technique. ■

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Have You Read?

Craig Niederberger, MD, FACS
College of Medicine and College of Engineering,
University of Illinois at Chicago

Vince RA Jr, Jiang R, Bank M, et al. Evaluation of social determinants of health and prostate cancer outcomes among Black and White patients: a systematic review and meta-analysis. *JAMA Netw Open*. 2023;6(1):e2250416.

Special thanks to Dr Sophia Ford-Glanton at eviCore Healthcare.

The medical community unfortunately has not always held itself to the highest standards when it came to the care and treatment of ethnic minority patients. Medicine's history with its most vulnerable populations is complicated at best. Recently, there has been much more emphasis and focus on identifying gaps or weaknesses and working to correct and improve. In the oncologic world, prostate cancer outcomes are still disproportionately

“As physicians we must acknowledge how social determinants of health can impact our patient populations and be prepared to account for them so we can ensure that all of our patients achieve the best outcomes possible.”

worse for Black compared to White patients. In this article the authors evaluated if social determinants of health play a role in this disparity.

The authors identified 47 studies for their analysis. Interestingly, they observed that the number of studies published with comparative

analysis of prostate cancer outcomes between races has increased in recent history, with over half of the studies being reported since 2011. They concluded that with all things being equal and with standardized treatment for all patients, Black men with prostate cancer have similar outcomes to their White counterparts. However, when social determinants of health were accounted for, Black patients fared worse. As physicians we must acknowledge how social determinants of health can impact our patient populations and be prepared to account for them so we can ensure that all of our patients achieve the best outcomes possible. Ideally, we will work to ameliorate the barriers that these social determinants erect, providing equitable care for all.

McElree IM, Steinberg RL, Mott SL, O'Donnell MA, Packiam VT. Comparison of sequential intravesical gemcitabine and docetaxel vs bacillus Calmette-Guérin for the treatment of patients with high-risk non-muscle-invasive bladder cancer. *JAMA Netw Open*. 2023;6(2):e230849.

Special thanks to Drs Marcin Zuberek and Simone Crivellaro at the University of Illinois at Chicago.

The COVID-19 pandemic introduced significant challenges including supply chain and production for bacillus Calmette-Guérin (BCG) for immunotherapy for nonmuscle-invasive bladder cancer, under strain even before the coronavirus pandemic. What other alternatives could be clinically effective, safe, and readily available?

These authors studied about 300 patients who were randomly assigned to receive one of 2 treatments, either BCG or docetaxel and gemcitabine intravesical therapy. They observed that sequential intravesical gemcitabine and docetaxel treatment was associated with a longer time to recurrence

compared to BCG, with a median time to recurrence of about 25 months for the gemcitabine and docetaxel group vs about 17 months for the BCG group. The gemcitabine and docetaxel treatment was associated with a similar rate of treatment-related adverse events and having more patients finish the induction course compared to BCG.

BCG is currently the standard treatment for high-risk nonmuscle-invasive bladder cancer, but it is associated with a number of side effects and is often in short supply. The gemcitabine and docetaxel treatment could provide a viable alternative with potentially longer disease-free intervals for patients. This study also demonstrated better adherence to this alternative treatment. From chaos often comes innovation, and COVID-19 may have shown us a better treatment for high-risk nonmuscle-invasive bladder cancer than BCG.

Narang G, Moore J, Wymer K, et al. Effect of cannabidiol oil on post-ureteroscopy pain for urinary calculi: a randomized, double-blind, placebo-controlled trial. *J Urol*. 2023;209(4):726-733.

Special thanks to Drs Rabun Jones and Mahmoud Mima at the University of Illinois at Chicago.

Cannabinoid (CBD) products have demonstrated efficacy for treatment of chronic pain and for cancer patients with pain, but generally quality evidence about urological applications of CBD is limited. These investigators performed a prospective, double-blinded, randomized, placebo-controlled trial examining the effect of CBD on pain after ureteroscopy and ureteral stent insertion. CBD receptors are found throughout the urinary system and are thought to modulate smooth muscle contractility, so the idea was that CBD might be useful after ureteroscopy.

The authors randomized 90 patients to receive the Food and Drug

“From chaos often comes innovation, and COVID-19 may have shown us a better treatment for high-risk nonmuscle-invasive bladder cancer than BCG.”

Administration-approved CBD oral solution Epidiolex or placebo for 3 days after ureteroscopy and stent insertion. In addition to the oral solution, both groups received a standard post-ureteroscopy regimen including oxybutynin, tamsulosin, and phenazopyridine. The primary outcome was the maximum pain score on the visual analog scale on postoperative day 3, with secondary outcomes including the Ureteral Stent Symptom Questionnaire score, pain scores throughout the study, compliance with study drug, rescue narcotic usage, and postoperative complications. Ultimately, there was no significant difference between the primary outcome, nor were there significant differences between any of the secondary outcomes. In fact, the only significant difference was the incidence of dizziness on postoperative day 1, which was higher in the CBD group. Notably, the lowest available dose of the CBD solution was used in the study in order to minimize side effects, so perhaps an increased effect could be achieved with different dosing levels and regimens. As all urologists know, stent discomfort can be challenging, and controlling stent discomfort is advantageous for patients, their surgeons, and the health care system at large. While this well designed and executed study did not reveal a role for CBD after ureteroscopy for pain control, it's a starting point. ■

FROM THE CHIEF EXECUTIVE OFFICER

Focus on Mentorship

Michael T. Sheppard, CPA, CAE
CEO, AUA

Mentorship is generally recognized as an integral component of personal and professional development within medicine, and urology in particular. Because of this, the AUA is committed to including mentorship within our educational and practice resource offerings. We have several programs, some solely focused on fostering mentor-mentee relationships and some larger initiatives with a mentorship component.

I'd like to highlight 3 mentorship programs, all for mentees at different places in their career journeys, as just a small example of the AUA's emphasis on mentorship.

AUA Leadership Program

The AUA Leadership Program is the most venerated and long-standing of the AUA's leadership initiatives. It is designed for urologists who have demonstrated leadership skills within organized medicine and who wish to further develop these skills to become the AUA leaders of tomorrow. Every year, applicants are selected from each AUA Section to participate in a leadership training weekend, group projects with mentors, the Annual Urology Advocacy Sum-

mit, networking events at the AUA Annual Meeting, and more.

Of course initiatives like the Leadership Program would not be possible without the dedicated volunteer mentors who guide our participants through their leadership development. Thank you to the 2023-2024 mentors:

- Arthur L. Burnett, MD, MBA, FACS
- S. Larry Goldenberg, CM, OBC, MD, FRCSC, FACS, FCAHS
- Chris M. Gonzalez, MD, MBA, FACS
- Kathleen Kobashi, MD, FACS
- Jennifer Miles-Thomas, MD, FPMRS
- Craig A. Peters, MD, FAAP, FACS
- Linda Dairiki Shortliffe, MD

Urology Scientific Mentoring and Research Training (USMART) Academy

First conceptualized in 2016 as an answer to the need for mentorship for young urology physician-scientists, specifically as they transition to research independence, the USMART Academy has supported more than 30 mentees representing a range of research areas.

Overall, the USMART Academy envisions a mentoring program

in which every mentee experiences nurturing one-to-one relationships and community support, which in turn allows each of them to develop to their full potential as scientists capable of independent, impactful research and giving back as involved members of the urological research community. The USMART Academy provides an additional mechanism for creative interactions across the AUA between the mentor and the mentee, thereby accelerating the mentee's professional growth, research collaborations, and career building beyond their local environment. The objective is to generate not mentoring overlap, but complementary and independent training support for the mentees to reach their full potential.

Due to its success, the USMART Academy doubled the available mentee positions for the 2022 cohort and committed to increasing the diversity of its participants moving forward.

Future Urology Talent From Underrepresented Entities (FUTURE) in Urology Program

A new initiative from the Diversity, Equity, and Inclusion Committee, the FUTURE in Urology

Program matches URiM (underrepresented in medicine) medical students with mentors who are established in the urology community to foster interest in the specialty of urology.

The inaugural event was held at the Annual Meeting in April (see Figure). URiM students in their first or second year of medical (or DO) school from around the country were invited to attend. Mentors exhibited a diverse background of race, age, geographic location, practice specialty, and LGBTQIA+ affiliation. Over 50 students participated and attended AUA2023 events such as abstract sessions, editorial board meetings, the Residents Bowl, and more with their mentors. The goal is to continue to grow this initiative and host similar events each year—stay tuned!

This is only a fraction of the opportunities the AUA offers to support our next generation of urologists, physician-scientists, and leaders in the urology community. I hope you take time to explore the programs listed above, as well as our many other mentorship offerings, and please consider getting involved—as either a mentor or a mentee—the benefits are abundant! ■



Figure. Inaugural FUTURE in Urology Program at AUA2023.

FROM THE UROLOGY CARE FOUNDATION

Heightened Focus on Humanitarianism

Harris M. Nagler, MD, FACS
President, Urology Care Foundation

The Urology Care Foundation has expanded its vision and mission to better serve the global urology community. We are proud to have created a multifaceted Humanitarian Program which:

1. recognizes humanitarians within urology,
2. supports individuals and projects that provide direct urological patient care for impoverished individuals and communities in underserved areas, either within or outside the United States, and
3. trains individuals who want to become our future leaders.

Humanitarian Recognition Award

The Urology Care Foundation Humanitarian Recognition Award acknowledges an individual for demonstrated commitment to improving access to quality urological health care in underserved populations. The awardee is someone who exemplifies the spirit of philanthropy as evidenced by prior humanitarian work.

In 2021 we awarded Dr Catherine Rhu deVries, who is a leader and visionary in providing urological care, education, and training in low resource areas around the world. In 1995 she created International Volunteers in Urology (IVU),

which organizes 20-25 short-term educational and surgical training trips each year to address congenital urological abnormalities.

In 2022 we recognized Dr Sakti Das, who has served in medical mission work for nearly 40 years, volunteering in 12 countries and on 3 continents, providing direct surgical care, training numerous teams of physicians, and developing infrastructure to sustain treatment for thousands of underserved patients, including a Syrian refugee camp in Jordan. Additionally, he started the Foundation for Freedom, an organization focused on increasing literacy levels in impoverished communities around the world, and is a founding member of IVU, created by Dr deVries.

This year we awarded Dr Serigne Magueye Gueye, who is director of Institut pour la Formation et la Recherche en Urologie et en Santé de la Famille, a nonprofit organization dedicated to building capacity and developing research in urology and reproductive health throughout Africa. Dr Gueye contributes to the development and training of medical doctors, surgical nurses, and other health care professionals through his work with many international programs, including the United Nations Population Fund, Engender Health, and the Women and Health Alliance International, where he runs training workshops in many sub-Saharan African

countries. As our first international recipient, he represents our commitment to having a global impact on urology care.

Humanitarian Grant Program

AUA members who are affiliated with existing humanitarian organizations or have developed projects may apply for grants that support providing direct care, enhancing access to care or through educational efforts. In 2022 we were able to support 7 recipients:

- Victoria Y. Bird, MD—University of Florida's Equal Access Clinic Network (EACN) in Gainesville
- Stephanie J. Kielb, MD—International Organization for Women & Development (IOWD)
- Ian S. Metzler, MD—IVUmed
- Timothy Schuster, MD, FACS—Global Surgical Expedition
- Amar Singh, MD, FACS—IVUmed
- Alan J. Yaghoubian, MD—Jeev Sewa Santhan Organization
- Kit Yuen, MD—University of Rochester and the St Joseph's Neighborhood Center

International Student Humanitarian Research Grant Program

New in 2023, this program supports a medical student who will

travel to, and complete humanitarian work specifically in, the country of Trinidad and Tobago. The grant is awarded to an AUA medical student member who will pursue humanitarian efforts to advance public health and/or quality improvement initiatives in the provision of urological care for this underserved population.

Health Equity Fellowship

An exciting new initiative in 2023 is the Health Equity Fellowship Program, which is designed to train early-career urologists who are passionate about humanitarian work and are committed to becoming future leaders in such endeavors. The 2-year fellowship consists of 1 year of didactic education in partnership with the Center for Urban Bioethics at the Lewis Katz School of Medicine at Temple University. At the end of year 1, the fellow will submit a capstone project which will be supported in year 2 by a grant and ongoing mentoring.

I am proud of the work we have already accomplished in this space and look forward to many more projects and initiatives to better serve the global urological community.

Check out urologyhealth.org/humanitarianism to learn more about the Urology Care Foundation's humanitarian efforts and to apply for funding. ■

FROM THE AUA PUBLIC POLICY COUNCIL

Pools, Popsicles, and Payment Cuts

Eugene Rhee, MD, MBA
Chair, AUA Public Policy Council

In the summertime, everything appears to slow down, and there is a sense of bittersweetness in the air. The days are longer and hotter, and perhaps you've set aside some time for a much-needed vacation. At the same time, you may be say-

ing goodbye to residents and fellows who are embarking on their careers while also eagerly welcoming new faces into your programs. Each year, we find ourselves trying to strike a balance between our personal and professional lives while also enjoying the summer season.

However, things are also heating up on Capitol Hill. It is typically a

busy and lively time, with numerous events that demand our attention. One such event is the release of the MPFS (Medicare Physician Fee Schedule) proposed rule in mid-to-late summer. This proposal carries the threat of physician reimbursement cuts and is consistently reported as the top advocacy concern of AUA members.

Last year, CMS (the Centers for Medicare and Medicaid Services) proposed a staggering 4.5% cut to the conversion factor, which would further reduce physician reimbursement. We are all aware of the negative impact such cuts would have on our practices and, ultimately,

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POOLS, POPSICLES, AND PAYMENT CUTS

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our patients. The AUA collaborated with other urological stakeholders and the wider specialty medicine community to oppose the proposed payment cuts. We spent several months drafting comments to CMS, urging change and highlighting the dire consequences of such cuts. Thanks to our relentless efforts, the proposed cut was reduced to 2% after months of persistent advocacy.

Although this outcome is better than what was initially proposed, it is still an unacceptable conclusion. We have continued to use our voice and influence to fight for appropriate physician reimbursement this year. At the 2023 AUA Summit, advocates urged legislators to hold hearings on physician payment reform to address the ongoing concerns of the physician community.

Additionally, a bipartisan team of physicians in Congress introduced legislation earlier this year to link reimbursement to the Medicare Economic Index to keep up with inflation. The AUA Advocacy team is ready to tackle the Calendar Year 2024 MPFS proposed rule this summer and AUAPAC (AUA Political Action Committee) continues to prioritize physician payment as a top advocacy concern.

You may be wondering how you can help advocate for this important issue. Your support and engagement can make a significant difference. Here are a few ways you can contribute:

1. Stay informed: Keep yourself updated on the latest developments regarding physician reimbursement and related policies.

Read the AUA's Policy & Advocacy Brief for timely updates.

2. Educate others: Spread awareness among your colleagues, patients, and community about the potential impact of physician reimbursement cuts. Share information, resources, and personal stories to help others understand the importance of fair reimbursement for sustaining quality health care.
3. Engage with lawmakers: Contact your local representatives and senators to express your concerns and advocate for appropriate physician reimbursement. Write letters, make phone calls, and participate in town hall meetings or other events where you can share your perspective.
4. Join advocacy efforts: Learn more about organizations like

AUAPAC that actively advocate for physician reimbursement reform. Participate in their initiatives and consider becoming a member to amplify your voice and strengthen collective efforts.

5. Share your experiences: If you have firsthand experiences or insights related to the impact of reimbursement cuts, consider sharing them with relevant stakeholders. Personal stories can be powerful tools for illustrating the real-world consequences of policy decisions.

Remember, advocating for change is an ongoing process, and your involvement can have a meaningful impact. By working together, we can strive for fair reimbursement policies that support health care providers and ensure high-quality care for patients. ■

FROM THE RESIDENTS & FELLOWS COMMITTEE

Highlights From AUA2023

Brett Teplitz, MD

University of Pittsburgh Medical Center, Pennsylvania

AUA2023 has come and gone, returning to the Windy City for the first time since 2019. Once again, urologists from all over the nation and the world came to teach and share their latest innovations, discoveries, and evidence-based insights at the largest annual meeting of urologists and urological professionals. Whether you came away from the events with a fresh perspective on single-port robotic-assisted procedures or a fresh pair of sperm-emblazoned socks, new techniques and vendors were everywhere you looked.

In case you missed the latest conference, or just couldn't be everywhere you wanted to be at once, there's still time to watch most of the weekend's big events, with AUA2023 On Demand. Plenary sessions, forums, specialty societies, abstract sessions, satellite symposia, and more are available online through August 31 (<https://www.auadailynews.org/meeting-coverage/article/22861070/aua2023-on-demand>).

But if you're too busy placing difficult Foleys, or only have 5 min-

utes between cases today, here's a recap of some of the biggest highlights from the weekend.

There's a Flurry of New Guidelines

Prostate cancer screening guidelines have been updated to include a baseline PSA test for men ages 45 to 49, or age 40 to 45 for those at increased risk. The evidence supporting the safety of transperineal biopsy has strengthened, and there was even a lively discussion over renaming grade group 1 disease to drop the term "carcinoma" to minimize overtreatment. Dedicated and updated upper tract urothelial carcinoma guidelines have arrived, including recommendations for intravesical chemotherapy after ureteroscopic biopsy and screening for Lynch syndrome in upper tract urothelial carcinoma patients, which affects ~10% of this patient population.

Is Percutaneous Nephrolithotomy Dead?

Depends on who you ask. Advancements in mini and ultra-mini

percutaneous nephrolithotomy have made careful patient selection and surgeon experience critical factors in deciding who would benefit from the latest advancements in making the treatment of large stones even more minimally invasive.

New Evidence May Change How You Practice

If you listened to Dr Shore, you might be convinced that enzalutamide in combination with leuprolide may become the new standard of care for patients with high-risk biochemical recurrence, based on the EMBARK trial.

Front and Center in Pediatrics: Ethics, Diversity, and Inclusion

The shock waves from the Dobbs decision are still being felt, raising questions about the future of fetal intervention, and the evolving discussions surrounding gender-affirming care have extended to and impacted the work of pediatric urologists across the country. Caring for patients

across state lines is a particularly vexing challenge in the current climate.

Lastly, there was a renewed focus on the health of... urologists. Presentations on ergonomics to reduce injuries, studies on the value of microbreaks and stretching in the operating room for reduction of pain, and sessions on combating burnout to maximize well-being and career longevity were among the most popular on the #AUA2023 Twitterverse.

A huge thank you is owed to the thousands of staff, speakers, vendors, participants, presenters, and volunteers who helped make AUA2023 a tremendous success.

See you next year in San Antonio!

Since its inception in 2002, the Residents and Fellows Committee has represented the voice of trainee members of the AUA. The Committee's mission is to address the educational and professional needs of urology residents and fellows, and promote engagement between residents and fellows and the AUA. The Committee welcomes your input and feedback! To contact the Committee, or to inquire about ways to get more involved, please email rescommittee@AUAnet.org. ■

SPECIALTY SOCIETIES

Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction 2023 Annual Meeting Recap

David Ginsberg, MD

USC Keck School of Medicine, Los Angeles, California

The Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU) hosted a great afternoon of content on the Friday afternoon of the AUA Annual Meeting in Chicago. The program, which was planned by Dr Karyn Eilber, very nicely highlighted many topics and challenging issues that our members commonly see in their practices. The first panel, moderated by Dr David Sussman, focused on office-based therapies. Some of the highlights from that session included Dr Nirit Rosenblum discussing the use of vaginal laser therapies for vaginal rejuvenation and sexual function, Dr Dean Elterman describing the indications and outcomes of office-based therapies available for benign prostatic hyperplasia, and Dr Priyanka Gupta discussing how she performs injection of bulking agents in the office, which included a great video demonstrating how local anesthetic is delivered prior to the injection.

Another outstanding panel, New Developments in IC [Interstitial Cystitis], was moderated by Dr Larissa Rodriguez and included Drs Lysanne Campeau, Robert Moldwin, and Karl Kreder. The indications and use of over-the-counter supplements was discussed as was the recent update of the IC Guidelines (and the removal of tiered recommendations) and a summary of recent finding from the MAPP (Multidisciplinary Approach to The Study of Chronic Pelvic Pain) with some of the take-homes including the importance of widespread pain vs localized pain as unique phenotypes, utilizing a standard physical examination template to assess for pelvic muscle tenderness. A panel on neurogenic lower urinary tract dysfunction (NLUTD) included Dr Anne Cameron reviewing the risk stratification system from the AUA/SUFU NLUTD guidelines, which helps providers understand how these patients should under-



Figure 1. Panel on office-based therapies including Drs Nirit Rosenblum, Siobhan Hartigan, Priyanka Gupta, Michael Ehlert, and David Sussman.

go routine surveillance, Dr Angelo Gousse discussing the optimal use of botulinum toxin, and Dr Stephanie Kielb describing the potential increasing use of neuromodulation in the NLUTD population, especially now that we have devices that are MRI-compatible (Figure 1). Dr Gary Lemack was the moderator for a panel that discussed the care for a 70-year-old man with urinary retention, an enlarged prostate, and history of a cerebrovascular accident. Dr Doreen Chung discussed the pros and cons of including cystoscopy and urodynamics in the evaluation of this patient, Dr Bilal Chughtai discussed minimally invasive options for this patient with a prior cerebrovascular accident, and Dr Ricardo Gonzalez advocated for holmium laser enucleation of the prostate, which would benefit this patient independent of this prostate size. The final panel of the afternoon, moderated by Dr Una Lee, focused on recurrent urinary tract infection (UTI). Dr Quentin Clemens discussed nonantibiotic strategies such as the benefits of increased water intake, methenamine, and cranberry, Dr Curtis Nickel introduced the very exciting concept of a vaccine for UTI (that we are all waiting to be available to use clinically!), Dr Lenny Ackerman discussed the microbiome (lots of interesting data in this space, but it is still not clear how we are to use these when evaluating and treating patients with recurrent UTI), and Dr Blayne Welk's strategies to deal

with catheter-related UTIs included judicious testing of the urine for infection (including changing to a new catheter before obtaining the urine specimen) and various bladder irrigation strategies.

The afternoon also included 3 entertaining debates. With Dr Polina Reyblat moderating, Drs Jennifer Anger and Christi Butler debated the need to have had fellowship training to participate in transgender surgery. The consensus was that the critical aspects of training to gain proficiency in gender affirming surgery, whether in an FPRMS or a gender affirming-focused fellowship, include surgical expertise, patient access, earning community trust, understanding the importance



Figure 2. Drs CR Powel and Aqsa Khan ready to debate.

of interdisciplinary care teams, and building life-long relationships with colleagues within the field. The subject of the debate between Drs Seth Cohen and Anne Suskind was “Anticholinergics: Do they Really Cause Dementia?” This question, and the potential concern that medications we are prescribing for our overactive bladder patients may result in worsening cognition, continues to be a significant issue for many AUA members. The consensus from this debate, which was moderated by Dr Howard Goldman, was that while there are clearly data demonstrating an association with some of the anticholinergics to dementia, one must balance the small risks with the improved quality of life many patients experience when treated. All things being equal, most would preferentially utilize β -3 agonists, but cost is an important factor that limits adopting that approach. One of the highlights of the afternoon was the debate between Drs CR Powel and Aqsa Kahn, and included t-shirts that Dr Powell made just for the debate (Figure 2). Moderated by Dr Ariana Smith, the debate was “Bothersome Prolapse and Incontinence in Women of Childbearing Age.” Dr Powel had the side of “Help a Girl Out” and Dr Khan advocated for “Deal With it Until After Childbearing.” Both sides made great arguments in favor of their position, and it was clear that this is a challenging situation that could be handled with either strategy and clearly requires conversations between the provider and the patients so decisions can be made in a shared decision-making manner.

We were happy to highlight such a wonderful variety of topics and young speakers. The afternoon provided a great array of educational content within the many disorders that are seen by SUFU members, and for those who want to continue to learn in this space we look forward to seeing you at our winter meeting, February 20-24, 2024, in Fort Lauderdale, Florida. ■

AUA SECTION MEETINGS

New York Section Annual Meeting, San Sebastian, Spain

James A. Eastham, MD, FACS
President, New York Section, AUA

A warm invitation to you all to join us in San Sebastian for the 119th Annual Meeting of the New York Section of the AUA from August 27-September 2, 2023. Located in northern Spain on its border with France, San Sebastian, or Donostia, is at the foot of the Pyrenees and the shores of the Bay of Biscay. This idyllic location, plus more Michelin star restaurants per capita than any other city, will host our wonderful scientific meetings and social program which have come to define the New York Section Annual Meetings. We arrive in San Sebastian on Sunday, August 27. An afternoon walking tour is followed by an evening welcome reception. Scientific meetings commence on Monday morning. Following a week of education and activities, the meeting ends on Friday evening with our gala dinner. Departures are on Saturday, September 2.

Home for the week will be the Hotel Maria Christina. Named in honor of a Spanish Queen, the hotel is luxurious, well suited for royalty and urologists alike. The



venue is located centrally, a short walk from the Concha Beach, Old Town, and numerous culinary options. Experience Basque traditions including Pintxos (delicious snacks available in most bars like tapas), Txakoli wine (delightful, young, and fruity), Basque cheesecake, and the celebration of August 31 commemorating a battle in 1813 when the city was destroyed with only a single street from “old Donostia” surviving.

Our Senior Program Chair, Jaspreet Sandhu, along with Scientific Program Chairs, Amanda North, Michael Palese, and Andrew Winter, have assembled an outstanding educational program. All areas of urology will be covered as well as diversity, health equity, and health policy. Panel discussions with audience participation and debate are

expected as we address many current controversies in urology.

We have organized several group excursions and tours. On Monday afternoon we explore the highlights of San Sebastian with an evening sampling Pintxos and a cold beverage or 2. Tuesday, we lunch in Getaria, a quaint fishing village, with a stop at a cider producer on the return trip. Wednesday we're off to Bilbao, with walking tours of the old city and a visit to the Guggenheim Museum, where the structure, designed by architect Frank Gehry, is as much art as it is a building. Thursday the President's Cocktail Reception will be held at the Tabakalera, a former cigarette factory which is now a cultural center. Finally, our Gala Dinner will be held at the Telmo Art Museum, a former Dominican monastery now

devoted to old and contemporary Basque culture. In addition to organized activities, the schedule provides plenty of opportunity for exploring, learning, and relaxing.

The spouse and guest activities provide an opportunity to meet new people and experience a new culture. Options include the Mimo Cooking School, a biking or hiking tour, a visit to the Balenciaga Fashion Museum, a trip to the Chillida-Leku Museum featuring the works of sculptor Eduardo Chillida, and sea kayaking on the tranquil Concha Bay.

We invite you to join us in what promises to be a truly memorable experience. For further information, please visit our website at: <https://nyaua.com/conference/conf-welcome/>. ■

AUA2023: REFLECTIONS

BPH Hands-on Course Recap: Innovative Models, Surgical Technologies, and Experienced Faculty

Mark A. Assmus, MD
University of Calgary, Alberta, Canada

Amy E. Krambeck, MD
Northwestern University, Chicago, Illinois

This year's AUA Annual Meeting in Chicago featured 7 diverse hands-on skills training courses, including “Surgical Management of Benign Prostatic Hyperplasia (BPH),” directed by Drs Amy Krambeck and Mark Assmus. In an effort to fill an AUA-identified

gap in ablative and minimally invasive surgical training for BPH, this course combined novel integration of 3D-printed prostate models with endourological technologies and knowledgeable faculty. This 3-hour course provided over 50 participants with valuable didactic lectures and exposure to 4 categories of small-group hands-on stations led by 14 urologists from across North America.

The didactic program measured objective pre- and posttest evaluation of the participants with respect to indications, equipment, surgical steps, and complications associated with AUA guideline-recommended BPH treatments.¹ Lectures from Amy Krambeck, MD, Naeem Bhojani, MD, Joel Funk, MD, and Deepak Agarwal, MD, focused on large-gland evaluation, robotic water-jet treatment (RWT), holmi-

um laser enucleation of the prostate, thulium laser enucleation of the prostate, and prostate morcellation.

To reinforce the didactic program, the hands-on component of the course successfully led participants through four 30-minute stations including RWT (Aquablation), holmium laser enucleation of the prostate, thulium laser

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BPH HANDS-ON COURSE RECAP: INNOVATIVE MODELS, SURGICAL TECHNOLOGIES, AND EXPERIENCED FACULTY

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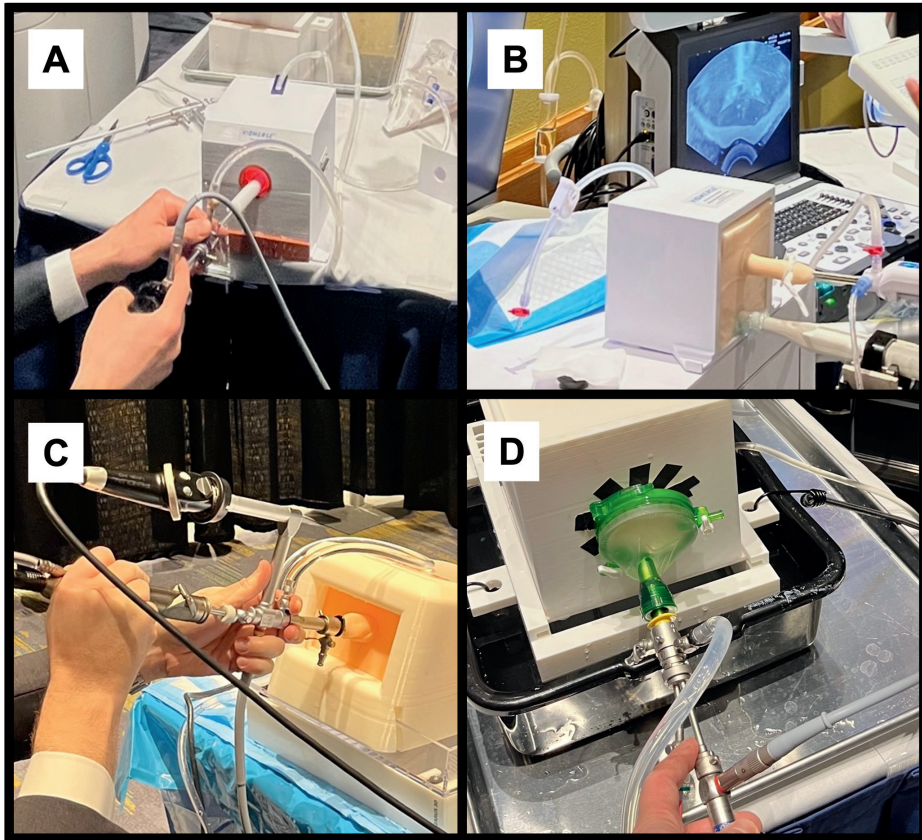


Figure 1. Four prostate models utilized during benign prostatic hyperplasia hands-on course at the 2023 AUA Annual Meeting. Stations included thulium laser enucleation of the prostate (A), robotic water-jet treatment (B), morcellation (C), and holmium laser enucleation of the prostate (D).

enucleation of the prostate, and prostate morcellation. Each station sought to provide a wide range of exposure, incorporating numerous

prostate models (Figure 1), multiple lasers (spanning energy source type and industry vendors) as well as morcellators. For example, each

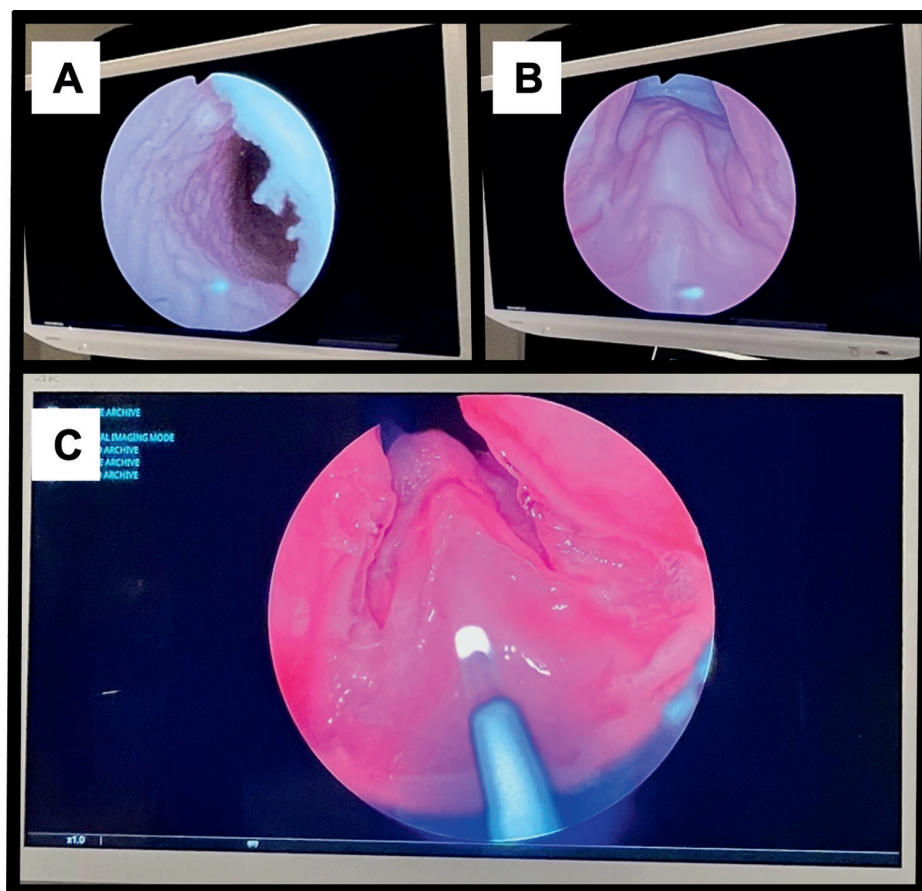


Figure 2. 3D-printed prostate gel models depicting laser enucleation plane between medial prostate adenoma and lateral capsule (A), proximal penile urethra (B), and verumontanum with proximal bladder neck (C).

participant had the opportunity to directly compare morcellator A to morcellator B in an ex vivo model using prostate surrogate bull testicles within a urinary bladder (tunica vaginalis and spermatic cord removed as previously described).² Faculty proctors successfully demonstrated and then evaluated participants with respect to morcellator setting understanding, scope setup, the safe handling of the morcellator, and troubleshooting the devices.

Similarly, participants were able to compare how different laser energies (holmium and thulium) interact with the prostate models. The surgical steps for multiple enucleation techniques were concurrently taught across the 6 enucleation stations (3 holmium, 3 thulium). Meanwhile, at the RWT station, participants received personal experience with placement of the urethral scope, robotic arm, and ultrasound probe. This was followed by outlining ablation zones on the monitor. To visualize and physically examine the prostatic urethral-ablating effect of the Aquablation water-jet treatments, treatment within an apple was performed.

As was recently highlighted by Deyirmendjian et al, despite prostate enucleation techniques demonstrating durable, safe, and effective outcomes for the past 20 years, training barriers and historically “steep learning curves” have only recently become targets of training-focused research, spurred on by the rapid evolution of 3D-printed models.^{3,4} This is illustrated by the use of several prostate gel inserts which allowed participants to landmark critical surgical anatomy, visualize distinct planes between prostate adenoma and capsule, and experience the physical scope force and technical movements required to combine lasering with blunt dissection in order to enucleate (Figure 2). As a subspecialty of urology that prides itself on surgical technology innovation and adoption, prioritizing the development of fast and cost-effective 3D-printed tissue models for future endourological research and training will be valuable. This will continue to support hands-on courses and improve safe access to training for motivated surgeons.

“As a subspecialty of urology that prides itself on surgical technology innovation and adoption, prioritizing the development of fast and cost-effective 3D-printed tissue models for future endourological research and training will be valuable. This will continue to support hands-on courses and improve safe access to training for motivated surgeons.”

Beyond the didactic and technical hands-on experience, this BPH surgical skills course also encouraged international networking and both constructive clinical and research discussions among the participants and faculty. At the conclusion of the course, the skills and connections that were developed will serve as a springboard for subsequent productive collaboration to improve BPH care. ■

Support: None.

Conflict of Interest: Dr Mark Assmus has no conflicts of interest to disclose. Dr Amy Krambeck is a consultant for Boston Scientific, Karl Sotrz, Uroprene, and Virtuoso Surgical, and is a board member for Sonomotion.

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AUA2023: REFLECTIONS

Ten Tips and Tricks to Reduce Radiation Exposure During Percutaneous Nephrolithotomy: The Life You Save May Be Your Own

Ala'a Farkouh, MD

Loma Linda University Health, California

Akin S. Amasyali, MD

Loma Linda University Health, California

Matthew I. Buell, MD

Loma Linda University Health, California

D. Duane Baldwin, MD

Loma Linda University Health, California

It is currently estimated that 1.5%-2% of cancers diagnosed in the United States are the result of medical ionizing radiation.¹ In addition to cancer, medical personnel with occupational radiation exposure have an increased risk of cardiovascular disease, cataracts, and inflammatory diseases including arthritis.²⁻⁴ Subsequently, it is important to reduce radiation exposure to patients and medical staff in accordance with the principles of ALARA (as low as reasonably achievable).

In a semi-live surgery presented at the 2023 AUA annual meeting, a hybrid percutaneous nephrolithotomy (PCNL) technique was demonstrated in a 60-year-old cirrhotic patient with a large renal pelvic and lower-pole stone burden. In this technique which combines ultrasound, low-dose fluoroscopy, endoscopic combined intrarenal surgery (ECIRS), and laser guidance, fluoroscopy time was dramatically reduced. In this recap, we summarize 10 steps that facilitated this high-risk, complicated PCNL.

1. Rely on tactile feedback for guidewire and ureteroscope insertion. First, the patient was placed in the prone split-leg position to allow flexible cystoscopy. By using a flexible cystoscope, an angle-tipped guidewire was inserted into the ureter and up to the kidney relying only on the surgeon's tactile feedback, without fluoroscopy (Figure 1, A). The wire passed smoothly along the ureter and an abrupt stop indicated the wire had contacted the stone, while a gentler, more bouncy resistance indicated the wire was correctly posi-

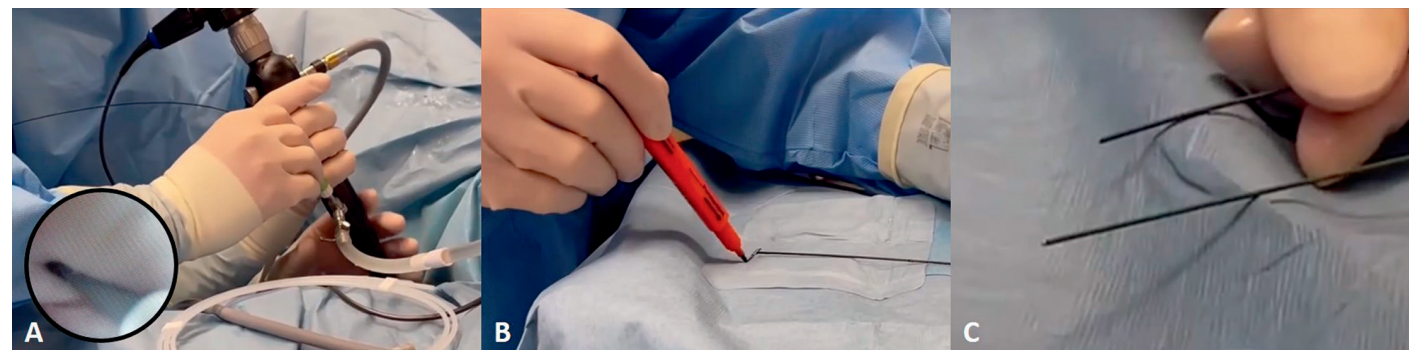


Figure 1. A, Angle-tipped guidewire is inserted into the ureter using tactile feedback. B, After angle-tipped guidewire is positioned in the kidney, its distal end is marked on the drape. C, The safety wire is positioned by comparing its position to the previously placed mark on the drape.

tioned in the upper pole. Using a marking pen, the external end of the wire was indicated on the drape (Figure 1, B). The guidewire was then switched for a double-floppy superstiff guidewire using a 5F open-ended catheter. A dual-lumen catheter was used to position a standard safety wire (Figure 1, C). Over the superstiff guidewire a fiber-optic flexible ureteroscope was inserted using tactile feedback and then passed up into the kidney using direct vision.

2. Use ultrasound to assess renal depth and delineate a safe zone. The depth of the kidney collecting system from the skin was assessed to select the appropriate needle length. In addition, ultrasound helped identify a posterior calyx by gentle deflection of the ureteroscope tip (Figure 2, A). Surrounding viscera including the spleen (Figure 2, B), the inferior pleural margin (Figure 2, C), and the bowel were identified and a safe zone was marked on the skin (Figure 2, D).

3. Use fluoroscopy only when necessary and in accordance with the ALARA principle. The fluoroscopy was first changed from automatic exposure control (30 pulses per second) to pulsed fluoroscopy at 1 pulse-per-second. The low-dose button was also depressed (Figure 3). The combination of these 2 changes reduces radiation dose by >90%. Saved

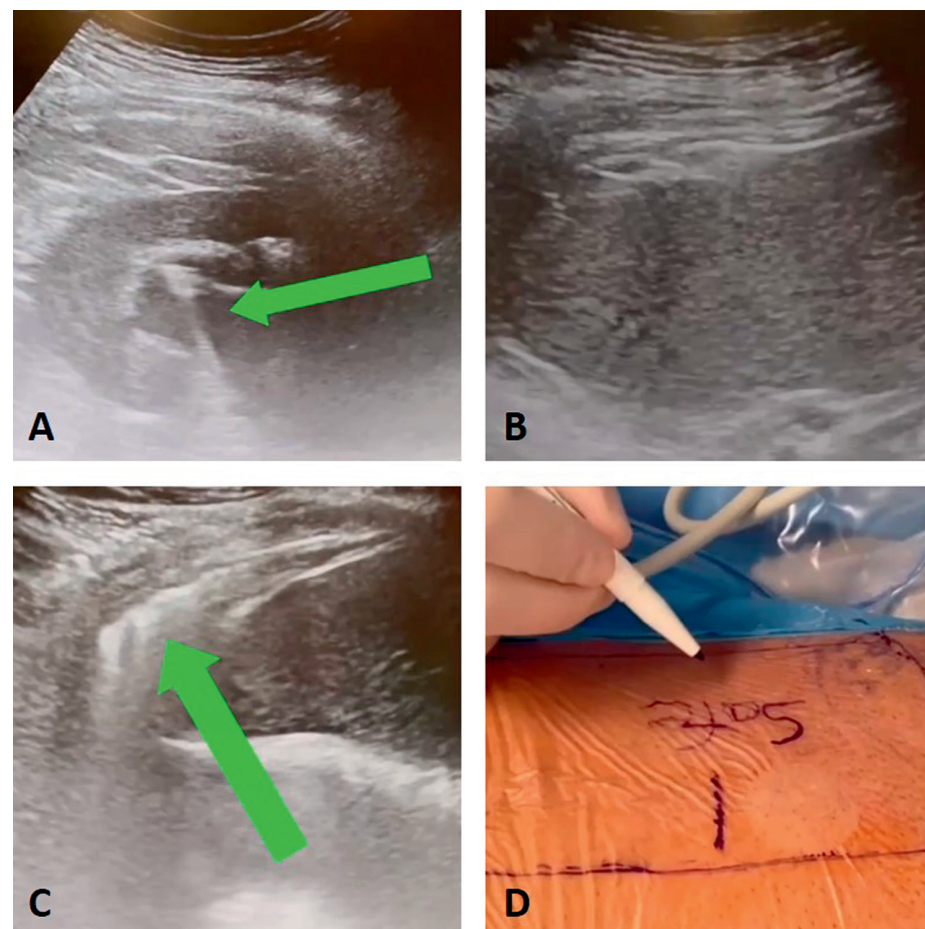


Figure 2. A, Tip of ureteroscope (green arrow) is seen in dilated posterior upper pole calyx. B, Enlarged spleen is identified. C, Pleural reflection (green arrow) is identified during deep inspiration to identify the lowest extent of the pleura to avoid transpleural puncture. D, Following ultrasound mapping, the surgeon is left with a safe zone marked on the skin of the patient.

images instead of live fluoroscopy were used to provide anatomical information.

4. Perform low-dose retrograde pyelogram. Although fluoro-less PCNL is possible, a retrograde pyelogram can clarify renal anatomy in a way not possible using ultrasound

alone. In this case, based on ultrasound and direct vision, the upper pole appeared to be an ideal access. However, the retrograde pyelogram demonstrated a bifid collecting system with a narrow infundibulum

TEN TIPS AND TRICKS TO REDUCE RADIATION EXPOSURE DURING PERCUTANEOUS NEPHROLITHOTOMY

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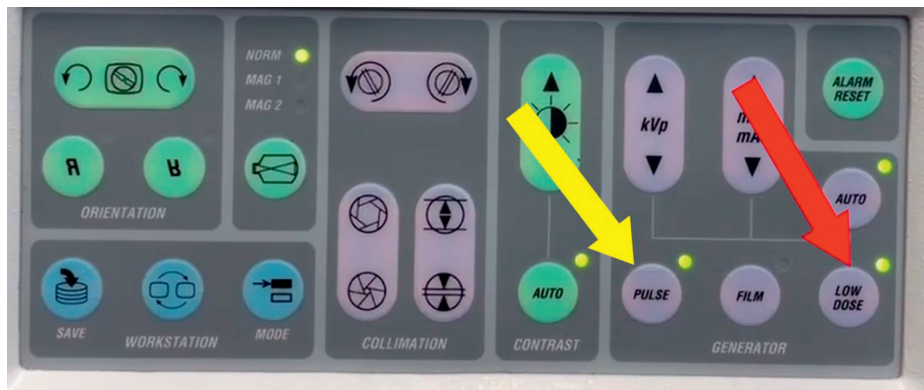


Figure 3. Choosing pulsed fluoroscopy (yellow arrow) and low dose (red arrow) on the C-arm settings.

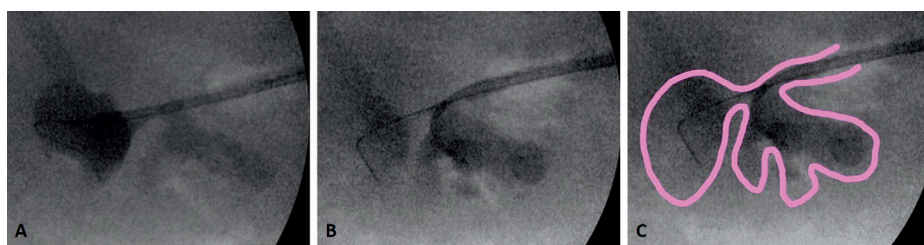


Figure 4. Retrograde pyelogram. A, Contrast filling dilated upper calyx. B, Contrast filling lower moiety of collecting system, revealing narrow infundibulum and bifid system. C, Two-dimensional outline of collecting system.

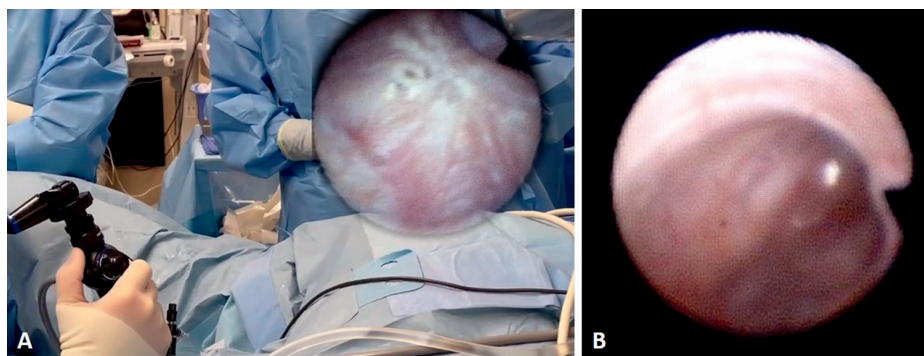


Figure 5. A, Use of ureteroscopy to identify a suitable calyx for access. B, Air bubble confirms it is a posterior calyx.

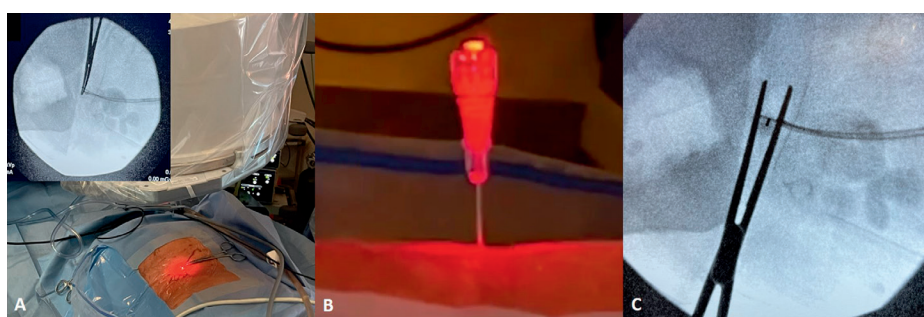


Figure 6. A, Tip of Kelly clamp is aligned with tip of ureteroscope and the laser. B, Laser illumination of the needle hub indicates proper needle alignment. C, A few intermittent taps of fluoroscopy can be used during needle insertion to confirm alignment.

(Figure 4). Subsequently, we needed an alternate access.

5. Employ ECIRS to improve safety and simplify access. Using the ureteroscope, a posterior upper midpole calyx with a wide and short infundibulum was identified (Figure 5, A). Injection of air confirmed this was a posterior calyx

(Figure 5, B). The ureteroscope tip was placed touching the papilla to allow for subsequent needle targeting.

6. Use the laser pointer on the C-arm image intensifier to guide needle insertion. With the ureteroscope tip in the desired calyx, a Kelly clamp was aligned using

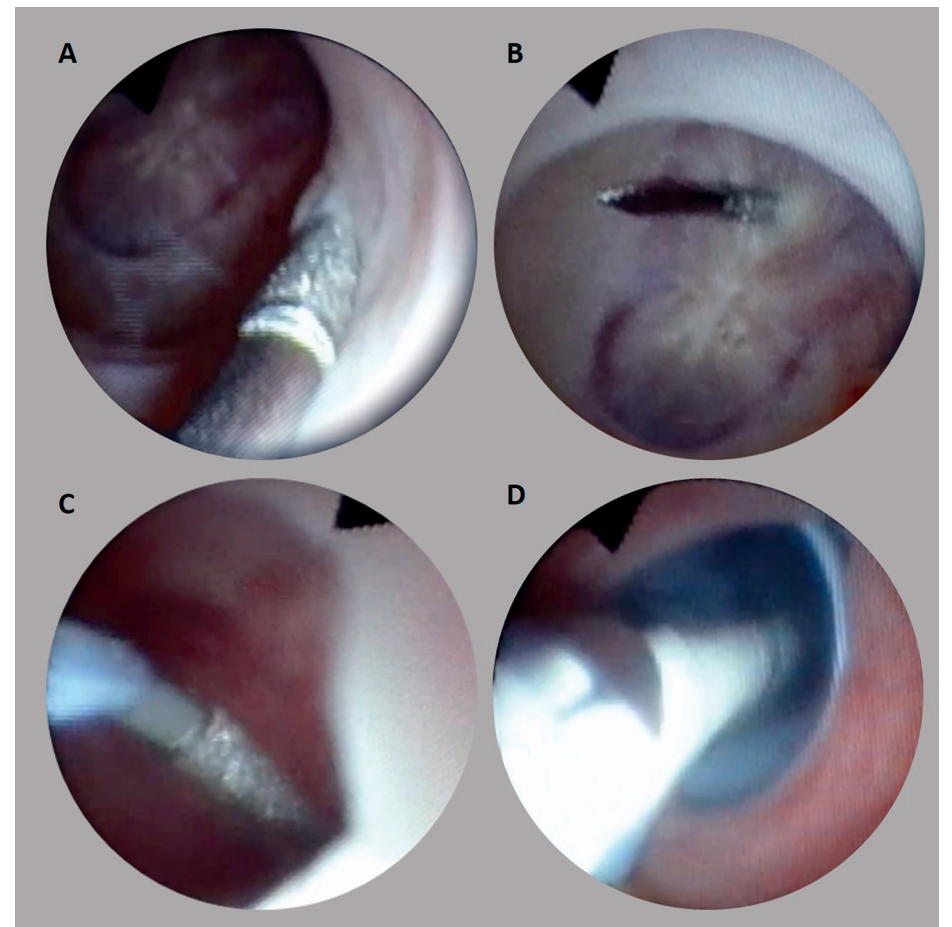


Figure 7. A, Needle inserted initially in infundibulum. B, Course correction under direct vision establishes papillary puncture. C, Through-and-through access established via ureteroscope. D, Sheath insertion to appropriate depth under direct vision.

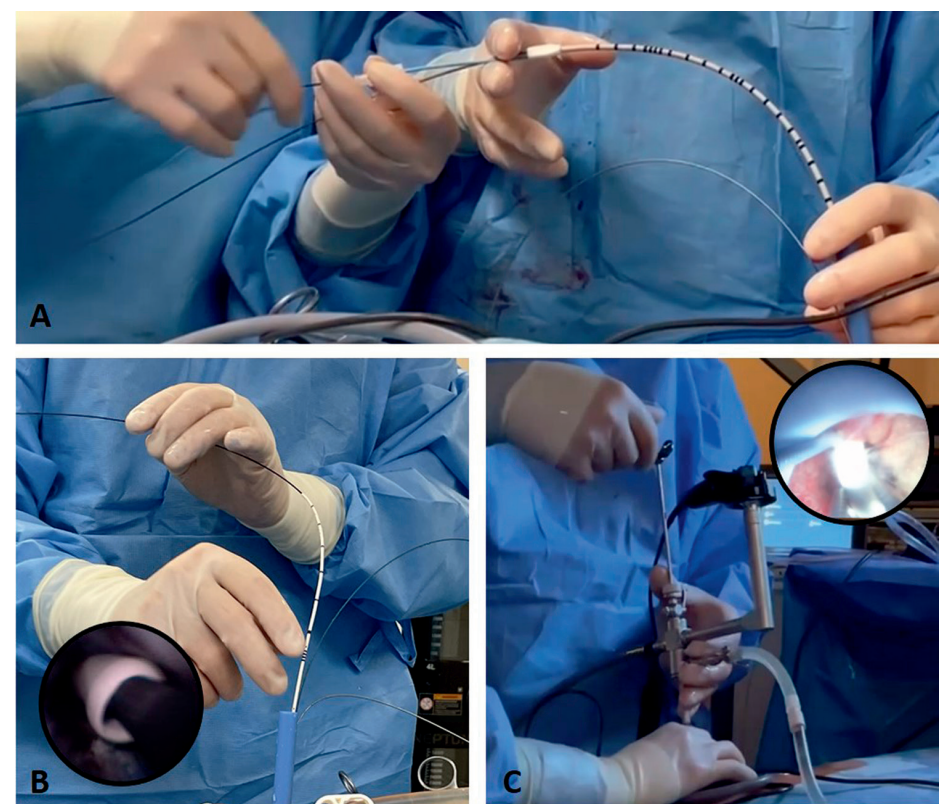


Figure 8. A, Glidewire inserted using dual-lumen catheter. B, Distal stent inserted under ureteroscopic vision. C, Proximal coil positioned via nephroscope.

a few taps of pulsed fluoroscopy. The tip of the Kelly clamp was positioned directly over the tip of the ureteroscope and the laser was

aligned with the tip of the clamp (Figure 6, A). This allowed the

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TEN TIPS AND TRICKS TO REDUCE RADIATION EXPOSURE DURING PERCUTANEOUS NEPHROLITHOTOMY

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surgeon to maintain alignment while inserting the needle (Figure 6, B) with only a couple of taps of pulsed fluoroscopy (Figure 6, C). This technique is called the “Laser Direct Alignment Radiation Reduction Technique (DARRT)”.

7. Utilize ECIRS for direct vision during needle insertion, course correction, balloon dilation, and sheath insertion. Having a ureteroscope in place in the kidney allowed direct visualization of needle insertion. In this case, the needle was in the collecting system, but was positioned in the infundibulum (Figure 7, A). Under direct vision, without additional fluoroscopy, the needle was repositioned to a papillary puncture (Figure 7, B). Through-and-through access was obtained (Figure 7, C), and tract dilation and sheath insertion were performed under direct vision (Figure 7, D). This removes the uncertainty of purely fluoroscopic or ultrasonic approaches and improves the precision and safety. Stone removal was accomplished in a traditional manner using an ultrasonic lithotripter. In addition, renal mapping using flexible endoscopy from above and below was performed.

8. Insert an antegrade double-pigtail stent without fluoroscopy. Following removal of all stone, the dual-lumen catheter was used to pass a guidewire into the bladder (Figure 8, A). Under direct ureteroscopic vision, the distal end of the stent was positioned in the bladder (Figure 8, B). The

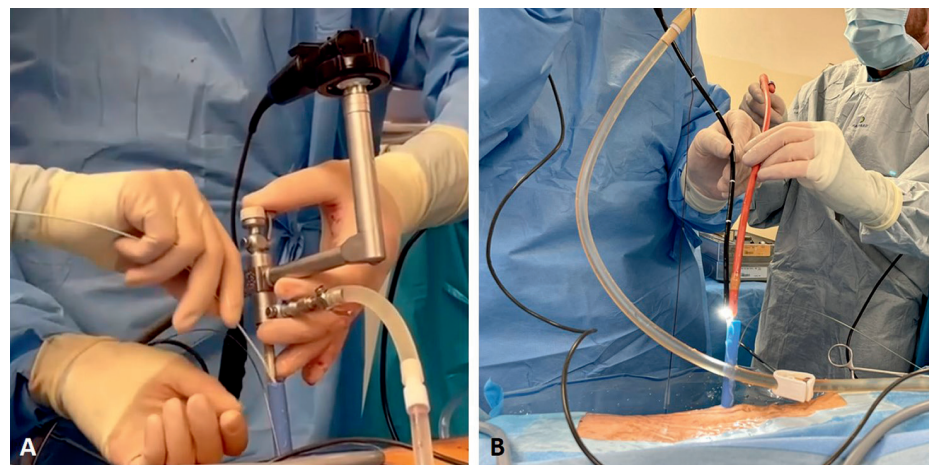


Figure 9. A, Multipurpose access catheter inserted into ureter. B, Depth of nephrostomy tube measured against the flexible nephroscope.

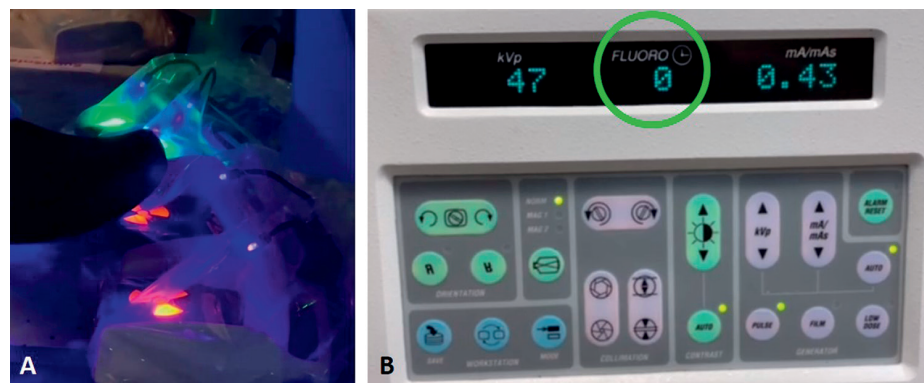


Figure 10. A, Lighted foot pedal to allow surgeon to control fluoroscopy activation and prevent inadvertent activation in the dark operating room. B, All C-arm machines report the fluoroscopy time during and after the procedure, which is tracked in the patient's chart.

proximal end was positioned under direct nephroscopic vision (Figure 8, C).

9. Insert nephrostomy under direct vision. Using the through-and-through wire, a 5F multipurpose access catheter was positioned in the ureter under nephroscopic vision (Figure 9, A). Next, the flexible

nephroscope was positioned in the renal pelvis with the tip of the scope in the desired location of the tip of the nephrostomy tube. A 22F council-tipped catheter was then inserted this same distance (Figure 9, B). At this point, 1 full dose fluoroscopy was used to look for any residual fragments.

10. Optimize all operating room conditions to minimize radiation usage. A dedicated radiology technician selected the optimal settings. The surgeon activated the C-arm using lighted foot pedals to prevent inadvertent activation in the dark environment (Figure 10, A). All forms of shielding were used and fluoroscopy times were tracked and reported (Figure 10, B).

The operative time in this complicated case was 3.5 hours and total fluoroscopy time was 12.1 seconds. The patient was discharged on postoperative day 1 with a stable hemoglobin of 13.8 mg/dL and was stone-free on low-dose CT. In this complicated cirrhotic patient, using this hybrid “Laser DARRT” technique, combining the optimal features of ultrasound, fluoroscopy, ECIRS, and laser guidance, this patient achieved an ideal outcome with an extremely low radiation exposure in accordance with the principles of ALARA. ■

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Mentorship in the Post-COVID Era

Eric Ballon-Landa, MD, MPH

Rocky Mountain Regional VA Medical Center,
Aurora, Colorado
CU Anschutz School of Medicine, Aurora, Colorado

My career as an attending urologist began in July 2020; a few months earlier, all nonessential activity was halted due to the SARS-CoV-2 pandemic. With the virus-induced physical isolation came additional costs, which were both well documented and widely shared by anyone starting their career at this time: a loss

of clinical collaboration outside of multidisciplinary tumor board conferences, a lack of spontaneous interaction with colleagues and mentors due to purely online medical conferences, and complete absence of ancillary activities and collaborative events deemed nonessential (eg, visiting professorships, professional development activities). This has since improved, yet like a child forced to cope with at-home schooling, my extracurricular career development

during the pandemic had somewhat stagnated.

Selection as a USMART (AUA Urology Scientific Mentoring and Research Training) Academy mentee offers the opportunity to advance my career development in the research domain. As a nonfellowship-trained urologist, I have broad clinical and academic interests, ranging from population-level disease screening, to public health and quality of care, geriatric and

older urology, and stone disease and advanced imaging. Additional mentorship from an outside perspective will allow me to hone my research portfolio and to develop connections with other programs and groups that would allow me additional opportunities for advancement.

My goals for research advancement in my career are 2-fold. First,

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MENTORSHIP IN THE POST-COVID ERA

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“Additional mentorship from an outside perspective will allow me to hone my research portfolio and to develop connections with other programs and groups that would allow me additional opportunities for advancement.”

I'd like to gain focus in my academic interests and build a more cohesive body of work, allowing me to contribute more to the field. Geriatric urology, and frailty in particular, unites my interests in palliative care within urology, bladder cancer quality of care, and functional outcomes related to urological malignancy. Frailty is increasingly an area of importance given that the burden of urological disease is

borne to a significant degree by the elderly; between 5% and 17% of this population can be qualified as frail, and as such any clinical intervention should aim to identify this before completing potentially risky and costly procedures with little promise of benefit (eg, PSA screening).¹ Our preliminary analysis of claims data has suggested that patients undergoing prostate biopsy are more likely to experience complications related to the intervention (unpublished data); others have examined different areas of urological disease and demonstrated similar findings.² Further work is necessary with regard to assisting the urologist in identifying the frail patient and leading a nuanced risk-benefit discussion within the limitations of a busy clinical practice.³

Another opportunity for advancing the care of geriatric urology patients lies in ensuring the availability of appropriate perioperative infrastructure needed for geriatric patients to succeed in surgery. My current primary practice site, the Rocky Mountain Regional VA Medical Center, is an accredited center of excellence for geriatric surgery (one of few sites nationally), and incorporates palliative care, social work, internal medicine and anesthesia cli-

nicians, and family members within weekly meetings to elucidate clear goals of care discussions and identify operative goals. These meetings, set up like a multidisciplinary tumor board, would feel familiar to most clinicians. The value of these is to identify perioperative and postoperative risks especially germane to the elderly, frail population and to mitigate them when possible with anticipatory action. Early outcomes have demonstrated reduced length of stay as a result of this intervention; urological-specific evaluations within this framework would identify potential avenues for surgical improvement.⁴

My second aim as a USMART mentee is to identify within my career my own ideal balance of research with the other pillars of clinical medicine, resident training, and student education. Given that I am still early within my career, there are many models for career growth which I have yet to be exposed to, whether achieving grant-based protected research time or focusing on clinical, quality-driven goals. No career model is the same, yet an outside perspective can help to clarify goals and identify opportunity for growth in any or all aspects of the classic tripartite aca-

“Another opportunity for advancing the care of geriatric urology patients lies in ensuring the availability of appropriate perioperative infrastructure needed for geriatric patients to succeed in surgery.”

demic mission of clinical medicine, teaching, and research. ■

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AUA2023: REFLECTIONS

Robot-assisted Kidney Transplantation: It Is Ready for Prime Time!

Giuseppe Basile, MD

Fundació Puigvert, Barcelona, Spain
Universitat Autònoma de Barcelona, Spain

Angelo Territo, MD, PhD

Fundació Puigvert, Barcelona, Spain
Universitat Autònoma de Barcelona, Spain

Jose Maria Gaya, MD

Fundació Puigvert, Barcelona, Spain
Universitat Autònoma de Barcelona, Spain

Alberto Breda, MD, PhD

Fundació Puigvert, Barcelona, Spain
Universitat Autònoma de Barcelona, Spain

Kidney transplantation (KT) is the gold standard treatment for pa-

tients with end-stage renal disease due to an established long-term survival benefit as compared to dialysis.¹ However, it is associated with a not trivial risk of perioperative morbidity, especially if considering that KT candidates are immunocompromised and frail patients at higher risk of developing postoperative sequelae.² Following the results achieved by minimally invasive surgery in other fields, the robot-assisted approach has been introduced in KT aiming at reducing perioperative morbidity

while improving surgical outcomes. Since the first robot-assisted kidney transplantation (RAKT) was reported in 2002, the surgical technique has been refined and standardized over the years through an extensive collaboration of highly experienced centers and surgeons in robotic surgery and KT. In this regard, the Robotic Urology Section of the European Association of Urology Working Group has led to a constant growth of scientific evidence on surgical and functional outcomes of the

procedure, improving its wider distribution in Europe.³

To date, RAKT showed comparable surgical (ie, rewarming time and time of vascular and ureteral anastomosis; see Figure) and functional outcomes to the open approach.⁴ Notably, several multicenter studies provided evidence regarding the optimal long-term functional outcomes of the graft after RAKT, and in a retrospective matched-pair analysis including

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ROBOT-ASSISTED KIDNEY TRANSPLANTATION: IT IS READY FOR PRIME TIME!

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126 and 378 robotic and open KTs Ahlwat et al reported no statistically significant difference in terms of delayed graft function (0% vs 2.4%, $P = .08$), graft rejection (16.2% vs 18.6% at 36 months, $P = .6$), and graft (95.2% vs 96.3% at 36 months, $P = .2$) and overall survival (94.5% vs 98.1% at 36 months, $P = .3$) between the 2 procedures.^{5,6} The robot-assisted approach has been also associated with several potential benefits as compared to the traditional open technique, including a lower rate of early and late postoperative complications, namely, wound infection, incisional hernia, and symptomatic lymphocele, as well as reduced postoperative pain.⁴ Furthermore, RAKT has been demonstrated to be effective in challenging cases such as obese patients in whom the open approach may also have a potentially detrimental effect. In particular, patients with a high BMI are those in whom the open approach may be strongly limited due to a restricted surgical field and technical difficulties in performing a safe and accurate vascular anastomosis as well as a higher predisposition to wound infection and incisional hernia. In such patients, RAKT showed no statistically significant differences in intra- and postoperative outcomes in patients with mild ($25 < \text{BMI} < 30$) or severe obesity ($\text{BMI} \geq 30$) as compared to fit patients.⁷ Similarly, RAKT has been reported to be feasible in grafts with multiple vessels since no statistically significant difference emerged in terms of timing of vascular anastomosis, cold ischemia, and rewarming time as well as intra- and postoperative complications as compared to surgeries performed using grafts with single vessels.⁸

Although there is increasing evidence that RAKT is as effective as the open approach, it is still considered a promising technique to be offered only in elective cases. Furthermore, the limited use of RAKT in daily clinical practice worldwide is related to several potential drawbacks including the difficulty in managing RAKT from deceased

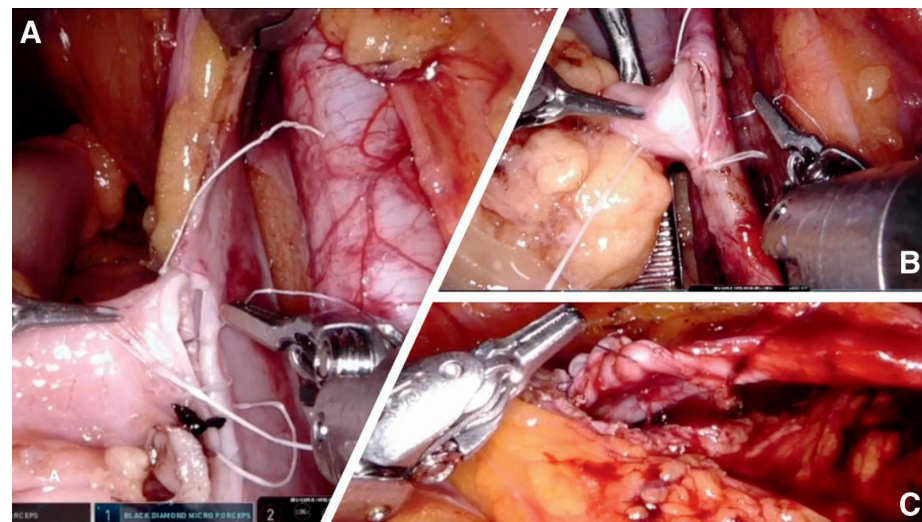


Figure. Surgical steps of robot-assisted kidney transplantation. A, End-to-side venous anastomosis between the renal vein and external iliac vein. B, End-to-side arterial anastomosis between the renal artery and external iliac artery. C, Lich-Gregoir ureteral reimplantation.

donors, the problem of temperature control of the graft during the rewarming phase, the lack of haptic feedback that could be useful in patients with diffuse atherosclerotic plaques of the vessels, and finally the possible demanding learning curve as compared to the open approach. To fill these gaps, the Robotic Urology Section of the European Association of Urology Working Group recently provided evidence that broke such existing dogmas regarding the limits of the robotic approach in KT. RAKT from deceased donors is certainly demanding for transplant teams from both technical and logistical standpoints; however, expanding the indications of RAKT to such cases is an unmet clinical need since it represents the most frequent source of grafts worldwide. In this regard, a first scoping study and a subsequent prospective observational study also assessed the feasibility of the procedure in this setting, showing similar surgical and functional outcomes as compared to living donors.^{9,10} Furthermore, with the aim to overcome the lack of regional hypothermia during RAKT as compared to the open approach where the kidney is usually kept below 20 °C during the procedure, to minimize the potential ischemic risk associated with the rewarming phase, novel systems of graft cooling have been

implemented, leading to a constant temperature control of the graft.¹¹ Regarding the limitations of the robotic approach in manipulating vessels with diffuse atherosclerotic plaques and the inability to have tactile feedback during the procedure, the implementation of 3D augmented-reality tools

“Although there is increasing evidence that RAKT is as effective as the open approach, it is still considered a promising technique to be offered only in elective cases.”

has been proven to be effective to help the surgeon perform a safe vascular anastomosis, also reducing the risk of plaque rupture and thrombus spread.¹² Finally, to reduce the learning curve of the procedure, standardized curricula based on proficiency-based progression methodology may help novel adopters reach satisfactory outcomes, although after 35 cases it is possible to reach optimal

surgical and functional outcomes, especially in well-trained robotic surgeons.¹³

In conclusion, although the open approach is still the standard of care in KT, RAKT is ready for prime time. A wider diffusion of experts on the technique and its implementation in deceased donors will allow us to reach more consistent results to clearly state which patient could benefit the most from robotic surgery also in KT. ■

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Conflict of Interest: The Authors have no conflicts of interest to disclose.

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AUA2023: PANEL DISCUSSION

Bladder Neck Contracture

Jill C. Buckley, MD, FACS
UC San Diego Health, California

At the AUA Plenary session this year we were asked to present a panel on bladder neck contractures (BNCs) and vesicourethral anastomotic stricture (VUAS). We presented numerous different types of management options: 2 endoscopic techniques and 2 robotic techniques. No one form of management will always prevail. The session started off by clearly delineating the difference between a BNC and a VUAS. BNCs are more straightforward, usually do not involve the external urinary sphincter (EUS; risk of incontinence is minimal to zero), are not radiated, and respond well to advanced techniques if primary dilation or incision fails. Dr Alex Vanni from the Lahey Clinic demonstrated the value of antifibrotic agents (mitomycin C) as an adjunctive to direct vision internal urethrotomy alone with excellent results for the treatment of BNC (>90%) and very good results for radiated VUAS (~75%) after 2 treatments.¹⁻³ He noted the dosing of mitomycin C was very important and should be used as described at 0.4 mg/mL and avoided at 12 and 6 o'clock.

Dr Nick Warner from the Mayo Clinic introduced the technique of a transurethral vertical incision and transverse mucosal realignment suture closure using a newly developed transurethral device.⁴ He reported results greater than 90% in BNC and VUAS proximal to the external urinary sphincter (EUS). He noted this is not for transmembranous strictures, obliterations, or radiation calcification. This is an exciting new technique to successfully manage BNC/VUAS.

In the robotic space, Dr Ziho Lee from Northwestern described robotic-assisted BNC reconstruction using a YV plasty for short >10F contractures and a complete excision and anastomosis for <10F contractures. Robotic series such as those from TURNS, which include BNC and the more challenging VUAS and radiated VUAS, showed a >75% success.⁵ For those studies focused exclusively on BNC, robotic repair success rates are higher, at >90%-100%.⁶ The key difference is, although obliterated or recurrent, BNC tissue is relatively healthy and free of the additional wound healing complication associated with radiation. Dr Boyd Viers from the Mayo Clinic spoke on VUAS, the most chal-

lenging of the group, especially the radiated VUAS, and demonstrated how robotic-assisted surgery is the most effective technique in terms of visualization, magnification, and surgical repair. He emphasized the preoperative assessment which includes retrograde urethrography, cystoscopy, and an MRI in complex posterior stenosis/VUAS (distraction injury). Benefits of the robotic abdominal approach include preserving the EUS when stenosis is proximal to this area and patency outcomes >75% or greater depending on if the tissue has been radiated or not.⁷⁻⁹

Patients can be cured from refractory BNC and VUAS (radiation-induced included) using the various techniques described above. What is fantastic to see is the various treatment options that are tailored to the patient. With direct comparative studies, we will be able to compare technique to technique, assessing outcomes, side effects, cost, patient experience and recovery, and overall health care resource utilization. With many new and improved techniques over historical dilation or urethral incision alone, our ability to treat and cure these challenging conditions has grown exponentially

and changed patients' lives for the better. ■

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AUA2023: REFLECTIONS

Pediatric Plenary Cross Fire Debate: Controversies in Vesicoureteral Reflux Management

Christina Ching, MD
Nationwide Children's Hospital, Columbus, Ohio

Erin McNamara, MD, MPH
Boston Children's Hospital, Massachusetts

Antoine Khoury, MD
Children's Hospital of Orange County, University of California Irvine

Vijaya Vemulakonda, MD
Children's Hospital Colorado, Aurora

Julian Wan, MD
C.S. Mott Children's Hospital, University of Michigan, Ann Arbor

Nowhere in pediatric urology is a topic as heavily debated as vesicoureteral reflux (VUR). Despite being quite a common finding, found in up to 30% of children with a history of urinary tract infections,¹ there is a fair amount of controversy as to its workup and management. As such, the topic lent itself nicely to a friendly debate kicking off the Sunday morning plenary session of the 2023 AUA Annual Meet-

ing in Chicago. It was a cold and rainy morning on April 30, from which urologists in attendance of the AUA could warm up through the heated discussion that arose as Drs Erin McNamara of Boston Children's Hospital, Tony Khoury of Children's Hospital of Orange County, Vijaya Vemulakonda of Children's Hospital Colorado, and Julian Wan of C.S. Mott Children's Hospital at the University of Mich-

igan took strong stances on either side of 3 tough clinical scenarios involving VUR. Christina Ching of Nationwide Children's Hospital of Columbus, Ohio, had the pleasure of moderating.

In the first scenario, we specifically discussed care in those with VUR found upon workup for abnormal prenatal imaging as opposed to

PEDIATRIC PLENARY CROSS FIRE DEBATE: CONTROVERSIES IN VESICoureTERAL REFLUX MANAGEMENT

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“We discussed how distal ureteral width may impact one’s decision to evaluate for VUR, with a 7-mm or more cutoff helping identify those patients in whom a voiding cystourethrogram should be performed and antibiotic prophylaxis initiated.²”

that found as a result of urinary tract infections. We discussed how distal ureteral width may impact one’s decision to evaluate for VUR, with a 7-mm or more cutoff helping identify those patients in whom a voiding cystourethrogram should be performed and antibiotic prophylaxis initiated.²



Figure. Controversies in Vesicoureteral Reflux Management cross fire moderator and panelists.

In the second scenario, we discussed the contribution of bowel and bladder dysfunction to the complexity of VUR and how this can impact the plans for surgical intervention.³ There was agreement that bowel and bladder dysfunction should be managed aggressively as much as possible prior to any more invasive treatment, as its poor management can alter the outcome of surgery.

In the third scenario, we discussed uncorrected VUR in a teenage female with considerations related to follow-up and potential

impact during pregnancy.⁴ There was general acknowledgment that such a patient needed continual monitoring and it was imperative the patient establish a good relationship with a medical provider as they continue to transition to adulthood. The importance of monitoring renal health in one at risk for or with known reflux nephropathy is necessary. This includes regular blood pressure monitoring, annual urinalysis, blood work (when necessary), and nephrology referral. Another important theme of this scenario was informed

decision-making between urologist, patient, and patient family.

In summary, the outcome of the AUA2023 cross fire debate on VUR highlighted the importance of nuanced care and demonstrated the complexity of a diagnosis of VUR. Not all VUR in children is the same; and even within any one patient, VUR can be a dynamic process. Ultimately, patient-tailored care is important with an assessment of risk factors beyond just that of the finding of VUR alone. Close attention should be paid to the clinical context of having found VUR and the needs of the patient and their family. ■

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AUA2023: REFLECTIONS

Temporary Implantable Nitinol Prostate Stent for Benign Prostatic Hyperplasia

Alia Codelia-Anjum, BS

NY-Presbyterian Hospital, Weill Cornell Medical Center, New York, New York

Dean Elterman, MD, MSc, FRCS

University Health Network, University of Toronto, Ontario, Canada

Kevin Zorn, MD, FACS, FRCS

Centre Hospitalier de l’Université de Montréal, Quebec, Canada

Naeem Bhojani, MD, FRCS

Centre Hospitalier de l’Université de Montréal, Quebec, Canada

Silvia Secco, MD, FEBU ASST

Ospedale Metropolitan Niguarda, Piazza Ospedale Maggiore, Milan, Italy

Bilal Chughtai, MD

NY-Presbyterian Hospital, Weill Cornell Medical Center, New York, New York

The minimally invasive space for benign prostatic hyperplasia (BPH) has been a hot topic with a plethora of novel technologies being presented in multiple AUA sessions this year. In efforts of moving BPH procedures further along in terms of high efficacy and increasing the safety profile, the temporary implantable nitinol device (iTIND), has been one of the first players on the market offering an easily reproducible procedure, requiring no permanent foreign body or use of energy.

The iTIND was US Food and Drug Administration approved in 2020; it is designed to permanently

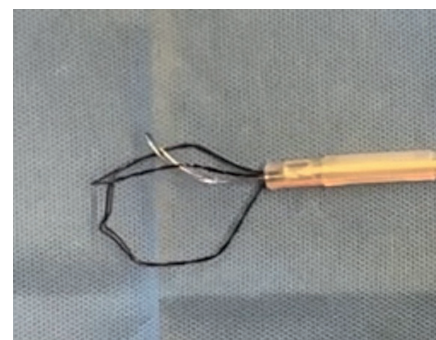


Figure. Implantable nitinol device in its expanded form.

remodel the prostatic urethra during a temporary implantation period of only 5 to 7 days (see Figure). It is a single-use device supplied on a ded-

icated delivery system consisting of 3 nitinol cutting struts at the 12, 5, and 7 o’clock positions, an anchoring leaflet at the 6 o’clock position to prevent device migration, and a retrieval suture anchored to the distal part of the device. The cutting struts result in deep, bloodless incisions created through ischemic pressure. The subsequent necrosis permanently remodels the prostatic urethra and bladder neck. At the end of the treatment period (5-7 days), the device is completely removed through a silastic open-ended catheter.

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TEMPORARY IMPLANTABLE NITINOL PROSTATE STENT FOR BENIGN PROSTATIC HYPERPLASIA

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In a recent animal study, 3 canines underwent placement of the cTIND, a modified iTIND device meant for use in canine models, to further understand its mechanism of action and the changes it induces to the bladder neck and prostatic urethra.¹ The histologic findings after device implantation showed targeted areas of necrosis with no edema, minimal inflammation, and minimal injury to the surrounding prostatic tissue.

The ideal candidate for iTIND is a patient with a prostate volume of 25-75 cc, no obstructive median lobe, a high bladder neck, and good bladder function.² Insertion and removal of the iTIND can be performed either in the operating room setting using IV sedation or in an in-office setting using local anesthesia or sedation. The iTIND may be placed via rigid cystoscopy or flexible cystoscopy.

In a randomized, multicenter

study of 175 men by Chughtai et al, 118 patients received iTIND after a washout period of 1 month for α blockers and 6 months for 5-alpha reductase inhibitors.³ This included men with prostate volumes between 25 and 75 cc with no obstructive median lobe, a high bladder neck, and good bladder function. At 3-month follow-up visit, iTIND patients showed a reduction of more than 3 points in International Prostate Symptom Score (IPSS) with a rate of 79% when compared to the sham group of 60%. At the 12-month follow-up, the iTIND group's maximum flow rate improved by 41.8% and quality of life improved by 42.2% when compared to baseline scores. While adverse events (AEs) occurred in 38.1% of the iTIND group vs 17.5% in the control, most AEs were a Clavien-Dindo grade of I or II. Additionally, 68% of AEs occurred within 7 days of treatment,

while the device was in the body, and the most common AEs were dysuria and hematuria. Furthermore, when compared to other minimally invasive treatments, iTIND showed comparable improvement in IPSS and peak flow rate with a similar re-intervention rate of 4.7% to other iTIND studies.

In the longest-term study with 3 years of follow-up, 81 men with symptomatic benign prostatic obstruction were treated with iTIND.⁴ At 3-year follow-up, data were available for 50 patients, which showed a decrease in IPSS by 58.2%, improvement of maximum flow rate by 114.7%, and postvoid residual improvement by 85.4%, showing significant difference when compared to baseline assessment. The most common complications were hematuria (12.3%), urgency (11.1%), pain (9.9%), and dysuria (7.4%). All complications were a Clavien-Din-

do grade of I or II and resolved within 30 days, with no late post-operative AEs occurring after 12 months. Throughout the 3 years of follow-up, no sexual or ejaculatory dysfunction was reported.

With an interest for minimally invasive and effective treatment options for BPH, the iTIND has become an increasingly popular and comprehensive means to address these needs. ■

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Working Toward Deriving Regenerative Treatment Options for Males With Nonobstructive Azoospermia

Ryan Flannigan, MD, FRCSC

University of British Columbia, Vancouver, Canada
Weill Cornell Medicine, New York, New York

While most male infertility can be overcome by in vitro fertilization-intracytoplasmic sperm injection where sperm are injected directly into oocytes for fertilization, males who lack sperm production, such as many pediatric cancer survivors, cannot utilize this therapy since they do not produce sperm even as an adult due to their cancer therapy.

This is particularly relevant since the forward progress among our oncology colleagues in effectively treating cancers through combinations of targeted therapies has resulted in an estimated 83% survival among all boys diagnosed with cancer aged less than 15.¹ However, many of these therapies inflict significant and often irreversible gonadal damage. Specifically, germ cells (ie, spermatogonial stem cells) are particularly sensitive to chemotherapy and radiation therapy, and azoospermia rates may range between 19% and 97% of cancer survivors.^{2,3} These numbers are con-

cerning since 75% of male childhood cancer survivors will report desiring to father children of their own in the future,⁴ and sperm cryopreservation from ejaculated samples is not possible for pre-pubertal boys since spermatogenesis has not begun prior to puberty. However, spermatogonial stem cells populate the testis in pre-pubertal boys; thus, fertility preservation strategies are limited to testis biopsies and subsequent cryopreservation with hopes of the future development of a technology to regenerate spermatogenesis. In a recent study, most respondents were in favor of undertaking experimental interventions in hopes of preserving fertility despite the risks of complications, costs of banking tissue, and chance of new technological advances.⁵ Unfortunately, to date, no regenerative approaches for inducing sperm production in humans have been repeatedly successful, despite encouraging success in animal models.

To address this, our RegenerAIT (Regenerative and Advanced Infertility Therapeutics) program aims to help these males with nonobstruc-

tive azoospermia with no detectable sperm in the semen or with microdissection testicular sperm extraction. To accomplish this, we have constructed a highly interdisciplinary team of clinicians, biologists, computational biologists, and engineers to develop the technologies and processes working toward in vitro spermatogenesis. In our project recently supported by the AUA Rising Stars Competition, we will be integrating several levels of technology and experimentation. We will be using computational analyses of single-cell RNA sequencing data from human testis tissue to understand the somatic environment that coordinates the temporal and spatial regulation of human spermatogenesis in vivo, as well as the transcriptional events contributing to germ cell differentiation. These findings will subsequently be tested on human 3D organoids and 3D bioprinted tubules to assess function and impact on germ cell differentiation. Collectively, these technologies will integrate into a precision medicine pipeline aimed toward regenerating sperm production

in vitro to be subsequently coupled to existing clinical workflows such as in vitro fertilization-intracytoplasmic sperm injection.

It has been an honor to receive this award and I am extremely grateful for the opportunity, support of my mentors, colleagues, and collaborators. It will be extremely helpful in supporting my career to dedicate additional time performing translational research activities relevant to this project that aims to develop novel therapies for males with nonobstructive azoospermia. ■

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AUA2023: REFLECTIONS

Hands-on Urological Ultrasound Course 2023

Pat Fox Fulgham, MD, DABU

Urology Research & Education Foundation, Dallas, Texas

Despite the fact that advanced imaging techniques are assuming increasing importance in the management of urologic patients, ultrasound remains a vital component of both diagnosis and treatment.¹ The “Hands-on Urologic Ultrasound” course (101HO) was presented April 27 in Chicago for the 25th year. If the participant completes the precourse didactic component and successfully demonstrates the skills outlined in the hands-on course objectives, they are awarded a total of 16.5 hours of American Medical Association Physician’s Recognition Award category II continuing medical education credit.

The longevity and popularity of the course is explained by a precourse didactic segment consisting of comprehensive instruction in the physics and technique associated with each of the most common procedures performed by urologists in their clinical practice. The hands-on portion of the course uses human models (which is unique among the hands-on imaging courses offered) to acquire the skills necessary to perform and document a quality examination (Figure 1).² The instructors are all clinical urologists with many years of practical experience.



Figure 1. Course faculty guides participant in the performance of transabdominal ultrasound.

This course is characterized by a physics-based approach and makes optimization of imaging a priority. The course provides training which includes ethical patient selection, image documentation, and appropriate selection of imaging category (eg, limited vs complete). These are skills that are required to produce optimal examinations to answer specific clinical questions which are encountered in office patients. These same skills can be applied directly to any other specific diagnostic or therapeutic procedure in which ultrasound plays a role (eg, platform-based fusion biopsy of the prostate, focal ablation of renal and prostate tumors).

The course is intended to train the health care provider in the effective use of ultrasound (whether a urologist or an advanced practice provider associated with the urologist). The course has proven valuable for residents, academicians, and those in private practice settings. Previous participants have taken this training back to their clinical practice and report the course improved their practice.

“Almost 20 years ago I had the privilege of attending the AUA Ultrasound Course with Dr Pat Fulgham as course director and instructor. Prior to this course, my ultrasound experience was limited only to transrectal ultrasound which I used almost exclusively for prostate biopsies. This comprehensive course provided the cognitive and technical skills to allow me to introduce renal, bladder, and testicular ultrasound into my practice. With these new skills I brought great value to my patients who were delighted to get their imaging and treatment in one place. I remain grateful to Dr Fulgham and the AUA for this transformative experience.”

Jaime Landman, MD, FRCS, professor of urology and radiology; endowed chair in urologic surgical oncology; chair, department of urology

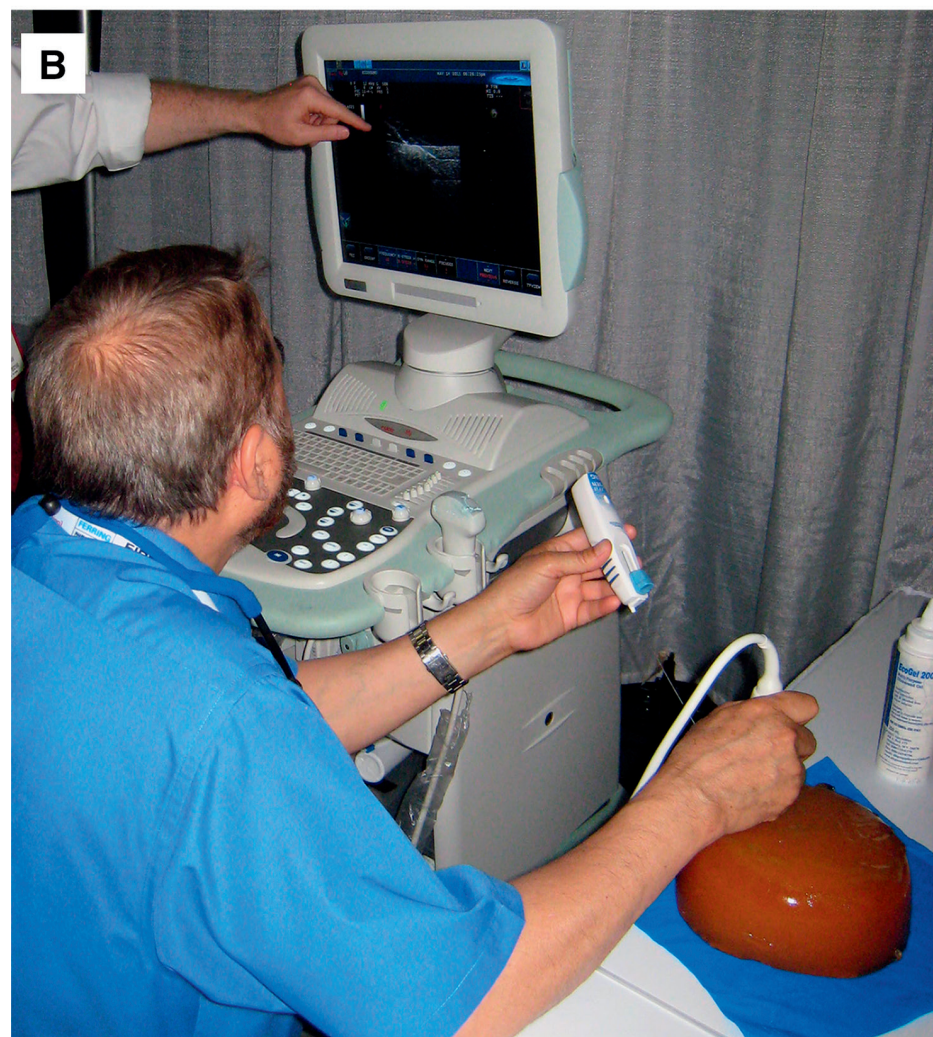
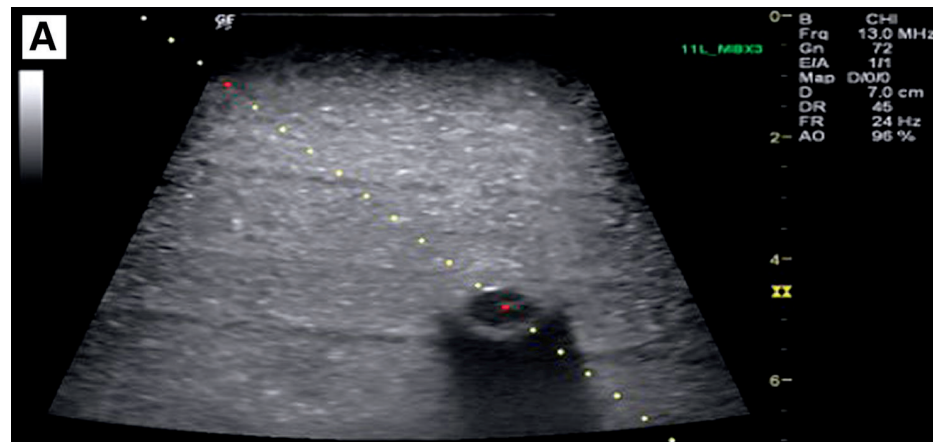


Figure 2. A, Phantom containing olive which is the target for ultrasound-guided biopsy. B, Course participant using ultrasound to guide the needle to biopsy the olive within the phantom.

“Bedside ultrasound in my pediatric urology clinic has been a defining component of my practice. It allows for real-time diagnostics, convenience for both the doctor and patient, as well as a stronger relationship with those we care for. Most urologists aren’t exposed to office ultrasound beyond [transrectal ultrasound] during training. The AUA ultrasound course

gave me the confidence and skill set to provide a service that sets my practice apart from others.”

Israel P. Nosnik, MD, pediatric urologist, Children’s Health

Specific technical training in the performance of renal, transabdominal prostate and bladder, and scrotal

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HANDS-ON UROLOGICAL ULTRASOUND COURSE 2023

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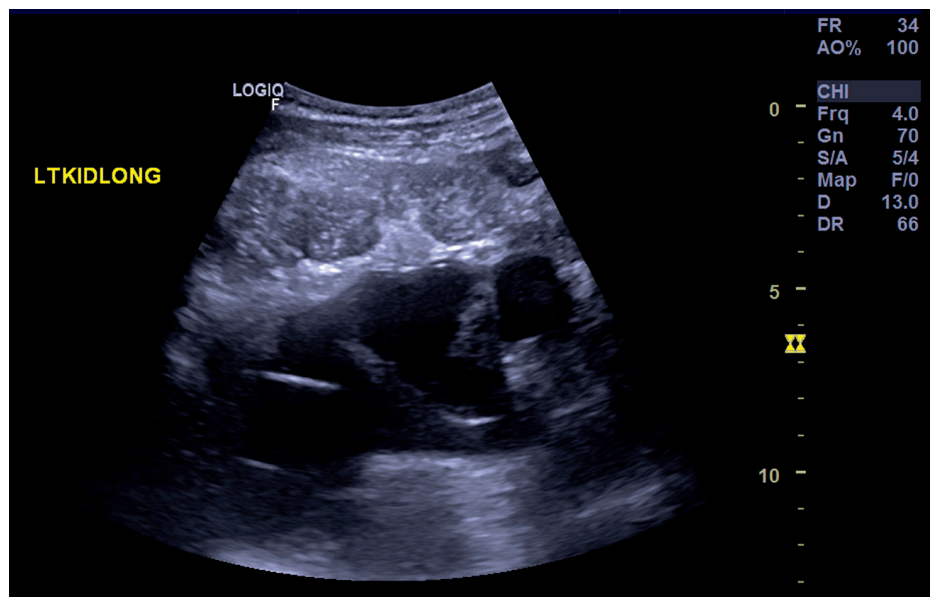


Figure 3. Renal ultrasound image demonstrating hydronephrosis.

examinations is offered. Human models are used to teach specific examinations, and gel phantoms are used to demonstrate ultrasound artifacts and to practice ultrasound targeting and biopsy of objects. The phantom includes a renal phantom and other objects (Figure 2, A and B). Multiparametric ultrasound is emphasized with a discussion of techniques using Doppler ultrasound, contrast-enhanced ultrasound, and elastography.

A major focus of this course is the ethical use of ultrasound to answer specific clinical questions. For example, renal ultrasound may be used with excellent sensitivity to exclude hydronephrosis in the follow-up of ureteroscopic procedures (Figure 3).³ Instruction in

the selection of the proper procedure and coding and documentation of each exam were provided.

Based on the AUA/SUFU (Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction) Guideline for Microhematuria published in 2020,⁴ a patient who presents to the office with low- or intermediate-risk microscopic hematuria may be completely evaluated by cystoscopy and point-of-service renal ultrasound in a single visit. This provides great value to the patient in terms of time savings and immediacy of results. “In low-risk patients with microscopic hematuria, clinicians should engage patients in shared decision-making to de-

“Bedside ultrasound in my pediatric urology clinic has been a defining component of my practice. It allows for real-time diagnostics, convenience for both the doctor and patient, as well as a stronger relationship with those we care for. Most urologists aren’t exposed to office ultrasound beyond [transrectal ultrasound] during training. The AUA ultrasound course gave me the confidence and skill set to provide a service that sets my practice apart from others.”

cide between repeating [urinalysis] within 6 months or proceeding with cystoscopy and renal ultrasound. (Moderate Recommendation; Evidence Level: Grade C).”

Obstructive voiding symptoms may be investigated by transabdominal ultrasound of the pelvis. This technique provides excellent anatomical resolution of the bladder and prostate, giving information about the size and morphology of the prostate (Figure 4). This information, in turn, may inform the urologist about the optimum interventions for managing bladder outlet obstruction.

Most urologists perform some form of ultrasound in practice, with transrectal ultrasound being the most commonly performed procedure. Data from the American Board of Urology (ABU) surgical logs from 2012 to 2014 were reviewed to evaluate the utilization of nonprostate ultrasound. The data from 2,427 urologists submitting case logs for certification or recertification to the ABU for those years revealed 43% submitted codes for at least 1 renal, scrotal, or penile ultrasound.⁵ Similar data from ABU case logs of 6,049 urologists from 2015 to 2022 showed that 53.1% of urologists submitted codes for nonprostatic ultrasound. There is clearly an increasing need for ongoing postgraduate training in urological ultrasound.

As imaging continues to evolve in complexity, high-quality ultrasound examinations remain a vital component of the diagnosis and treatment of urology patients. Providers must stay abreast of innovations in multiparametric ultrasound to support effective and efficient examinations if our patients are to derive the maximum benefit from our interventions. ■

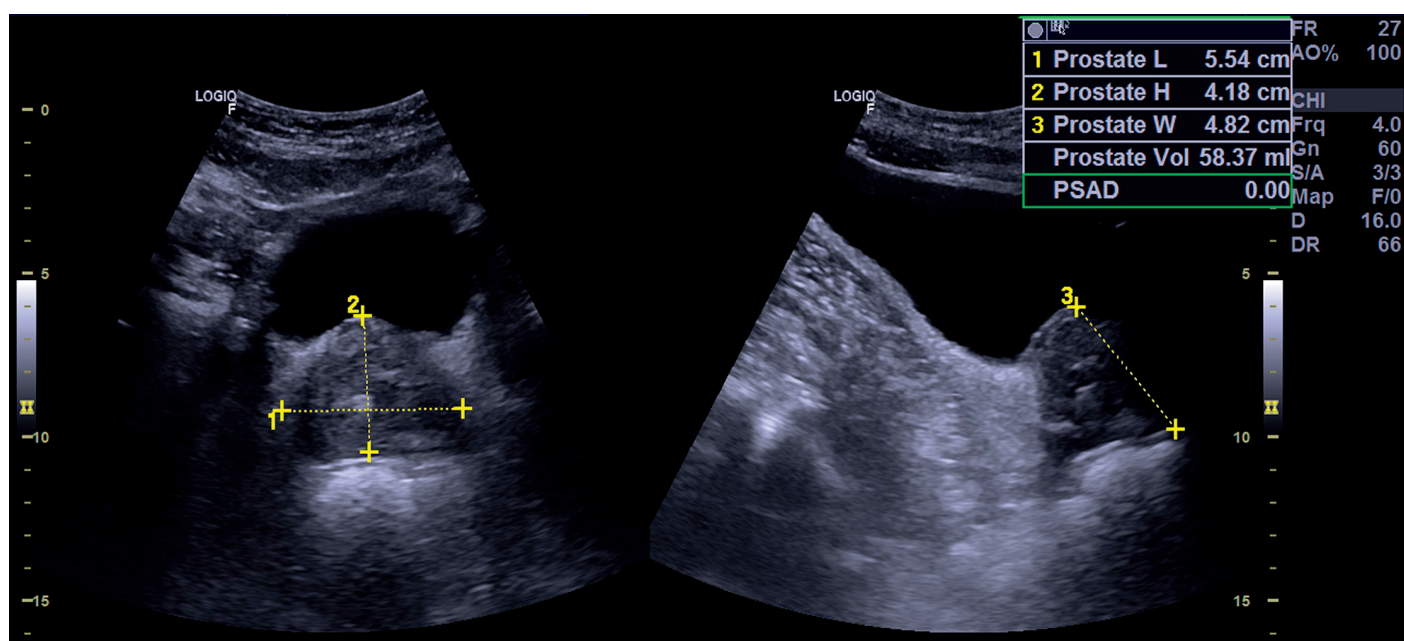


Figure 4. Transabdominal ultrasound image demonstrating measurement of prostate volume.

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Photonic Lithotripsy: Utilizing Engineered Nanoparticles for Kidney Stone Fragmentation

Smita De, MD, PhD

Cleveland Clinic, Ohio
Lerner College of Medicine, Cleveland, Ohio

I am honored to have been accepted into the AUA Urology Scientific Mentoring and Research Training (USMART) program and was delighted to meet my mentor, Dr Brant Inman from Duke University, in person at the 2023 AUA Annual Meeting in Chicago. As an endourologist, prostate enucleation enthusiast, and bioengineer, I have a large breadth of research interests relating to benign prostatic hyperplasia and kidney stones, with a strong focus in translational studies and novel technologies. One of my goals during this year in the USMART program is to work closely with Dr Inman to successfully pursue external funding to support my collaborative research project in developing a new technique for lithotripsy using nanotechnology.

Kidney stones affect almost 1 in 10 individuals in the US¹ and are associated with significant morbidity and even mortality.² Unfortunately, current surgical treatments for kidney stones have poor success rates and are associat-

ed with a number of risks.³ I have established a collaboration with Vijay Krishna, PhD, at Cleveland Clinic, an expert in nanomaterials, and we, along with our NIH training grant-funded postdoc, Ian Houlihan, PhD, have demonstrated the ability to fragment kidney stones in vitro using a novel technology called photonic lithotripsy. In photonic lithotripsy, kidney stones are coated with engineered nanoparticles, specifically polyhydroxy fullerenes (PHFs), which are activated by noncontact coherent light waves. The light activation, which can be performed with various low-intensity near-infrared lasers, causes the nanoparticles to produce tiny, localized vibrations or mechanical bursts that then fragment the kidney stones. During photonic lithotripsy, stones do not have to be touched or, potentially, even visualized. By creating the energy for stone fragmentation at the surface of the stone rather than the energy traveling through healthy tissue (like shock waves) or fragile ureteroscopes, photonic lithotripsy could possibly reduce procedure time and complexity, minimize risk of injury to tissues, improve



Figure 1. Examples of human kidney stones before (top row) and after (bottom row) photonic lithotripsy. Engineered nanoparticles coating the stones were activated with a noncontact 785-nm laser at 2 W for 3 minutes from a distance of up to 2 cm. Some color changes in the treated stones are due to the color of the nanoparticle solution. PHF indicates polyhydroxy fullerenes.

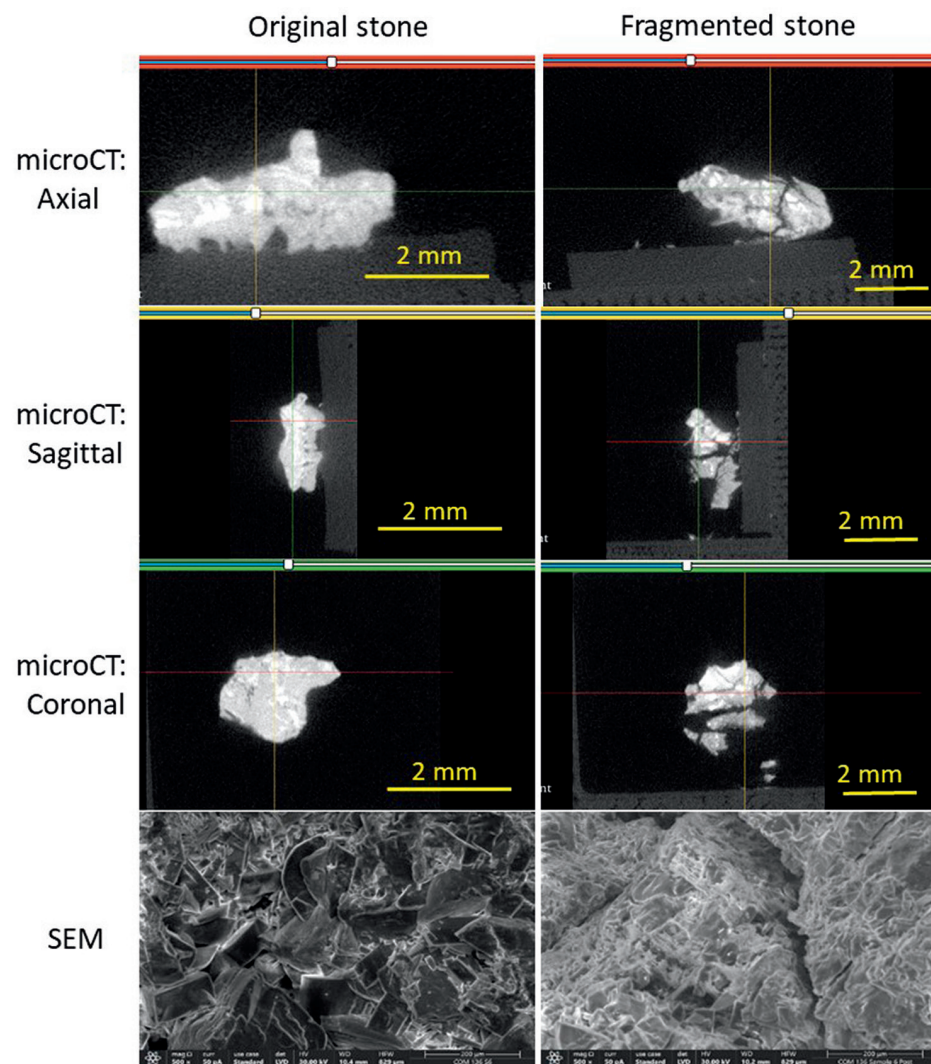


Figure 2. Microcomputed tomography (microCT) and scanning electron microscopy (SEM) images of the same calcium oxalate stone before (left) and after (right) fragmentation with photonic lithotripsy using a noncontact 1,320-nm laser at 3.5 W. Note crack formation in the microCT images and restructuring of the stone surface in the SEM images after photonic lithotripsy.

surgeon ergonomics, increase surgical success rates, and decrease the need for radiation.

Using internal grant funding and philanthropic donations through the Cleveland Clinic Foundation, we have completed proof-of-concept studies showing successful stone fragmentation using photonic lithotripsy (examples shown in Figure 1). Deidentified human kidney stones were acquired from our pathology department after obtaining Institutional Review Board approval. We performed in vitro photonic lithotripsy by coating the stones with PHF nanoparticles and activating the PHFs using different combinations of near-infrared laser wavelengths, laser settings, and laser distances. All common stone types including calcium oxalate monohydrate, calcium oxalate dihydrate,

calcium phosphate, and uric acid stones were successfully fragmented using low-intensity laser energy (2-3.5 W) at a distance of 1-2 cm. We have additionally performed scanning electron microscopy, microcomputed tomography, and Fourier transform infrared spectroscopy of stone specimens before and after photonic lithotripsy to characterize the mechanical and thermal effects during treatment (Figure 2).

Our team's goal is to spend the next few years better understanding the mechanism of stone failure during photonic lithotripsy (ie, quantify mechanical energy produced by the nanoparticles and any thermal effects), optimizing its parameters, and performing animal studies to evaluate its safety

PHOTONIC LITHOTRIPSY: UTILIZING ENGINEERED NANOPARTICLES FOR KIDNEY STONE FRAGMENTATION

→ Continued from page 61

and efficacy. We will also work on improving the efficiency of stone fragmentation through modification of the PHF nanoparticles to more strongly bind to specific types of stones.

I am excited to work with the AUA USMART program and my mentor on grant writing as well as developing preclinical trials to achieve the above objectives and

my personal goal of becoming an independently funded surgeon-scientist. I believe that Dr Inman's experience with extramural funding and translational research, specifically in nanotechnology, as well as his role on the editorial team for *European Urology*, will be highly advantageous throughout this process and for my overall career development.

We look forward to submitting the results of our studies to *The Journal of Urology*® for consideration for publication in the near future. Ultimately, our hope is that photonic lithotripsy may allow us to provide improved care and a better quality of life for our kidney stone patients as well as decrease the burden of kidney stone management on the health care sys-

tem with fewer repeat surgeries or complications. ■

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JU INSIGHT

Prospective Study Using a Novel Safety Valve to Prevent Catheter Balloon Inflation Injury of Urethra

Eabhann M. O'Connor, MD
Beaumont Hospital, Dublin, Ireland

Stefanie M. Croghan, MD
Royal College of Surgeons, Dublin, Ireland

Olivia Baird, MD
University Hospital Limerick, Ireland

John Fallon, MD
University Hospital Limerick, Ireland

Peter Loughman, MD
University Hospital Limerick, Ireland

Jibraan Esoof, MD
University Hospital Limerick, Ireland

Robert A. Keenan, MD
Beaumont Hospital, Dublin, Ireland

James Ryan, MD
Beaumont Hospital, Dublin, Ireland

Rustom Manecksha, MD
Tallaght University Hospital, Dublin, Ireland

Frank D'Arcy, MD
Galway University Hospital, Ireland

Helen Purtill, MD
University of Limerick, Ireland

Raghav Varma, MD
Hereford County Hospital, United Kingdom

Helen Thursby, MD
Hereford County Hospital, United Kingdom

Amber Matkowski, MD
Hereford County Hospital, United Kingdom

Sami El Hadi, MD
Hereford County Hospital, United Kingdom

Wasim Mahmalji, MD
Hereford County Hospital, United Kingdom

Subhasis K. Giri, MD
University Hospital Limerick, Ireland

O'Connor EM, Croghan SM, Baird O, et al. A prospective

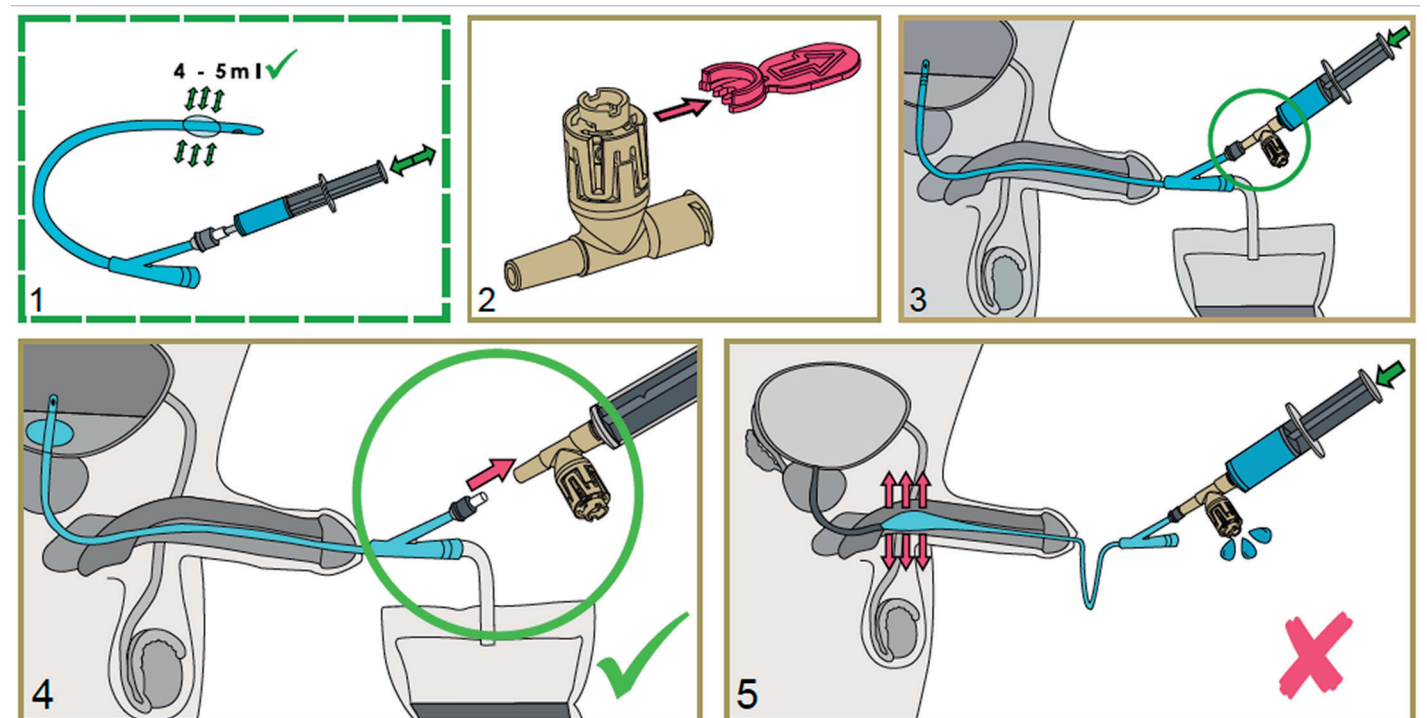


Figure 1. 1, Catheter balloon preinflation testing without using the transurethral catheterization safety valve. 2, Activation of safety valve by removing red pull-away tab. 3, Connection of balloon-inflating syringe (Luer lock or slip) with safety valve, safety valve slip with catheter balloon inflation port, then catheterization. 4, Catheter balloon inflation followed by removal of the syringe and safety valve together immediately after inflation to avoid balloon deflation by pressurized backflow. 5, Indicates transurethral catheterization safety valve venting (fluid leak) and signaling the user when the balloon has been inadvertently inflated in the urethra.

multi-institutional study using a novel safety valve for the prevention of catheter balloon inflation injury of the urethra. *J Urol*. 2023;210(1):179-185.

Study Need and Importance

Catheter balloon injury (CBI) of the urethra can result in patient morbidity and significant cost to health services. A prospective,

multi-institution study was conducted to evaluate the transurethral catheterization safety valve, which was conceived and designed with the goal of preventing CBI. The novel device is designed to prevent inadvertent inflation of the catheter's anchoring balloon in the urethra during urethral catheterization. "Venting" through the safety valve during catheterization was indicative of a prevented CBI (see Figure).

What We Found

During the overall 12-month device study phase, 994 urethral catheterizations were performed across study sites. Twenty-two (2.2%) episodes of safety valve venting were recorded. No urethral injuries occurred in these patients. In the embedded 3-month study, 18 CBIs were

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PROSPECTIVE STUDY USING A NOVEL SAFETY VALVE TO PREVENT CATHETER BALLOON INFLATION INJURY OF URETHRA

→ Continued from page 62

recorded in association with catheterizations performed without the safety valve. Based on confirmed and device-prevented urethral injuries, the injury rate for urethral catheterization without safety valve use was calculated to be 5.5/1,000 catheterizations. Health economic outcomes were also evaluated. In the base case analysis, the use of the safety valve with standard of care catheterization with a Foley

“Safety valve use reduces the rate of and has the potential to eliminate urethral CBI if widely adopted.”

catheter resulted in both quality-adjusted life year gains (0.02 qual-

ity-adjusted life years per patient) and cost savings (£93.19 per patient) over a lifetime horizon.

Limitations

As urologists, we are not called to every injury that may happen where an initially malpositioned catheter is reinserted successfully. As such, the overall total number of CBIs is likely to be underestimated.

Interpretations for Patient Care

Safety valve use reduces the rate of and has the potential to eliminate urethral CBI if widely adopted. It has the benefit of allowing use with all commercially available catheters and is significantly less expensive than specialized urinary catheters. ■

UPJ INSIGHT

New Artificial Intelligence ChatGPT Performs Poorly on the 2022 Self-assessment Study Program for Urology

Linda My Huynh, MSc

MD/PhD Scholars Program, University of Nebraska Medical Center, Omaha

Benjamin T. Bonebrake, BSBA

College of Medicine, University of Nebraska Medical Center, Omaha

Kaitlyn Schultis, BA

College of Medicine, University of Nebraska Medical Center, Omaha

Alan Quach, MD

University of Nebraska Medical Center, Omaha

Christopher M. Deibert, MD, MPH

University of Nebraska Medical Center, Omaha

Huynh LM, Bonebrake BT, Schultis K, Quach A, Deibert CM. New artificial intelligence ChatGPT performs poorly on the 2022 Self-assessment Study Program for urology. *Urol Pract.* 2023;10(4):408-416.

Study Need and Importance

Artificial intelligence holds great promise in a wide variety of industries, including clinical medicine and medical education. One application of artificial intelligence is the large language model, which has gained attention in popular media due to the release of ChatGPT by OpenAI Inc. Given its promising performance on the United States Medical Licensing Examination, we evaluated its performance on

B An obese 18-year-old woman with a small distal ureteral stone has acute renal colic only relieved by an oral opioid. An appropriate emergency room discharge prescription is:

A. extended-release hydrocodone 10 mg by mouth BID (six tablets).
 B. extended-release oxycodone 20 mg by mouth BID (12 tablets).
 C. hydrocodone-acetaminophen 5 mg/325 mg by mouth every six hours as needed (12 tablets).
 D. oxycodone-acetaminophen 5 mg/325 mg by mouth every six hours as needed (60 tablets).
 E. tramadol 50 mg by mouth every six hours as needed (12 tablets).

The appropriate emergency room discharge prescription for an obese 18-year-old woman with a small distal ureteral stone who has acute renal colic only relieved by an oral opioid would likely be option C: hydrocodone-acetaminophen 5 mg/325 mg by mouth every six hours as needed (12 tablets). This combination of medications is commonly used for moderate to severe pain and the number of tablets prescribed would typically be based on the individual's pain level and response to treatment. It is important to note that the prescription should be given under the guidance of a qualified medical professional and the patient should be counseled on the proper use, storage and disposal of the medication.

Figure. Template of multiple-choice question posed to ChatGPT. The correct answer to this question is “C. hydrocodone-acetaminophen 5 mg/325 mg by mouth every six hours as needed (12 tablets).” This multiple-choice entry was registered as correct. BID indicates twice daily.

the Self-assessment Study Program for urology, the most used exam and lifelong learning preparatory tool for urologists.

What We Found

Of the 150 questions from the 2022 Self-assessment Study Program exam, ChatGPT correctly answered less than 30% (see Figure). When provided with multiple-

choice answer options, it performed marginally better than when compared to open-ended questions (28.2% vs 26.7%). When given regenerative feedback to improve, however, ChatGPT did not answer substantially more questions correctly. Overall, responses to open-ended questions were displayed at a postgraduate reading language level and were often vague and unspecific.

Limitations

The use of artificial intelligence in medical education requires exposure to appropriate training sets and adequate reinforcement by medical professionals at the early stages. With proper training on the urological guidelines, it is possible that artificial intelligence could perform better on standardized assessments. However, the extent of such discipline-specific training for ChatGPT is unknown. As these models are still in their early stages of development, further research is required to understand their limitations and capabilities.

Interpretation for Patient Care

While this article did not assess the role of artificial intelligence in direct patient care, the present study revealed that this artificial intelligence platform does not yet have the training to serve a vital role in urological education. Prior to use in medicine, these models must be rigorously tested and validated to ensure accurate and reliable results. ■

JU INSIGHT

Renal Mass Biopsy Mandate Is Associated With Change in Treatment Decisions

Alexander Sinks, BS

Wake Forest School of Medicine, Winston-Salem, North Carolina

Caroline Miller, BS

University of North Carolina School of Medicine, Chapel Hill

Hailey Holck, BS

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina

Laurel Zeng, MS

Levine Cancer Institute, Charlotte, North Carolina

Kris Gaston, MD

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina
UT Southwestern, Dallas, Texas

Stephen Riggs, MD, MBA

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina

Justin Matulay, MD

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina

Peter E. Clark, MD

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina

Ornob Roy, MD, MBA

Levine Cancer Institute/Atrium Health, Charlotte, North Carolina

Sinks A, Miller C, Holck H, et al. Renal mass biopsy mandate is associated with change in treatment decisions. *J Urol*. 2023;210(1):72-78.

Study Need and Importance

To prevent avoidable treatment and make more informed care decisions about small renal masses, the use of renal mass biopsies (RMBs) has increased since the early 2000s. However, the true utility of RMBs has been debated due in part to poor nondiagnostic rates and negative predictive value. In April 2017, Atrium Health Carolinas Medical Center began requiring biopsies before all percutane-

“Overall, we found no significant difference between the pre- and postmandate cohorts, with race as an exception.”

ous thermal ablation procedures for renal masses. We aim to determine the effect of this preablation biopsy mandate on both malignant and benign small renal mass treatment decisions.

What We Found

Overall, we found no significant difference between the pre- and postmandate cohorts, with race as an exception. Implementation of the mandate coincided with an increase in biopsies for both ablation and nonablation treatment pathways ($P < .001$, $P = .01$). RMB rates increased in all socio-economic groups except the lowest quartile. Additionally, Black/Hispanic patients had the highest biopsy rate. We found significant changes in treatment decisions between our cohorts: surgery decreased 24% ($P < .001$), active surveillance increased 28% ($P < .001$; see Figure), and patients with no follow-up decreased 8% ($P = .03$). Our data indicate that a preablation RMB mandate is associated with the wider use of biopsies for all small renal mass patients, fewer surgical interventions, and an increase in active surveillance.

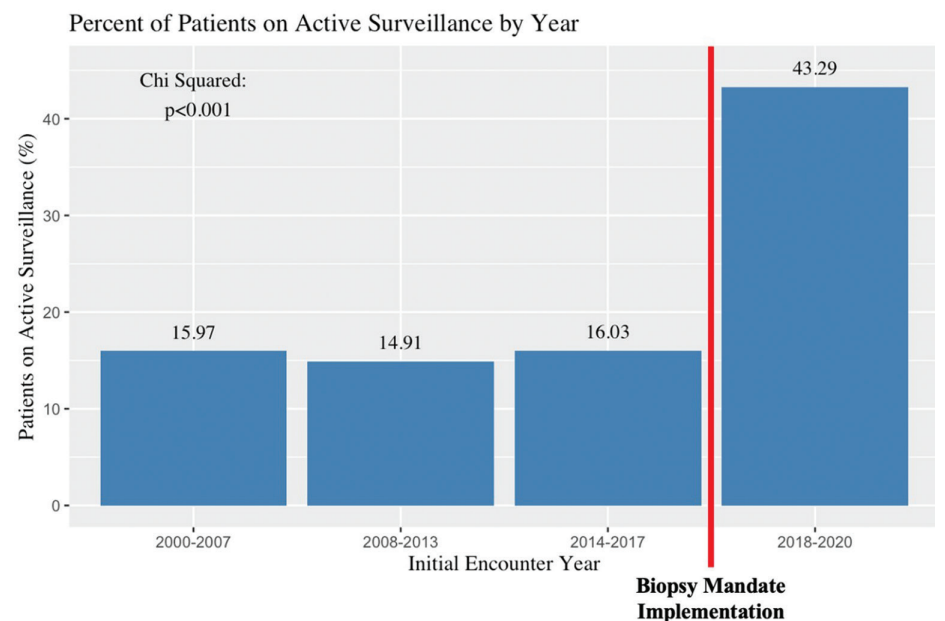


Figure. Percent of patients on active surveillance by year, with patients ranging from 2000-2020. The red vertical line denotes the time when the preablation biopsy mandate was implemented.

“In April 2017, Atrium Health Carolinas Medical Center began requiring biopsies before all percutaneous thermal ablation procedures for renal masses. We aim to determine the effect of this preablation biopsy mandate on both malignant and benign small renal mass treatment decisions.”

Limitations

Our single-institution study had unbalanced cohorts with a much larger premandate than postmandate cohort ($n=1,035$ vs $n=167$), possibly reducing power and generalizability. Furthermore, the duration of patient follow-up for our postmandate cohort is naturally shorter than for our premandate cohort, which could confound our treatment measures.

Interpretation for Patient Care

The implementation of a preablation biopsy mandate corresponded with a change in treatment decisions for patients with renal masses, increasing minimally invasive treatments and decreasing surgical treatment use. ■

JU INSIGHT

Platelet-rich Plasma for Erectile Dysfunction: A Randomized, Double-blind, Placebo-controlled Trial

Thomas A. Masterson, MD

University of Miami Miller School of Medicine, Florida

Manuel Molina, MD

University of Miami Miller School of Medicine, Florida

Braian Ledesma, MD

University of Miami Miller School of Medicine, Florida

Isaac Zucker, MD

University of Miami Miller School of Medicine, Florida

Russell Saltzman

University of Miami Miller School of Medicine, Florida

Emad Ibrahim, MD

University of Miami Miller School of Medicine, Florida

Sunwoo Han, PhD

University of Miami Miller School of Medicine, Florida

Isildinha M. Reis, PhD

University of Miami Miller School of Medicine, Florida

Ranjith Ramasamy, MD

University of Miami Miller School of Medicine, Florida

Masterson TA, Molina M, Ledesma B, et al. Platelet-rich plasma for the treatment of erectile dysfunction: a prospective, ran-

domized, double-blind, placebo-controlled clinical trial. *J Urol.* 2023;210(1):154-161.

Study Need and Importance

Erectile dysfunction (ED) is a common problem in men, and there is increasing interest in restorative therapies such as platelet-rich plasma (PRP) that may be capable of reversing underlying pathology and reestablishing natural spontaneous erections.

What We Found

In this prospective, randomized, double-blind, placebo-controlled clinical trial, we evaluated the safety and clinical efficacy of PRP for ED. Men with mild to moderate ED were sequentially randomized 1:1 to receive PRP or placebo, and regardless of randomization, all patients

underwent 2 sessions of intracavernosal injections separated by 28 ± 7

“The study found that PRP did not significantly improve erectile function compared to placebo at 1 month after the second injection. PRP injection was well tolerated with no significant adverse events.”

days. The study found that PRP did not significantly improve erectile function compared to placebo at 1 month after the second injection.

PRP injection was well tolerated with no significant adverse events.

Limitations

The limitations of this study include a small sample size and a short follow-up period.

Interpretation for Patient Care

The interpretation of the results should be made with caution, and further studies are needed to determine the long-term efficacy and safety of PRP for ED. Nonetheless, the study's objective data contribute to the ongoing research on restorative therapies for ED and can be a valuable resource for practicing urologists who are considering restorative therapies as treatment options, as well as for the many men's health clinics that advertise these therapies without any supporting data. ■

JU INSIGHT

Urethral Stricture After Artificial Urinary Sphincter Cuff Erosion Is Uncommon Without Pelvic Radiation

Kevin Krughoff, MD

Oregon Urology Institute, Springfield

Thomas Dvergsten, BA

Duke University Hospital, Durham, North Carolina

Jordan R. Foreman, MD

Duke University Hospital, Durham, North Carolina

Andrew C. Peterson, MD, MPH

Duke University Hospital, Durham, North Carolina

Krughoff K, Dvergsten T, Foreman JR, Peterson AC. Urethral stricture formation after artificial urinary sphincter cuff erosion is uncommon in the absence of pelvic radiation. *J Urol.* 2023;210(1):136-142.

Study Need and Importance

Erosion and infection comprise the most morbid artificial urinary sphincter (AUS) complications. The presentation of cuff erosion is highly variable, and the risk of subsequent stricture development is poorly understood.

What We Found

Our standard management approach for AUS erosion consists of reapproximating the fibrous pseudocapsule to facilitate more rapid healing of the damaged urethra and spon-

“The presentation of cuff erosion is highly variable, and the risk of subsequent stricture development is poorly understood.”

giosum. A urethral catheter is left in place, a peri-catheter retrograde urethrogram (RUG) is performed 3 weeks later, and a cystoscopy is performed after 3 months. We reviewed all erosion cases over a 10-year pe-

riod and categorized each case on the basis of erosion severity (see Figure). We did not find an association between stricture development and severity of erosion as we had hypothesized. Instead, post-erosion strictures occurred almost exclusively (95.5%) in the setting of prior radiation. Similarly, strictures almost never developed in the absence of radiation regardless of erosion severity. For those with a history of radiation, extravasation on post-erosion RUG was strongly associated with stricture development.

URETHRAL STRICTURE AFTER ARTIFICIAL URINARY SPHINCTER CUFF EROSION IS UNCOMMON WITHOUT PELVIC RADIATION

→ Continued from page 65

Limitations

The proportion of high-grade erosions was outnumbered considerably by the number of low-grade erosions. Comparisons to other

“We did not find an association between stricture development and severity of erosion as we had hypothesized. Instead, post-erosion strictures occurred almost exclusively (95.5%) in the setting of prior radiation.”

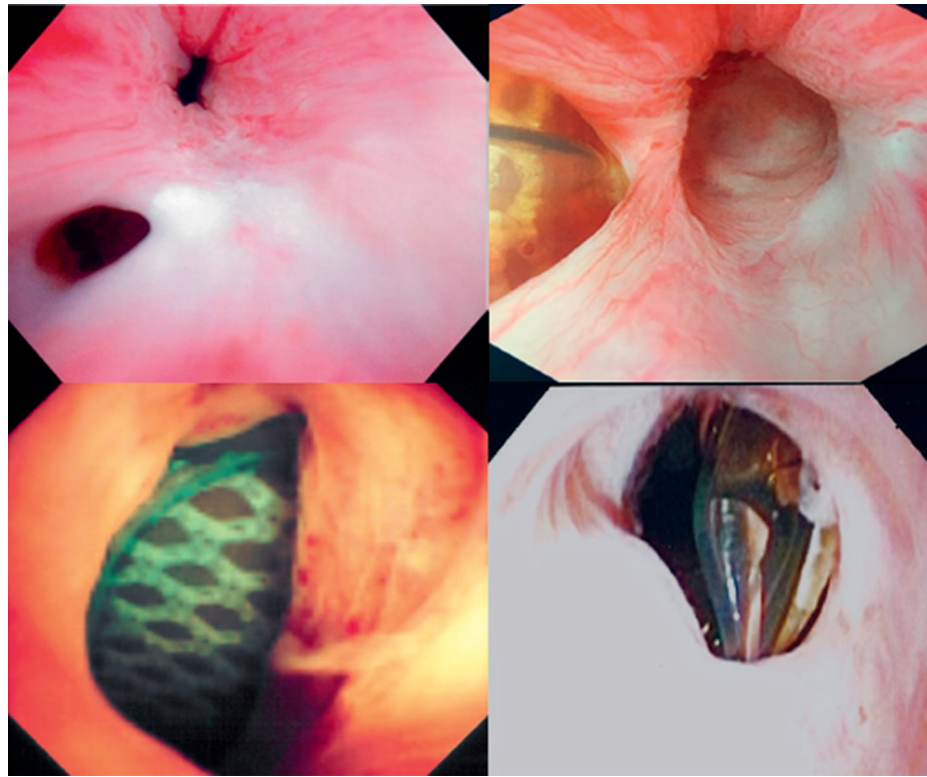


Figure. Erosion severity grades. Top left: grade 1, <25% circumferential erosion. Top right: grade 2, 25%-50% circumferential erosion. Bottom left: grade 3, 51%-99% circumferential erosion. Bottom right: grade 4, 100% erosion.

studies are limited due to variable follow-up patterns and stricture definitions. In some cases strictures take years to develop and likely not all were captured.

Interpretation for Patient Care

Erosion of the AUS cuff into the urethra does not lead to urethral stricture formation in most cases and is not associated with degree of erosion at time of presentation. Those who develop strictures nearly always have a history of pelvic radiation. Post-erosion RUG may help risk-stratify patients for follow-up purposes and treatment expectations. ■

JU INSIGHT

Does IRIS, a Segmented 3D Model, Increase Surgical Precision During Robotic Partial Nephrectomy?

Teona Iarajuli, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey
Hackensack University Medical Center,
New Jersey

Christina Caviasco, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey

Tanner Corse, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey
Hackensack University Medical Center,
New Jersey

Katherine Kim, MBS

Hackensack Meridian School of Medicine, Nutley,
New Jersey

Jennifer Nguyen, BS

Hackensack University Medical Center, New Jersey

Ruth Sanchez De La Rosa, MHA

Hackensack University Medical Center, New Jersey

Simon Gelman, PhD, MS

Hackensack University Medical Center, New Jersey

Nick Spagnuolo, BSHCM, RT(R)(CT) (ARRT)

Hackensack University Medical Center, New Jersey

Hannah Sidoti, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey

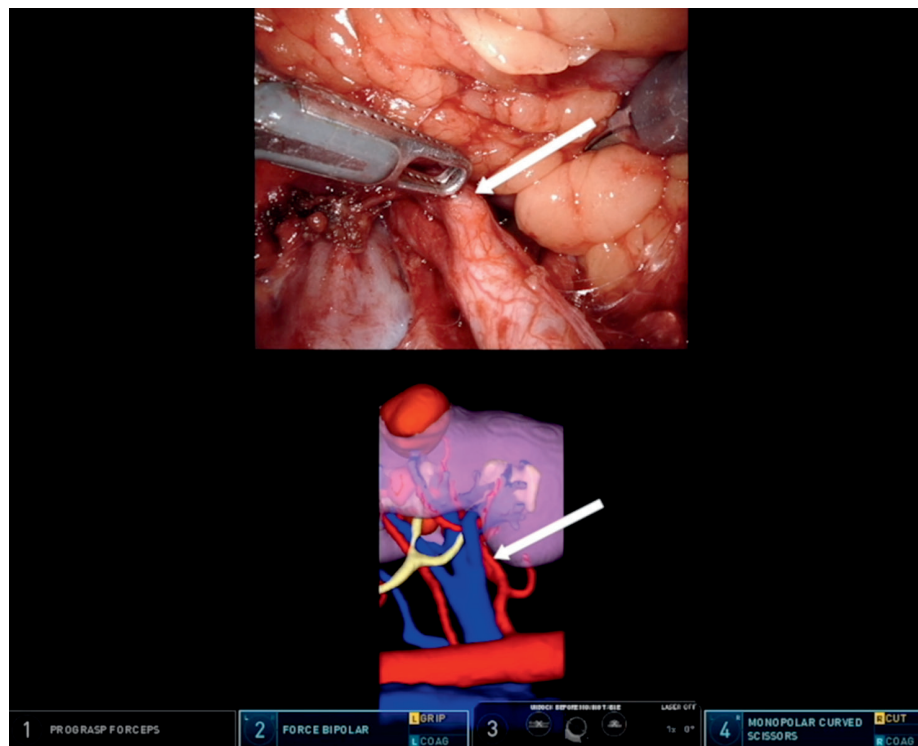


Figure. IRIS 3D model, with arrows pointing at a branch coming off of the main renal artery.

Mitchell Miller, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey
Hackensack University Medical Center, New Jersey

Michael Stifelman, MD

Hackensack Meridian School of Medicine, Nutley,
New Jersey
Hackensack University Medical Center, New Jersey

Iarajuli T, Caviasco C, Corse T, et al. Does utilizing IRIS, a segmented three-dimensional model, increase surgical precision during robotic partial nephrectomy?. *J Urol.* 2023;210(1):171-178.

Study Need and Importance

IRIS is an interactive, 3D, anatomical model displayed via TilePro within the console (see Figure). The model allows for arteries, veins, renal parenchyma, masses, and the collecting system/ureters to be color coded, facilitating interpretation of the anatomy. It also has the ability to adjust rotation and zoom to achieve intraoperative cognitive fusion. Based on the aforementioned advantages, IRIS has the potential to become a valuable tool in the surgical management of renal masses to improve surgical precision and preserve renal volume during partial nephrectomy (PN).

→ Continued on page 67

DOES IRIS, A SEGMENTED 3D MODEL, INCREASE SURGICAL PRECISION DURING ROBOTIC PARTIAL NEPHRECTOMY?

→ Continued from page 66

What We Found

We completed propensity score matched analysis between 18 IRIS and non-IRIS patients to determine whether utilizing IRIS intraoperatively improves surgical precision in PN cases. This study demonstrates that when a single experienced surgeon utilizes the 3D IRIS model during robotic PN for complex tumors, the precision is significantly improved. Regarding the efficacy of IRIS intraoperatively, we found no significant

differences in operative outcomes or margin status between the cohorts. This suggests that IRIS is safe and reproducible, and improves surgical precision, without prolonging operative time or positive margin rate.

Limitations

There are some limitations to our study. There is a potential intra-observer variability for volume analysis, which we minimized

by assigning the same operator to analyze both preoperative and postoperative scans for each patient. Additionally, in the cases of endophytic tumors, we may have overpredicted postoperative kidney volumes because adjacent parenchyma is removed. This can lead to an overestimation of the predicted postoperative volume, which may erroneously skew the results for both the IRIS and non-IRIS cohorts.

Interpretation for Patient Care

Our study demonstrated that the IRIS 3D model, when used intraoperatively, has the potential to improve patient outcomes post-robotic PN by improving surgical precision. Our results are clinically significant, as previous studies have already emphasized preserved renal parenchyma to be a determinant of postoperative renal function. ■

JU INSIGHT

First in Human Testing of UroMonitor: Catheter-free Wireless Ambulatory Bladder Pressure Monitor

Brendan T. Frainey, MD
Cleveland Clinic, Ohio

Steve J. A. Majerus, PhD
Louis Stokes VA Medical Center, Cleveland, Ohio
Cleveland Clinic, Ohio

Samir Derisavifard, MD
Cleveland Clinic, Ohio

Kevin C. Lewis, MD
Cleveland Clinic, Ohio

Anna R. Williams, RN
Cleveland Clinic, Ohio

Brian M. Balog, PhD
Cleveland Clinic, Ohio

Robert S. Butler, MS
Cleveland Clinic, Ohio

Howard B. Goldman, MD
Cleveland Clinic, Ohio

Margot S. Damaser, PhD
Cleveland Clinic, Ohio
Louis Stokes VA Medical Center, Cleveland, Ohio

Frainey BT, Majerus SJA, Derisavifard S, et al. First in human subjects testing of the UroMonitor: a catheter-free wireless ambulatory bladder pressure monitor. *J Urol.* 2023;210(1):186-195.

Study Need and Importance

Urodynamics is the standard method of diagnosing bladder dysfunction, but involves catheters and retrograde bladder filling. With these artificial conditions, urodynamics cannot always reproduce patient complaints. We have

developed a wireless, catheter-free intravesical pressure sensor, the UroMonitor, which enables catheter-free telemetric ambulatory bladder monitoring (see Figure). The purpose of this study was to evaluate accuracy of UroMonitor pressure data and assess safety and feasibility of use in humans.

What We Found

With short-term use in 11 women undergoing urodynamics for suspected overactive bladder, we found that the UroMonitor did not significantly alter capacity, sensation, or flow during urodynamics. The UroMonitor was also easily inserted and removed in all subjects. The UroMonitor successfully captured 98% (85/87) of voiding and nonvoiding urodynamic events. All subjects voided with low post-void residual volume with the UroMonitor in place. Median ambulatory pain score with the UroMonitor was rated 0 (0-2). There were no post-procedural infections or changes to voiding behavior.

Limitations

This was a feasibility study designed to assess safety and accuracy while minimizing risk to human subjects. The study was not designed or powered to

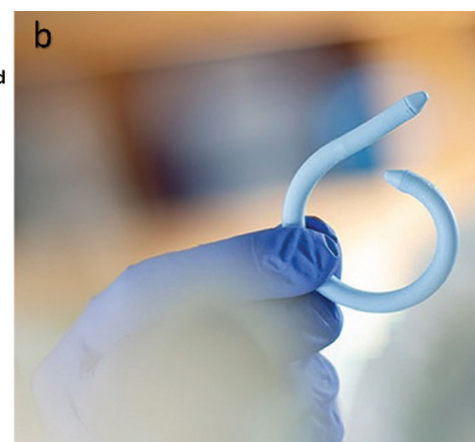
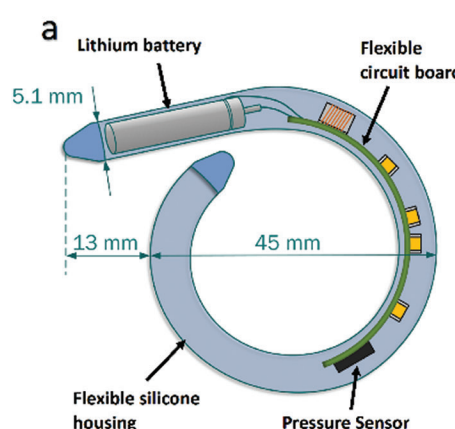


Figure. A, UroMonitor schematic with key components identified. B, Insertable UroMonitor device.

demonstrate superiority of the UroMonitor over urodynamics in terms of diagnostic capability. The UroMonitor in this current early prototype stage measures pressure only and does not include bladder volume or other diagnostic measures. Future versions will be designed to expand the scope of measured and transmitted parameters.

Interpretation for Patient Care

Current urodynamics methodologies have limitations including catheters and nonphysiological filling. This is the first report of measurement of catheter-free wireless bladder pressure data during ambulation and voiding in human subjects. Longer monitoring times

in a patient's home have the potential to revolutionize our understanding of lower urinary tract function and could provide a more

“This is the first report of measurement of catheter-free wireless bladder pressure data during ambulation and voiding in human subjects.”

accurate, less distressing method of diagnosing lower urinary tract dysfunction. ■

JU INSIGHT

Improving Upper Urinary Tract Stone Surgery Quality: Validation of Efforts to Reduce Emergency Department Visits

Andrew M. Higgins, MD, MS

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Stephanie Daignault-Newton, MS

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Russell E. N. Becker, MD, PhD

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Golena Fernandez Moncaleano, MD

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Bonnie Cheng, MPH

Michigan Value Collaborative (MVC), University of Michigan, Ann Arbor

Chelsea Abshire Pizzo, MPH

Michigan Value Collaborative (MVC), University of Michigan, Ann Arbor

Michael P. Thompson, PhD

Michigan Value Collaborative (MVC), University of Michigan, Ann Arbor

Bronson Conrado, MHSA

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Anna M. Johnson, MS

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

John M. Hollingsworth, MD, MS

NorthShore University Health System, Evanston, Illinois

Khurshid R. Ghani, MBChB, MS, FRCS

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Casey A. Dauw, MD

Michigan Urological Surgery Improvement Collaborative (MUSIC), University of Michigan, Ann Arbor

Higgins AM, Daignault-Newton S, Becker REN, et al. Improving the quality of upper urinary tract stone surgery: external validation of a statewide collaborative's efforts to reduce emergency department visits after ureteroscopy. *J Urol.* 2023;210(1):128-135.

Study Need and Importance

The Reducing Operative Complications from Kidney Stones

(ROCKS) program in the Michigan Urological Surgery Improvement Collaborative (MUSIC) was created to optimize ureteroscopy outcomes. Through data collection, distribution of reports, patient education, and standardization of medication, post-ureteroscopy emergency de-

“Through data collection, distribution of reports, patient education, and standardization of medication, post-ureteroscopy emergency department (ED) visits in Michigan have declined.”

partment (ED) visits in Michigan have declined. It is unclear if these declines were the result of MUSIC ROCKS initiatives or were due to national trends. We therefore sought to understand ED visit rates in Michigan compared to a national data set.

What We Found

From 2016 to 2021, the rate of post-ureteroscopy ED visits declined significantly in the MUSIC ROCKS registry (from 10.5% in 2016 to 6.9% in 2021) compared to a cohort in a large national data set, Clinformatics Data Mart (from 9.6% in 2016 to 10.0% in 2021). A visual representation of this decline can be seen in the Figure. The ED visit rate decline in MUSIC ROCKS outpaced national rates and provides evidence that systematic quality initiatives can improve urological care.

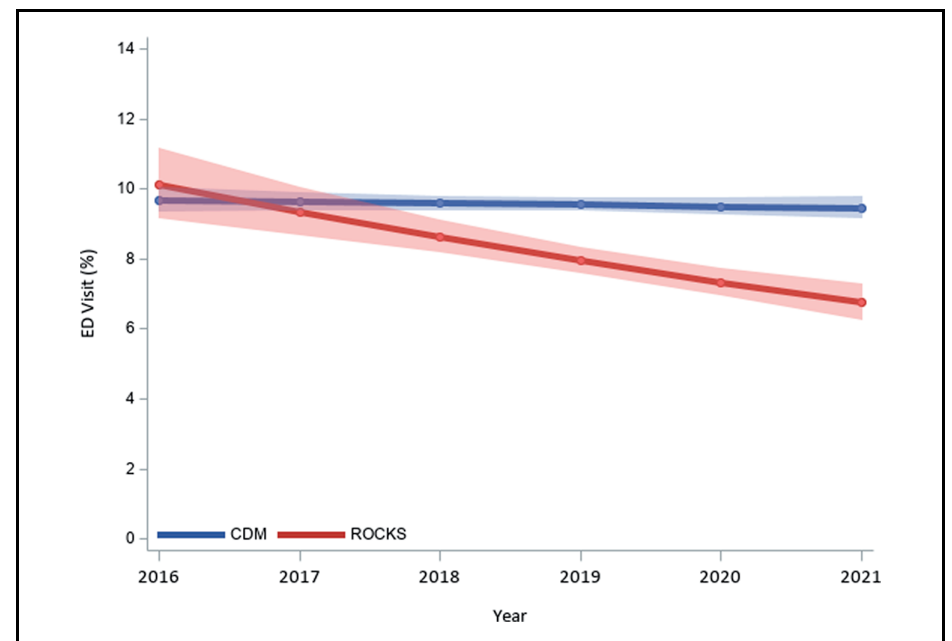


Figure. Predicted probability of post-ureteroscopy emergency department (ED) visit with 95% confidence limit bands by cohort after adjustment for age, gender, Charlson Comorbidity Index, and stent placement (difference in slopes: Wald χ^2 $P < .001$). CDM indicates Clinformatics Data Mart; MUSIC, Michigan Urological Surgery Improvement Collaborative; ROCKS, Reducing Operative Complications from Kidney Stones.

Limitations

Inherent differences in data collection and reporting techniques between a prospective registry (MUSIC ROCKS) and a retrospective claims database could have biased our results. However, by using the same methods within a Michigan-specific claims database we were able to limit the effect of these differences. There were also statistical differences in patient demographics between the cohorts, and

“The data presented within this manuscript provide the first external validation of the success of MUSIC ROCKS quality improvement efforts against an external source.”

“The ED visit rate decline in MUSIC ROCKS outpaced national rates and provides evidence that systematic quality initiatives can improve urological care.”

despite adjustment in our model, the risk of confounding still exists.

Interpretation for Patient Care

The data presented within this manuscript provide the first external validation of the success of MUSIC ROCKS quality improvement efforts against an external source. This demonstrates that large, statewide quality improvement collaboratives have the ability to effect significant change in improving postoperative outcomes after kidney stone surgery. ■

JU INSIGHT

Aquablation Lower Urinary Tract Symptoms Due to Benign Prostatic Hyperplasia: Final WATER II Results

Naeem Bhojani, MD

University of Montreal Hospital Center, Université de Montréal, Québec, Canada

Mo Bidair, MD

San Diego Clinical Trials, California

Eugene Kramolowsky, MD

Virginia Urology, Richmond

Mihir Desai, MD

University of Southern California, Los Angeles

Leo Doumanian, MD

University of Southern California, Los Angeles

Kevin C. Zorn, MD

University of Montreal Hospital Center, Université de Montréal, Québec, Canada

Dean Elterman, MD

University of Toronto University Health Network, Ontario, Canada

Ronald P. Kaufman Jr, MD

Albany Medical College, New York

Gregg Eure, MD

Urology of Virginia, Virginia Beach

Gopal Badlani, MD

Wake Forest School of Medicine, Winston-Salem, North Carolina

Mark Plante, MD

University of Vermont Medical Center, Burlington

Edward Uchio, MD

VA Long Beach Healthcare System, California

Greg Gin, MD

VA Long Beach Healthcare System, California

Ryan Paterson, MD

University of British Columbia, Vancouver, Canada

Alan So, MD

University of British Columbia, Vancouver, Canada

Claus Roehrborn, MD

UT Southwestern Medical Center, Dallas, Texas

Jay Motola, MD

Icahn School of Medicine at Mount Sinai, New York, New York

Steven Kaplan, MD

Icahn School of Medicine at Mount Sinai, New York, New York

Mitch Humphreys, MD

Mayo Clinic Arizona, Scottsdale

Study Need and Importance

Men suffering from benign prostatic hyperplasia with large prostates (>80 mL) traditionally have few treatment options. Limitations of those options can pose high post-operative morbidity risks to the patient. In comparison, Aquablation has shown consistent and durable outcomes with low associated morbidity in a randomized study compared to transurethral resection of the prostate (TURP) in prostates <80 mL. The importance of this study is to demonstrate if Aquablation can produce similar results in prostates larger than 80 mL.

What We Found

The study successfully met its safety and efficacy performance goals at 3 months, based on TURP outcomes typically done for smaller prostates. Mean prostate volume was 107 mL (range 80-150) at baseline. Patient symptoms showed a significant and sustained improvement with the mean (SD) International Prostate Symptom Score of 22.6 (6.4) at baseline decreasing to 6.8 (4.6) at 5 years, resulting in a change score of 15.9 (7.7; $P < .001$; see Figure). Uroflowmetry measurements also demonstrated significant improvement with the mean (SD) maximum urinary flow rate increasing from 8.6 (3.4) to 17.1 (9.8) mL/s at 5 years, resulting in a change score of 9.2 (11.1) mL/s ($P < .001$). A regression analysis evaluating change in PSA as a function of baseline PSA across all time points out to 5 years resulted in a 50% reduction. Freedom from a secondary benign prostatic hyperplasia procedure at 5 years was 96.3% based on the Kaplan-Meier curve.

Limitations

The study was a single-arm prospective study in large prostates with no comparison group. However, Aquablation was previously

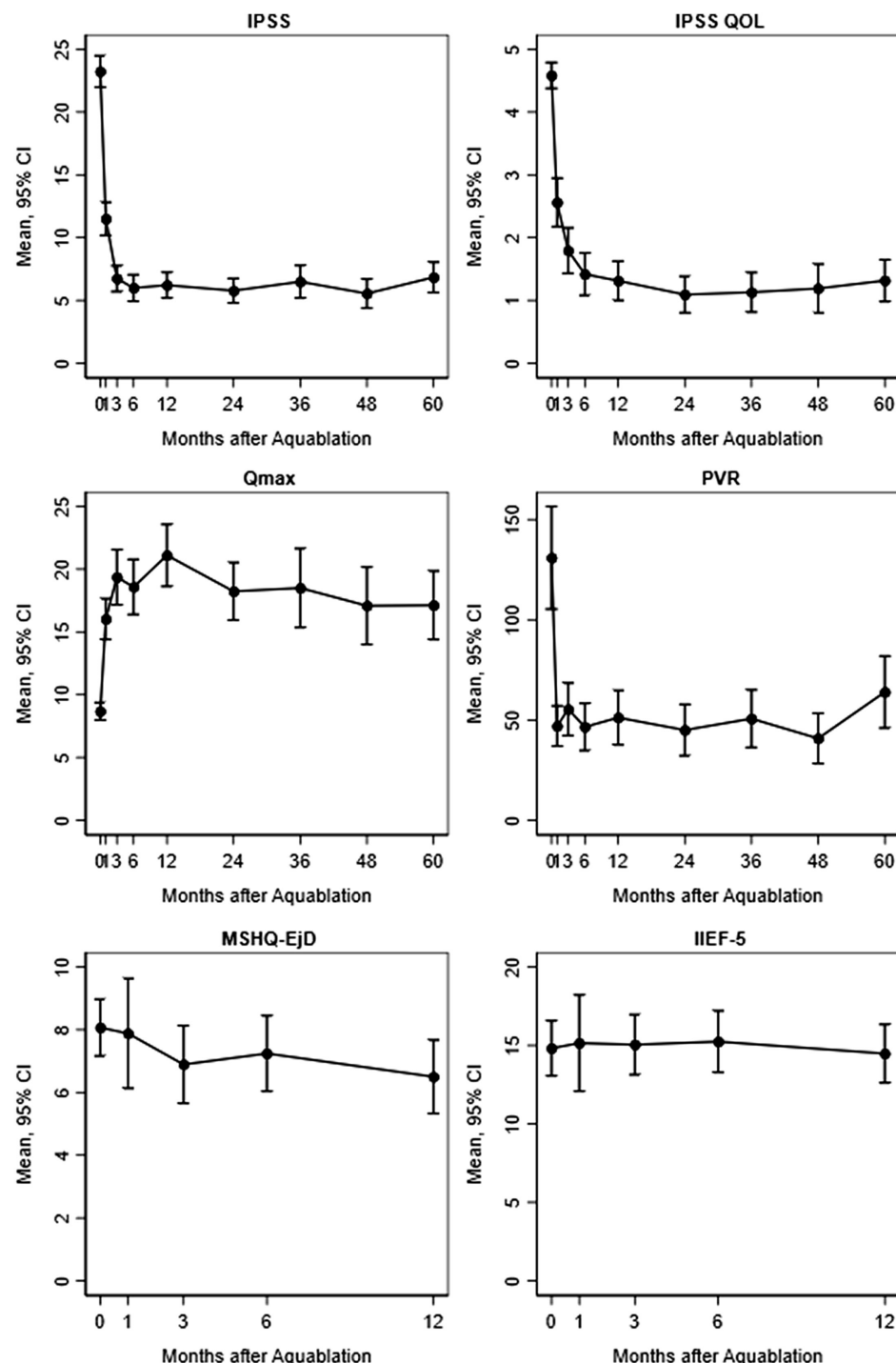


Figure. Longitudinal International Prostate Symptom Score (IPSS), IPSS quality of life (QOL), maximum urinary flow (Qmax), post-void residual (PVR), Male Sexual Health Questionnaire–Ejaculatory Dysfunction (MSHQ-EjD), and International Index of Erectile Function (IIEF-5) outcomes. CI indicates confidence interval.

studied in a randomized trial comparing TURP outcomes in smaller glands with similar results.

Interpretation for Patient Care

Aquablation has shown excellent reproducible clinical outcomes

regardless of prostate size (up to 150 mL) with a very low surgical re-treatment rate at 5 years especially for men wanting to preserve continence, erectile function, and improved ability to maintain ejaculatory function. ■

Bhojani N, Bidair M, Kramolowsky E, et al. Aquablation therapy in large prostates (80-150 mL) for lower urinary tract symptoms due to benign prostatic hyperplasia: final WATER II 5-year clinical trial results. *J Urol.* 2023;210(1):143-153.

JU INSIGHT

Outcomes Following Focal Ablative Therapy for Localized Clinically Significant Prostate Cancer in Patients >70 Years

David Habashy

University Hospital Southampton NHS Trust, United Kingdom

Deepika Reddy

*Imperial Prostate, Imperial College London, United Kingdom
Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom*

Max Peters

University Medical Centre, Utrecht, The Netherlands

Taimur T. Shah

*Imperial Prostate, Imperial College London, United Kingdom
Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom*

Marieke van Son

University Medical Centre, Utrecht, The Netherlands

Peter S. N. van Rossum

University Medical Centre, Utrecht, The Netherlands

Mariana Bertonecchi Tanaka

Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom

Emma Cullen

Imperial Prostate, Imperial College London, United Kingdom

Ryan Engle

Imperial Prostate, Imperial College London, United Kingdom

Stuart McCracken

Sunderland Royal Hospital, City Hospital Foundation Trust, United Kingdom

Damian Greene

Spire Hospital, Washington, United Kingdom

Richard G. Hindley

*Basingstoke and North Hampshire Hospital, Hampshire Hospitals NHS Foundation Trust, United Kingdom
BMI The Hampshire Clinic, Basingstoke, United Kingdom*

Amr Emara

*Basingstoke and North Hampshire Hospital, Hampshire Hospitals NHS Foundation Trust, United Kingdom
Ain Shams University Hospitals, Cairo, Egypt*

Raj Nigam

*Ain Shams University Hospitals, Cairo, Egypt
BMI Mount Alvernia Hospital, Guildford, United Kingdom*

Clement Orczyk

University College London and University College Hospital London, United Kingdom

Iqbal Shergill

Wrexham Maelor Hospital, United Kingdom

Raj Persad

North Bristol NHS Trust, Westbury on Trym, United Kingdom

Jaspal Virdi

The Princess Alexandra Hospital NHS Trust, Harlow, United Kingdom

Caroline M. Moore

*University College London and University College Hospital London, United Kingdom
Princess Grace Hospital, London, United Kingdom
King Edward VII Hospital, London, United Kingdom*

Manit Arya

*Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom
University College London and University College Hospital London, United Kingdom*

Mathias Winkler

*Imperial Prostate, Imperial College London, United Kingdom
Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom*

Mark Emberton

*University College London and University College Hospital London, United Kingdom
Princess Grace Hospital, London, United Kingdom
King Edward VII Hospital, London, United Kingdom*

Hashim U. Ahmed

*Imperial Prostate, Imperial College London, United Kingdom
Imperial Urology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, United Kingdom
King Edward VII Hospital, London, United Kingdom
Cromwell Hospital, London, United Kingdom*

Tim Dudderidge

University Hospital Southampton NHS Trust, United Kingdom

Habashy D, Reddy D, Peters M, et al. Evaluation of outcomes following focal ablative therapy for treatment of localized clinically significant prostate cancer in patients >70 years: a multi-institute, multi-energy 15-year experience. *J Urol.* 2023; 210(1):108-116.

Study Need and Importance

Knowing how best to manage the older comorbid patient with clinically significant prostate cancer can be challenging. Currently, the choice is often between radical treatment or watchful waiting. Could focal therapy represent an acceptable middle ground in those men in whom the above decision can be difficult to make?

What We Found

In a group of patients aged 70 years and over with primarily intermediate- and high-risk disease treated with focal therapy (FT), the 5-year overall survival was 96%, failure-free survival 82%, and the androgen deprivation therapy (ADT)-free survival 88%. The 5-year failure-free survival was

“The question of whether FT can prevent or delay the development of metastases or the need for ADT still needs to be tested in a direct comparison with watchful waiting.”

14% lower in the FT group when compared to a group of patients treated primarily with radiotherapy and its associated use of ADT. The burden of treatment associated with FT was lower than perhaps initially expected and felt to

“FT may represent an acceptable middle ground for the older or comorbid patient with intermediate- or high-risk disease while potentially reducing the burden associated with palliative systemic therapy.”

represent an acceptable treatment burden for the older or comorbid patient. On average, a patient can be expected to have 1 repeat MRI, and 1 in 3 patients expected to have a repeat biopsy.

Limitations

Limitations included relatively short median follow-up time of 24 months (IQR: 12, 41). The question of whether FT can prevent or delay the development of metastases or the need for ADT still needs to be tested in a direct comparison with watchful waiting.

Interpretation for Patient Care

FT may represent an acceptable middle ground for the older or comorbid patient with intermediate- or high-risk disease while potentially reducing the burden associated with palliative systemic therapy. A direct comparison between FT and watchful waiting would be invaluable. ■

JU INSIGHT

Initial Management of Indeterminate Renal Lesions in a Statewide Collaborative: A MUSIC-KIDNEY Analysis

Mohit Butaney, MD

Henry Ford Health System, Detroit, Michigan

Samantha Wilder, MD

Henry Ford Health System, Detroit, Michigan

Amit K. Patel, MD

Henry Ford Health System, Detroit, Michigan

Ji Qi, MS

University of Michigan, Ann Arbor

Mahin Mirza, MPH

University of Michigan, Ann Arbor

Sabrina L. Noyes, BS

Corewell Health Hospital System, Grand Rapids, Michigan

Anna Johnson, MS

University of Michigan, Ann Arbor

Monica Van Til, MS

University of Michigan, Ann Arbor

S. Mohammad Jafri, MD

Comprehensive Urology, Royal Oak, Michigan

Kevin B. Ginsburg, MD

Wayne State University School of Medicine, Detroit, Michigan

Craig G. Rogers, MD

Henry Ford Health System, Detroit, Michigan

Brian R. Lane, MD, PhD

Comprehensive Urology, Royal Oak, Michigan
Corewell Health Hospital System, Grand Rapids, Michigan
Michigan State University College of Human Medicine, Grand Rapids

For the Michigan Urological Surgery Improvement Collaborative

Butaney M, Wilder S, Patel AK, et al. Initial management of indeterminate renal lesions in a statewide collaborative: a MUSIC-KIDNEY analysis. *J Urol*. 2023;210(1):79-87.

Study Need and Importance

Renal masses may be characterized as “indeterminate” on imaging due to a lack of differentiating characteristics. For example, some bright lesions on contrast CT are

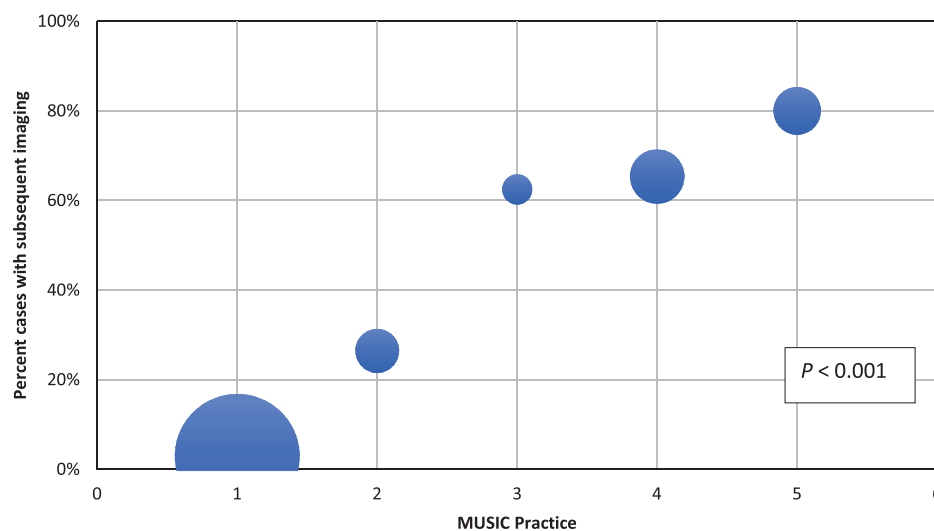


Figure. Practice variation in rates of additional imaging performed for indeterminate renal lesions. Size of bubble denotes case volume. MUSIC indicates Michigan Urological Surgery Improvement Collaborative.

hyperdense cysts, while those that enhance (compared to noncontrast CT) are suspicious for renal cancer. Other lesions are too small to accurately characterize or are incompletely visualized on the initial imaging study. Limited data exist on

“Most patients with radiographically indeterminate renal lesions should be managed with surveillance; short-interval imaging can establish suspicion for renal cancer and growth rate.”

the histological breakdown, natural history, and optimal management of indeterminate renal lesions.

What We Found

We assessed management of indeterminate renal lesions within the MUSIC-KIDNEY (Michigan Urological Surgery Improvement Collaborative–Kidney mass: Identifying and Defining Necessary Evaluation and therapy) collaborative, as well as the impact of additional imaging and biopsy on mass characterization prior to treatment. Among 2,109 patients with renal masses ≤ 7 cm in size, 21.1% were indeterminate on initial imaging. Of these 444 patients diagnosed with an indeterminate renal lesion, 33% underwent immediate treatment without additional imaging or renal mass biopsy, with nonmalignant pathology present in 10.1%. Reimaging led to reclassification of 79% of the indeterminate lesions as suspicious or benign, and renal mass biopsy provided a definitive pathological diagnosis in 87%. Significant practice-level variation in the performance of additional imaging was seen (see Figure), in-

dicating an opportunity for quality improvement.

Limitations

The lack of histological data on observed indeterminate renal lesions limits our ability to comment on their oncologic potential. Additionally, heterogeneity in interpretation of imaging studies may exist due to the lack of a centralized radiology service.

Interpretation for Patient Care

Most patients with radiographically indeterminate renal lesions should be managed with surveillance; short-interval imaging can

“Prior to intervention, patients with indeterminate renal lesions should undergo additional imaging or renal mass biopsy to establish suspicion for renal cancer.”

establish suspicion for renal cancer and growth rate. Prior to intervention, patients with indeterminate renal lesions should undergo additional imaging or renal mass biopsy to establish suspicion for renal cancer. This management schema will reduce the overtreatment of patients with benign renal neoplasms which do not require intervention. ■

JU INSIGHT

Active Surveillance After Biopsy Reclassification to Grade Group 2 Prostate Cancer

Ezra Baraban, MD

Johns Hopkins Hospital, Baltimore, Maryland

Eric Erak, MD

Johns Hopkins Hospital, Baltimore, Maryland

Aisha Fatima, MD

Johns Hopkins Hospital, Baltimore, Maryland

Amir Akbari, MD

Johns Hopkins Hospital, Baltimore, Maryland

Jianping Zhao, MD, PhD

Johns Hopkins Hospital, Baltimore, Maryland

Sean A. Fletcher, MD

Johns Hopkins Hospital, Baltimore, Maryland

Yasin Bhanji, MD

Johns Hopkins Hospital, Baltimore, Maryland

Claire M. de la Calle, MD

Johns Hopkins Hospital, Baltimore, Maryland

Mufaddal Mamawala, MBBS, MPH

Johns Hopkins Hospital, Baltimore, Maryland

Patricia Landis

Johns Hopkins Hospital, Baltimore, Maryland

Katarzyna J. Macura, MD, PhD

Johns Hopkins Hospital, Baltimore, Maryland

Christian P. Pavlovich, MD

Johns Hopkins Hospital, Baltimore, Maryland

Jonathan I. Epstein, MD

Johns Hopkins Hospital, Baltimore, Maryland

Baraban E, Erak E, Fatima A, et al. Identifying men who can remain on active surveillance despite biopsy reclassification to grade group 2 prostate cancer. *J Urol.* 2023;210(1):99-107.

Study Need and Importance

Men on active surveillance (AS) with grade group (GG) 1 prostate cancer who reclassify to GG2 on surveillance biopsy often leave AS. However, there are limited data available to guide this difficult decision. We aimed to identify subgroups of men who can safely remain on AS despite reclassification to GG2.

What We Found

Fifty-seven percent of men who were reclassified to GG2 on bi-

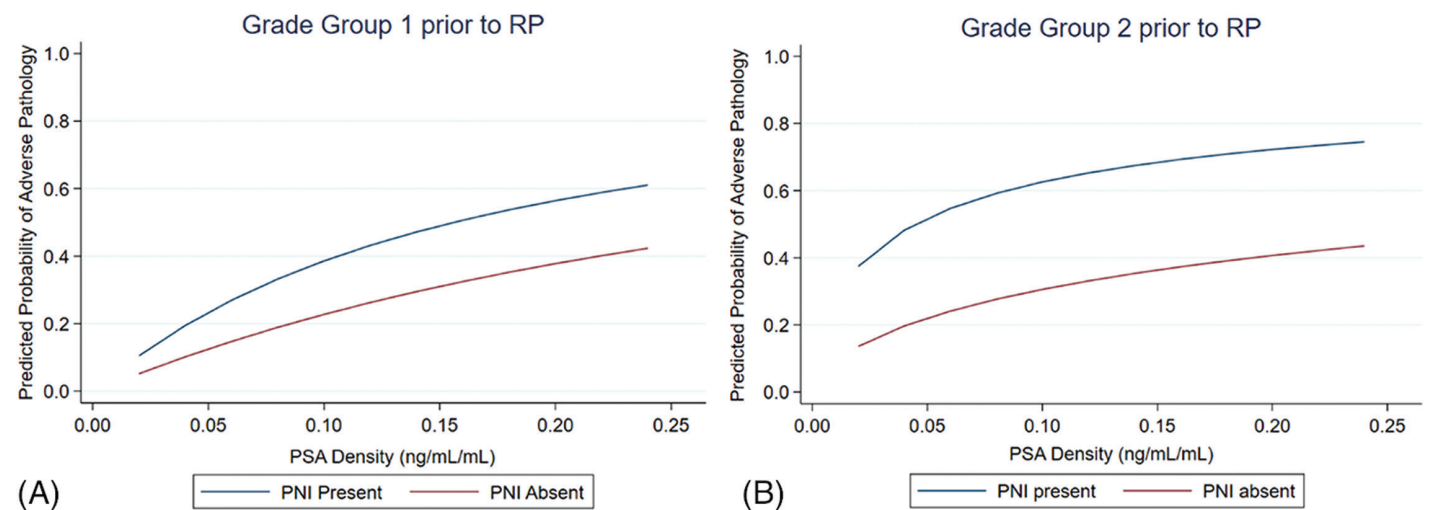


Figure. Predicted risk of adverse pathology at radical prostatectomy (RP) in grade group 1 patients (A) and in patients reclassified to grade group 2 (B) stratified by perineural invasion (PNI) using multivariable regression model incorporating PNI and prostate-specific antigen (PSA) density.

opsy after entering AS with GG1 disease showed favorable pathological findings at prostatectomy. Perineural invasion and PSA density were significant risk factors for adverse pathology at radical prostatectomy among GG1 AS patients as well as in patients reclassified to GG2 while on AS. Multivariable regression based on PSA density and perineural invasion demonstrated that GG2 patients with low PSA density and without perineural invasion have lower risk for adverse pathology at prostatectomy than GG1 patients with these risk factors (see Figure). Therefore, reclassification to GG2 alone should not disqualify men from continuing on AS, particularly in the absence of other worrisome clinical, radiographic, or pathological findings such as percent Gleason pattern 4 approaching 50%, large cribriform morphology, or intraductal carcinoma.

Limitations

Findings are limited by the retrospective and single-institution design of the study. While MRI Prostate Imaging Reporting & Data System score was not a significant

“Men on active surveillance (AS) with grade group (GG) 1 prostate cancer who reclassify to GG2 on surveillance biopsy often leave AS. However, there are limited data available to guide this difficult decision.”

risk factor for adverse pathology in our cohort, evaluation is limited as the majority of the cohort preceded routine clinical MRI use.

Interpretation for Patient Care

Patients reclassified to GG2 while on AS should not reflexively leave AS and undergo definitive treatment. In the absence of other worrisome findings, patients with low PSA density and without peri-

“Patients reclassified to GG2 while on AS should not reflexively leave AS and undergo definitive treatment. In the absence of other worrisome findings, patients with low PSA density and without perineural invasion are particularly suitable candidates for remaining on AS despite reclassification to GG2.”

neural invasion are particularly suitable candidates for remaining on AS despite reclassification to GG2. ■

JU INSIGHT

Unilateral Pelvic Lymph Node Dissection in Prostate Cancer Diagnosed in Era of MRI-targeted Biopsy

Alberto Martini, MD

La Croix du Sud Hospital, Toulouse, France

Lieke Wever, MD

*St Antonius Ziekenhuis, Nieuwegein, The Netherlands
Canisius Wilhelmina Hospital, Nijmegen, The Netherlands*

Timo F. W. Soeterik, MD

St Antonius Ziekenhuis, Nieuwegein, The Netherlands

Arnas Rakauskas, MD

Lausanne University Hospital and University of Lausanne, Switzerland

Christian Daniel Fankhauser, MD

University Hospital Zurich, University of Zurich, Switzerland

Josias Bastian Grogg

University Hospital Zurich, University of Zurich, Switzerland

Enrico Checcucci, MD, MSc

San Luigi Hospital, Turin, Italy

Daniele Amparore, MD

San Luigi Hospital, Turin, Italy

Luciano Haiquel, MD

Institut Mutualiste Montsouris, Paris, France

Lara Rodriguez-Sanchez, MD

Institut Mutualiste Montsouris, Paris, France

Guillaume Ploussard, MD, PhD

La Croix du Sud Hospital, Toulouse, France

Peng Qiang

Kantonsspital Winterthur, Switzerland

Andres Affentranger

Kantonsspital Winterthur, Switzerland

Alessandro Marquis, MD

San Giovanni Battista Hospital, University of Turin, Italy

Giancarlo Marra, MD

San Giovanni Battista Hospital, University of Turin, Italy

Otto Ettala, PhD

Turku University, Finland

Fabio Zattoni, MD, PhD

*Academical Medical Centre Hospital, Udine, Italy
University of Padua, Italy*

Ugo Giovanni Falagarlo, MD

University of Foggia, Italy

Mario De Angelis

IRCCS San Raffaele Hospital, Milan, Italy

Claudia Kesch, MD

*University Hospital Essen, Germany
German Cancer Consortium (DKTK)-University Hospital Essen, Germany*

Maria Apfelbeck, MD

LMU, Munich, Germany

Tarek Al-Hammouri

University College London and University College London Hospitals NHS Foundation Trust, United Kingdom

Alexander Kretschmer, MD

LMU, Munich, Germany

Veeru Kasivisvanathan, PhD

University College London and University College London Hospitals NHS Foundation Trust, United Kingdom

Felix Preisser, MD

University Hospital Frankfurt, Germany

Emilie Lefebvre

CHU Lille, France

Jonathan Olivier, MD

CHU Lille, France

Jan Philipp Radtke, MD

*University Hospital Essen, Germany
German Cancer Consortium (DKTK)-University Hospital Essen, Germany*

Alberto Briganti, MD, PhD

IRCCS San Raffaele Hospital, Milan, Italy

Francesco Montorsi, MD, PhD

IRCCS San Raffaele Hospital, Milan, Italy

Giuseppe Carrieri, MD

University of Foggia, Italy

Fabrizio Dal Moro, MD

*Academical Medical Centre Hospital, Udine, Italy
University of Padua, Italy*

Peter Boström, MD

Turku University, Finland

Ivan Jambor, MD

Turku University, Finland

Paolo Gontero, MD

San Giovanni Battista Hospital, University of Turin, Italy

Peter K. Chiu, PhD

The Chinese University of Hong Kong, China

Hubert John, MD

Kantonsspital Winterthur, Switzerland

Petr Macek, MD

Institut Mutualiste Montsouris, Paris, France

Francesco Porpiglia, MD

San Luigi Hospital, Turin, Italy

Thomas Hermanns, MD

University Hospital Zurich, University of Zurich, Switzerland

Roderick C.N. van den Bergh, MD

St Antonius Ziekenhuis, Nieuwegein, The Netherlands

Jean-Paul A. van Basten, MD

*St Antonius Ziekenhuis, Nieuwegein, The Netherlands
Canisius Wilhelmina Hospital, Nijmegen, The Netherlands*

Dominant ISUP	Contralateral ISUP	Contralateral LNI
1-2	Neg biopsy or 1	1/414
2	2	3/147
3	Neg biopsy or 1	2/230
3	2	3/93
3	3	4/80

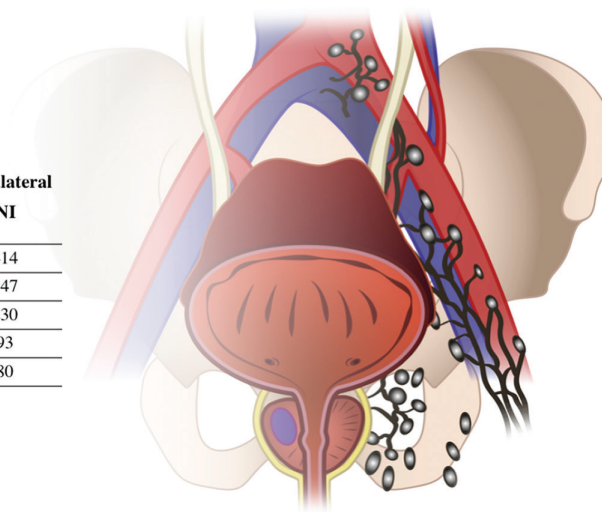


Figure. Distribution of contralateral lymph node metastases according to International Society of Urological Pathology (ISUP) grade on the dominant and contralateral sides in the absence of high-risk clinical features (prostate-specific antigen ≥ 20 ng/mL and/or extraprostatic extension or seminal vesicle invasion on multiparametric magnetic resonance imaging and/or grade group ≥ 4). LNI indicates lymph node invasion; neg, negative.

Giorgio Gandaglia, MD, PhD

IRCCS San Raffaele Hospital, Milan, Italy

Massimo Valerio, MD, PhD

Geneva University Hospital, University of Geneva, Switzerland

On behalf of the Young Academic Urologists Working Group on Prostate Cancer of the European Association of Urology

Martini A, Wever L, Soeterik TFW, et al. Unilateral pelvic lymph node dissection in prostate cancer patients diagnosed in the era of magnetic resonance imaging-targeted biopsy: a study that challenges the dogma. *J Urol.* 2023;210(1):117-127.

Study Need and Importance

The currently available clinical models for lymph node invasion (LNI) prediction are hampered by a relatively low specificity, the removed lymph nodes being negative up to 70% of the time. Up to 2016, prostate cancer (PCa) clinical staging was based mostly on digital rectal examination and prostatic biopsy according to prespecified templates, also referred to as “random” biopsy. Since then, the diagnostic pathway for prostate cancer has changed and currently consists

in MRI first with subsequent targeted biopsy of the suspicious areas of the prostate along with random sampling of the gland. This represents a major step forward in managing PCa; the use of preoperative MRI provides surgeons with seminal staging information. To our knowledge, this is the first study to assess the feasibility of unilateral extended pelvic lymph node dissection (ePLND) in the era of modern PCa imaging.

What We Found

LNI contralateral to the prostatic lobe with worse tumor characteristics is rare and depends on the presence of cancer contralateral to the dominant side, its grade, and extent. Our findings provide the grounds for evaluating unilateral ePLND in future studies.

Limitations

The multi-institutional nature of our data might harbor a certain degree of unaccounted heterogeneity, especially concerning MRI acquisition, reporting, and biopsy together with the lack of external validation.

UNILATERAL PELVIC LYMPH NODE DISSECTION IN PROSTATE CANCER DIAGNOSED IN ERA OF MRI-TARGETED BIOPSY

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Interpretation for Patient Care

In the era of modern PCa imaging, ePLND can be omitted

contralateral to the prostatic lobe with the worse tumor burden in selected patients, especially in the absence of high-risk clinical features. We propose a model for

the prediction of LNI contralateral to the dominant prostate lobe that can help avoid contralateral ePLND in almost one-third of cases. Potential benefits of our

model in clinical practice could be shorter operative time and lower risk of complications and costs (see Figure). ■

UPJ INSIGHT

Predictors of Timely and Delayed Evaluation After Referral for Elevated PSA in a High-risk Population

Rutul D. Patel, DO

Montefiore Medical Center, Bronx, New York

Michael Zhu, MS

Albert Einstein College of Medicine, Bronx, New York

Priya Dave, MD

Montefiore Medical Center, Bronx, New York

Iliir Agalliu, MD

Montefiore Medical Center, Bronx, New York

Quoc-Dien Trinh, MD

Brigham and Women's Hospital, Boston, Massachusetts

Kara L. Watts, MD

Montefiore Medical Center, Bronx, New York
Albert Einstein College of Medicine, Bronx, New York

Patel RD, Zhu M, Dave P, Agalliu I, Trinh Q-D, Watts KL. Predictors of timely and delayed urological evaluation following referral for elevated prostate-specific antigen

in a diverse, urban, high-risk population. *Urol Pract.* 2023;10(4):353-359.

Study Need and Importance

An elevated prostate-specific antigen (PSA) often prompts a referral to urologists for further evaluation. Delayed, or even absent, urological evaluation can potentially lead to a delay in diagnosis of prostate cancer. Identifying patient-specific characteristics that are associated with timely urological evaluation in men with elevated PSA may inform practice changes that can help to ensure appropriate follow-up for men identified with an elevated PSA.

What We Found

We retrospectively reviewed data from 1,335 men who were referred to urology for initial elevated PSA and categorized their time to initial urological evaluation as either timely (within 4 months of referral), late (after 4 months), or absent (no urology evaluation). Multivariable logistic regression showed that being non-Hispanic Black, Hispanic, Spanish-speaking, or a former smoker increased odds of timely urological evaluation.

Limitations

Our limitations include the retrospective nature of our study resulting in an inability to assess certain

variables, such as reason for absent urological evaluation or whether men sought evaluation outside of our health care system. Furthermore, we were unable to confirm whether urological care was provided outside of our health care network.

Interpretation for Patient Care

In our urban, highly diverse cohort, non-Hispanic White men and English-speaking men demonstrate a vulnerability to delayed urological evaluation following elevated PSA referral. Recognizing patient-specific factors that limit timely follow-up can help referring physicians be more proactive in their goal to provide timely and equitable care. ■

UPJ INSIGHT

Use of a Virtual Tumor Board for Renal Masses in the Michigan Urological Surgery Improvement Collaborative

Mahmoud A. Hijazi

Oakland University William Beaumont School of Medicine, Rochester Hills, Michigan

Zachary J. Prebay

Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania

Anna Johnson

University of Michigan, Ann Arbor

Samantha Wilder, MD

Henry Ford Health System, Detroit, Michigan

Amit K. Patel, MD

Henry Ford Health System, Detroit, Michigan

Rohit Mehra

University of Michigan, Ann Arbor

James E. Montie

University of Michigan, Ann Arbor

Sabrina L. Noyes, BS

Spectrum Health, Grand Rapids, Michigan

Mahin Mirza, MPH

University of Michigan, Ann Arbor

S. Mohammad Jafri, MD

Comprehensive Urology, Royal Oak, Michigan

Alon Weizer

University of Michigan, Ann Arbor

Richard Sarle

Sparrow Medical Group, Lansing, Michigan

Khurshid R. Ghani

University of Michigan, Ann Arbor

Craig G. Rogers, MD

Henry Ford Health System, Detroit, Michigan

Brian R. Lane, MD, PhD, FACS

Spectrum Health, Grand Rapids, Michigan
Michigan State University College of Human Medicine, Grand Rapids

For the Michigan Urological Surgery Improvement Collaborative

Hijazi MA, Prebay ZJ, Johnson A, et al. Utilization of a virtual tumor board for the care of patients with renal masses: experience from a quality improvement collaborative. *Urol Pract.* 2023;10(4):380-388.

Study Need and Importance

Multidisciplinary tumor boards are offered at some institutions, and the literature confirms they can improve patient outcomes. There is limited published evidence regarding such tumor boards in the field of urology, with only 1 other publication regarding a virtual tumor board (VTB). We report our experience in developing

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USE OF A VIRTUAL TUMOR BOARD FOR RENAL MASSES IN THE MICHIGAN UROLOGICAL SURGERY IMPROVEMENT COLLABORATIVE

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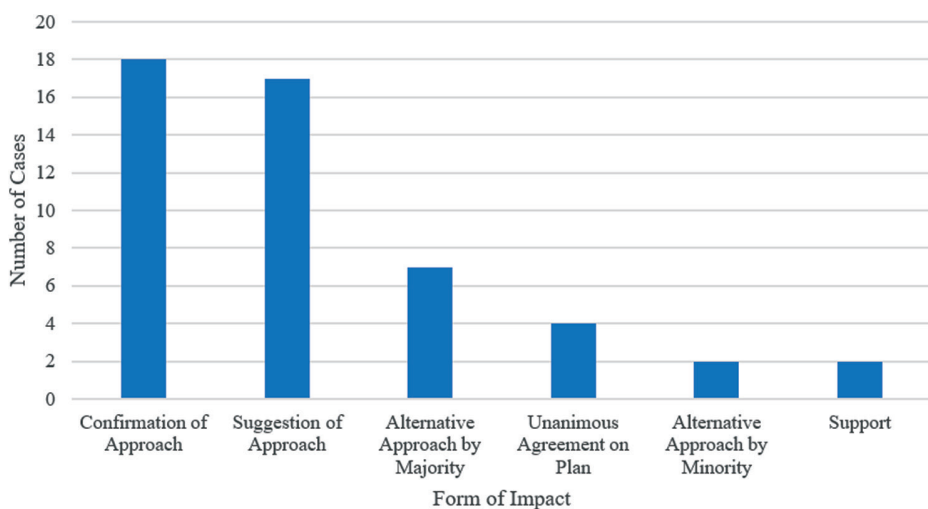


Figure. Impact of virtual tumor board responses on treatment plan.

a functioning and valuable VTB for urologists who participate in the Michigan Urological Surgical Improvement Collaborative (MUSIC).

What We Found

Over the course of 2 years, MUSIC urologists have submitted 50 renal mass cases to the VTB for dis-

cussion by their colleagues. These submissions generated over 350 messages from more than 58 specialists in urology, medical oncology, and genitourinary pathology. These responses provided an initial treatment plan for 42% of cases, an alternative approach to the submitting physician's initial plan in 16%, and confirmed the clinician's approach in 38% of cases (see Figure). Impressively, the VTB appears to have increased the use of surveillance (which was implemented in 11 patients initially to undergo surgery). Kidney-sparing interventions were used when appropriate, as evidenced by the fact that each radical nephrectomy performed was warranted according to the participants in the VTB.

Limitations

Our study is limited by its sample size and reach, and the ability to determine whether the VTB recommendations truly resulted in better patient outcomes, as the length and availability of follow-up data were somewhat limited.

Interpretation for Patient Care

Overall, it is evident that virtual discussion forums, such as the MUSIC VTB, provide value in the field of urology, and we hope others develop and utilize similar platforms to generate more discussion of complex patient scenarios to achieve the best outcome for each patient. ■

UPJ INSIGHT

Cost of Bladder Cancer Care: A Single-center Comparison of Radical Cystectomy and Trimodal Therapy

Diana E. Magee, MD, MPH, MSc
Fox Chase Cancer Center, Temple University Health System, Philadelphia, Pennsylvania
University of Toronto, Ontario, Canada

Douglas C. Cheung, MD, MBA, PhD
University of Toronto, Ontario, Canada

Amanda E. Hird, MD, MSc
University of Toronto, Ontario, Canada

Peter Chung, MBBCh, FRCP, MRCP(UK), FRCPC
University of Toronto, Ontario, Canada

Padraig Warde, MCChB, BAO
University of Toronto, Ontario, Canada

Charles Catton, MD
University of Toronto, Ontario, Canada

Alejandro Berlin, MD, MSc
University of Toronto, Ontario, Canada

Alexandre Zlotta, MD, PhD
University of Toronto, Ontario, Canada

Neil E. Fleshner, MD, MPH
University of Toronto, Ontario, Canada

Girish S. Kulkarni, MD, PhD
University of Toronto, Ontario, Canada

Magee DE, Cheung DC, Hird AE, et al. Cost of bladder cancer care: a single-center comparison of radical cystectomy and trimodal therapy. *Urol Pract.* 2023;10(4):292-299.

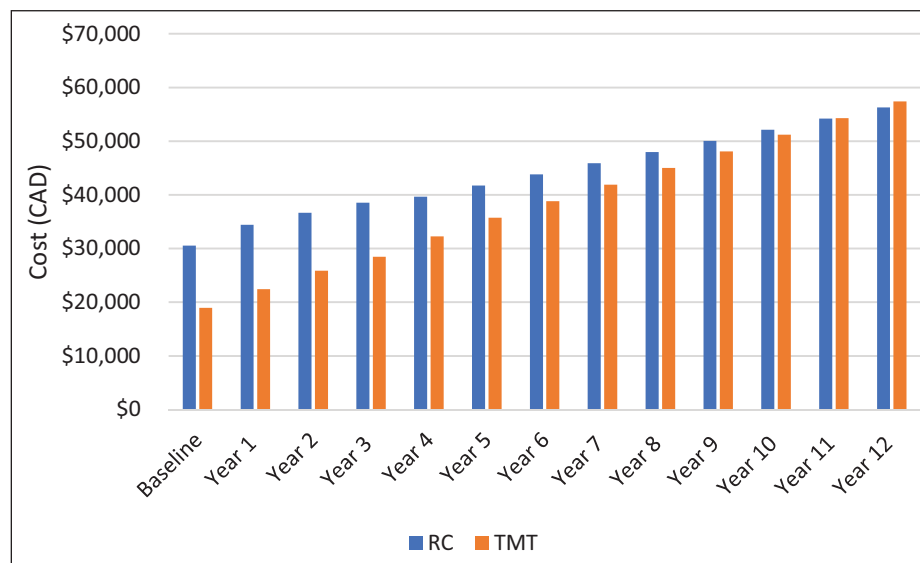


Figure. Lifetime accumulated cost per strategy. CAD indicates Canadian dollars; RC, radical cystectomy; TMT, trimodal therapy.

Study Need and Importance

Our study evaluates the cost of providing care for muscle-invasive bladder cancer within the Canadian landscape. We compared the cost of care from diagnosis to recurrence for patients treated with either trimodal therapy (TMT) or radical cystectomy (RC). Our aim was to assess for any

differences between the treatment modalities and the phases of care. This paper addresses a question that has yet to be addressed within a Canadian jurisdiction and highlights for health care decision makers the variability and timing of cost burdens.

What We Found

We found that RC has a higher burden of costs up front in the

treatment phase which are related to the surgery and its complications, while TMT has a higher cost for ongoing follow-up (see Figure).

Limitations

Limitations of the paper include the single-center institution data collection, potential imperfect capture of patient events and loss to follow-up. As well, we did not account for indirect costs of therapy including loss of productivity or caregiver burden.

Interpretation for Patient Care

The most significant takeaway from this study for patient care is the recognition that within a single-payer health care system neither treatment modality is cost prohibitive. The 2 treatments evaluated simply have distinct cost burdens at different times in the clinical timeline. ■

UPJ INSIGHT

Prolonged Opioid Use Following Bladder Tumor Resection for Opioid-naïve Patients

Benjamin Croll, MD

Emory University School of Medicine,
Atlanta, Georgia

Dattatraya Patil, MBBS

Emory University School of Medicine,
Atlanta, Georgia

Misaki Mason, BA

Emory University School of Medicine,
Atlanta, Georgia

Vikram M. Narayan, MD

Emory University School of Medicine,
Atlanta, Georgia

Viraj Master, MD

Emory University School of Medicine,
Atlanta, Georgia

Christopher P. Filson, MD, MS

Emory University School of Medicine,
Atlanta, Georgia

Shreyas S. Joshi, MD

Emory University School of Medicine,
Atlanta, Georgia

Croll B, Patil D, Mason M, et al. Prolonged opioid use following bladder tumor resection for opioid-naïve patients. *Urol Pract.* 2023;10(4):344-351.

Study Need and Importance

Rates of opioid abuse and overdose increased dramatically in recent years, with prescription opioids involved in nearly one-quarter of overdose deaths. In surgical patients, preoperative opioid use has been associated with prolonged hospitalization, higher complication rates, and higher opioid requirements after major surgery. Bladder cancer patients represent a high-risk group for persistent opioid use after initial exposure due to frequency of procedures and interface with health care providers.

What We Found

Insurance claims data of more than 80,000 patients were used to

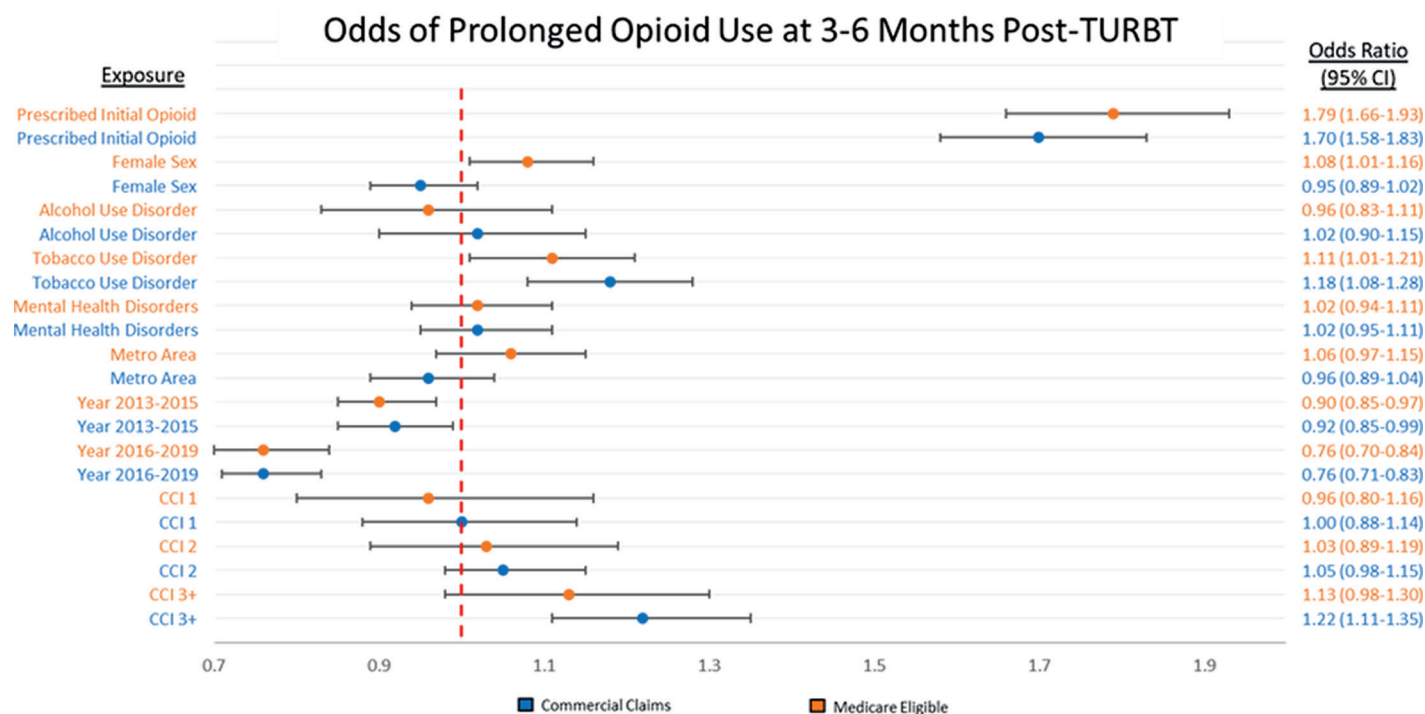


Figure. Odds of prolonged use of opioids in MarketScan commercial claims and Medicare-eligible groups, derived from multivariable regression analysis. Charlson Comorbidity Index (CCI) reference group is CCI 0. Year reference group is 2009–2012. CI indicates confidence interval; TURBT, transurethral resection of bladder tumor.

identify opioid-naïve patients with newly diagnosed bladder cancer. Those receiving post-transurethral resection of bladder tumor (TURBT) opioids had significantly increased odds of prolonged opioid use (see Figure), and those receiving the highest initial doses had the greatest odds of continuing to fill prescriptions in the months following initial TURBT. Odds of prolonged use have decreased in recent years, but the frequency of initial opioid prescribing is relatively unchanged. The mean oral morphine equivalent value when opioids are prescribed initially is 150.0, the equivalent of 20 pills of 5 mg oxycodone.

Limitations

Persistent use at 3–6 months does not imply substance abuse or dependence, but we know from pri-

or studies that increased exposure is almost universally associated

“Insurance claims data of opioid-naïve bladder cancer patients have shown that an initial post-TURBT opioid prescription is strongly associated with continued opioid use in the months that follow diagnosis.”

with poor health outcomes. While we did control for events under

anesthesia and radical treatment within our multivariable analysis, a more in-depth understanding of the effect of TURBT and cystectomy on prolonged opioid use would add value to future study of this topic.

Interpretation for Patient Care

Insurance claims data of opioid-naïve bladder cancer patients have shown that an initial post-TURBT opioid prescription is strongly associated with continued opioid use in the months that follow diagnosis. The long-term implications of these prescriptions deserve thought and consideration, and additional research on methods to limit opioid use in bladder cancer patients is merited. ■

UPJ INSIGHT

Adverse Events of Abiraterone Acetate vs Enzalutamide

Leandro Blas, MD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Masaki Shiota, MD, PhD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Shigehiro Tsukahara, MD, PhD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Shohei Nagakawa, MD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Takashi Matsumoto, MD, PhD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Masatoshi Eto, MD, PhD

Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan

Blas L, Shiota M, Tsukahara S, Nagakawa S, Matsumoto T, Eto M. Adverse events of abiraterone acetate vs enzalutamide. *Urol Pract.* 2023;10(4):360-370.

Study Need and Importance

Monitoring adverse events is a key aspect of pharmacovigilance. Profiling and comparing adverse events caused by abiraterone and enzalutamide can improve the safety profile and help identify the best candidate for each therapy.

What We Found

Both drugs presented different toxicity profiles in most System Organ Classes. Overall, abiraterone presented a higher rate of serious adverse events than enzalutamide. The Figure shows the disproportionate distribution of adverse events between abiraterone and enzalutamide. Moreover, patients ≥ 70 years using enzalutamide presented a higher rate of toxicity in ear and labyrinth disorders, endocrine disorders, and metabolism and nutrition disorders. On the contrary, patients ≥ 70 years receiving abiraterone presented a

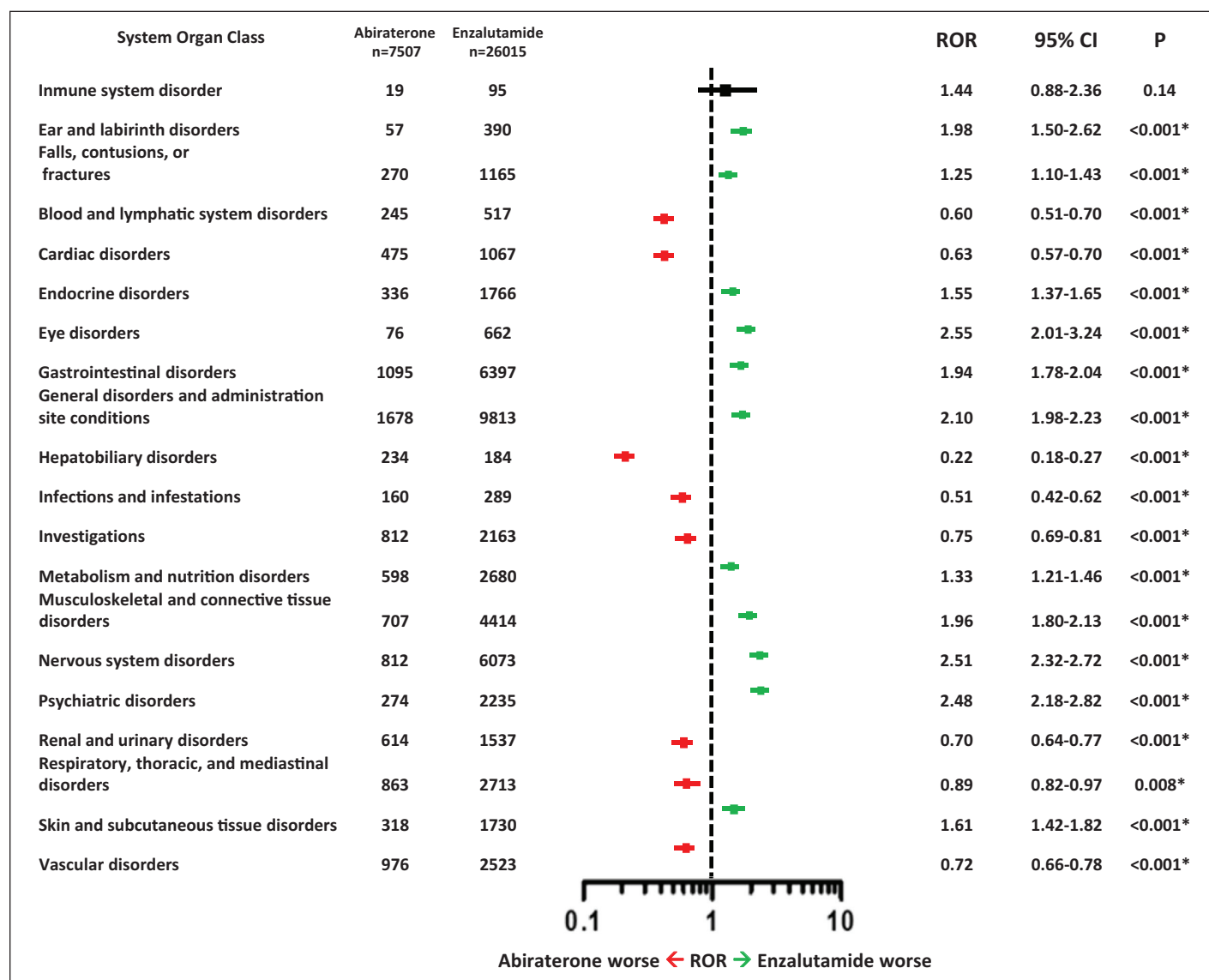


Figure. Red and green colors indicate significantly high reporting odds ratio (ROR) for abiraterone and enzalutamide, respectively. CI indicates confidence interval. Asterisk indicates statistically significant difference.

higher vascular disorders toxicity rate. Additionally, men < 70 years had a higher incidence rate of toxicity due to abiraterone than enzalutamide in blood and lymphatic system.

Limitations

Our data cannot account for unbiased data as reporting is mandatory for manufacturers but voluntary for patients and physicians. Additionally, there is variability in data completeness, and information in reports is not verified. We cannot differentiate between tumor stages and grades of

“Our findings suggest that both drugs present a discrete and nonoverlapping toxicity profile that varies by System Organ Class and patient age.”

adverse events. In addition, there was no information about patients’ backgrounds, such as pre-

vious diseases and the evolution of the clinical state.

Interpretation for Patient Care

Our findings suggest that both drugs present a discrete and nonoverlapping toxicity profile that varies by System Organ Class and patient age. This study confirms, for the most part, what has been reported in clinical trials as well as true real-world reports. Additionally, this information can help identify the best candidate for each therapy, considering patient comorbidities and desires. ■

UPJ INSIGHT

Feasibility and Value of a Focal Therapy Multidisciplinary Tumor Board in Prostate Cancer Patients

Tarik Benidir, MD, MS

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Andrew Wood, MD

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Zaeem Lone, BA

Cleveland Clinic Lerner College of Medicine, Ohio

Zeyad Schwen, MD

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Robert Abouassaly, MD

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Jane Nguyen, MD, PhD

Cleveland Clinic Pathology Institute, Ohio

Ruben Olivares, MD

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Christopher J. Weight, MD, MS

Cleveland Clinic Glickman Urological & Kidney Institute, Ohio

Andrei S. Purysko, MD

Cleveland Clinic Imaging Institute, Ohio

Benidir T, Wood A, Lone Z, et al. The feasibility and value of a focal therapy multidisciplinary tumor board, including radiographic and pathological overreads in refining the selection for high intensity focused ultrasound in prostate cancer patients. *Urol Pract.* 2023;10(4):371-378.

Study Need and Importance

Focal therapy is increasingly recognized as an appropriate treatment strategy in well-selected men with prostate cancer. Patients are increasingly seeking treatments that minimize the morbidity of whole-gland radical therapies. Despite encouraging medium-term oncologic outcomes, other publications suggest a meaningful recurrence rate of clinically significant prostate cancer within 1 year of treatment. Re-treatments are associated with a decline in functional outcome, increased complication rates, and a threat to oncologic control. Optimal patient selection is a necessary area of research. The feasibility and value of a dedicated focal therapy tumor board including pathological and radiographic overreads remain unexplored and intriguing.

What We Found

Of the 74 patients prospectively reviewed in our high intensity focused ultrasound focal therapy tumor board, prostate MRI overreads were concordant with the original read in 60% of cases. MRI

overreads excluded 35.8% of patients from being focal therapy candidates. MRI overreads had discordant Prostate Imaging Reporting & Data System (PI-RADS) scores in 25.6% of cases, with numerous lesions being upgraded from PI-RADS 1-3 to PI-RADS 4-5, thus requiring additional workup (see Table). Pathology overreads were performed in 18.9% of patients, among which 20% received grade group reclassification. Following tumor boards, only 25.6% of patients were deemed candidates for focal therapy.

Limitations

This was a single-center study using a single focal therapy modality (high intensity focused ultrasound). Whether the change in focal therapy candidacy will lead to improved oncologic outcomes has yet to be evaluated.

Interpretation for Patient Care

When prostate MRIs are overread with focal therapy in mind, meaningful findings arise which challenge patient candidacy.

Table. Confusion Matrix for Focal Therapy Cohort

Initial PI-RADS score	MRI overread PI-RADS score					Totals
	1	2	3	4	5	
1	2	1	0	1	1	5
2	0	2	0	2	0	4
3	0	0	2	5	2	9
4	0	0	0	28	2	30
5	0	0	0	5	14	19
Totals	2	3	2	41	19	67

Abbreviations: MRI, magnetic resonance imaging; PI-RADS, Prostate Imaging Reporting & Data System.

Bold text indicates concordant finding; italicized, discordant finding; highlighted, discordant finding requiring further investigation.

These include the identification of new nonindex lesions, changes in PI-RADS scores, and the relationship of index lesions with respect to rectum and urethra. Pathology overread also impacts risk group classification. Focal therapy tumor boards should be encouraged at centers that practice this therapy. ■

UPJ INSIGHT

Increasing Role of the Advanced Practice Provider in Men's Health Clinics

Omer A. Raheem, MD, MSc, MCh Urol, MRCS

University of Chicago, Illinois

Monica H. Xing, BA

Pritzker School of Medicine, University of Chicago, Illinois

Caleb A. Cooper, MD

University of Chicago, Illinois

Max J. Hyman, BA

The Center for Health and the Social Sciences, University of Chicago, Illinois

Mohit Khera, MD, MBA

Baylor College of Medicine, Houston, Texas

Parth K. Modi, MD, MS

University of Chicago, Illinois

Raheem OA, Xing MH, Cooper CA, Hyman MJ, Khera M, Modi PK. Increasing role of the

INCREASING ROLE OF THE ADVANCED PRACTICE PROVIDER

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advanced practice provider in men's health clinics: an analysis of Medicare and commercial claims in the United States. *Urol Pract.* 2023;10(4):319-326.

Study Need and Importance

As urological care delivery in the US continues to evolve to meet patient needs, we aim to clarify the role of advanced practice providers (APPs) for publicly and privately insured patients in the treatment of male urological conditions commonly encountered in men's health clinics (testicular hypofunction, erectile dysfunction [ED] and Peyronie's disease [PD], benign prostatic hyperplasia, and scrotal pain). The compositional changes to the urological care team are important to consider in the context of men's health because the increasing involvement of APPs may be a unique mechanism to further bridge men's urology to their general health.

What We Found

From 2010 to 2021, the proportion of APP-submitted service counts for all conditions within the MarketScan group increased up to 5-fold, with benign prostatic hyperplasia representing the greatest growth (Figure 1). The proportion of APP-submitted service counts within the Medicare group increased up to 8-fold, with ED/PD representing the greatest fold change (Figure 2). The proportion of claims submitted by APPs

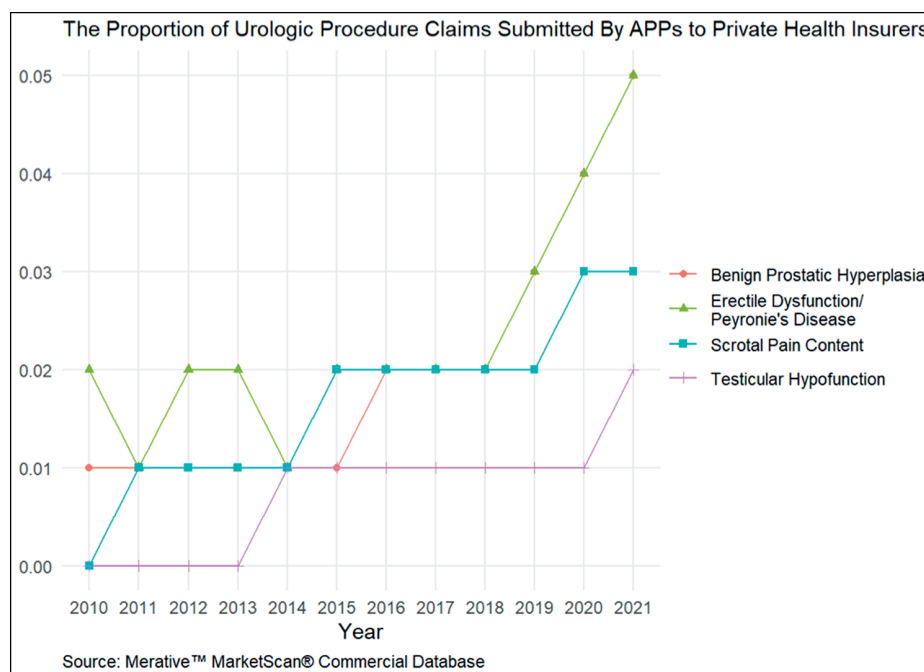


Figure 1. The proportion of urological procedural claims submitted by advanced practice providers (APPs) to MarketScan (2010-2021).

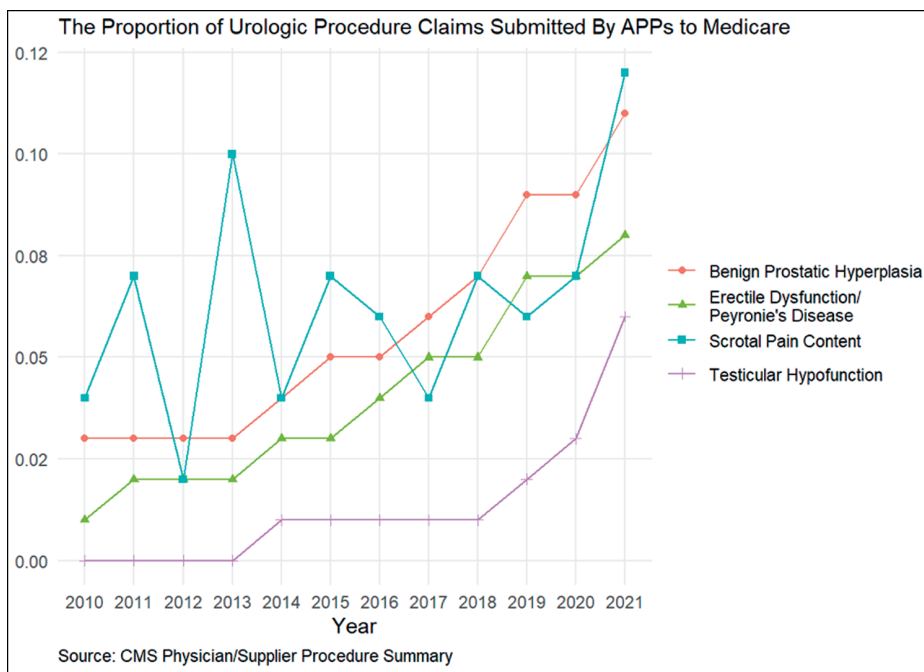


Figure 2. The proportion of urological procedural claims submitted by advanced practice providers (APPs) to Medicare (2010-2021). CMS indicates Centers for Medicare and Medicaid services.

“APPs play a critical role in urological care and can help to improve access to men's health.”

treating all conditions was higher in 2021 than 2010 in both publicly and privately insured groups.

Limitations

While our selected procedures within each condition are commonly seen in men's health clinics, we recognize that the Common Procedural Terminology (CPT) code counts are not exclusively unique to male patients (eg, cystoscopy). Further, as CPT codes only capture procedure type, we were not able to distinguish the clinical indication for each procedure needed to assign each CPT code to a single condition of interest.

Interpretation for Patient Care

The role of APPs in men's urological health is increasing for privately and publicly insured patient populations. These trends are likely to continue with the worsening shortage of urologists, and have implications for clinical care, policy, costs, and the training, supervision, and certification of APPs. APPs play a critical role in urological care and can help to improve access to men's health. ■