



Mount
Sinai

The Milton and Carroll Petrie

Department of Urology

WINTER 2016

CHAIR'S REPORT

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CHAIR'S MESSAGE

Pathways to Fight Disease



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The urologic community continues to focus on one of its greatest challenges: distinguishing aggressive from indolent prostate cancer. Our goal is to successfully treat lethal disease and spare men with lower-risk cancer from undesirable treatment side effects. At the Milton and Carroll Petrie Department of Urology, we are bringing all our forces to bear on this issue through breakthroughs in prostate imaging, intraoperative surgical techniques, and extensive, fast-track genomics-based research.

The articles in this report speak to our commitment to advancing treatment for prostate cancer and to make breakthroughs in treatment for all urological conditions. They demonstrate how we are forging new paths in robotic surgery by profiling a patient with a rare condition who was successfully treated; advancing focal therapy methodology; conducting research on active surveillance, and understanding molecular mechanisms; and introducing renowned physicians who are leaders in urologic cancer and men's health.

Using Robotics to Treat Rare Disease

Chyluria is a rare condition characterized by milky urine due to abnormal lymph flow from the intestines to the kidney, ureter or bladder. It is rarely seen in the United States. The most common cause is a parasitic infection and only a handful of non-parasitic cases have been reported.

A 75-year-old female physician of Indian descent with a known history of persistent chyluria came to the Milton and Carroll Petrie Department of Urology at Mount Sinai seeking definitive treatment after consulting with several physicians over the course of 18 months. She met with Michael A. Palese, MD, Site Chair, Mount Sinai Beth Israel, Department of Urology, Director of Minimally Invasive Urologic Surgery, and an expert in robotic surgery for kidney disease.

The patient's first intervention was a primary ureteroscopy to evaluate her kidney and ureter. She remained in remission for five months until she began to experience chyluria almost daily. She also developed significant right flank pain and small blood clots in her urine. Treatment of prolonged chyluria is crucial because untreated chyluria can lead to malnutrition, anemia, hypoproteinemia, and hypolipidemia. A subsequent evaluation and urinalysis confirmed high triglycerides, high

proteinuria, and a negative evaluation for filariasis and acid-fast bacilli, confirming that her condition was not due to parasitic infection. This case is considered highly unique, because of its unknown origin, the patient's gender (only 14 percent of reported chyluria cases are female), and presentation of atypical right side pain.

Dr. Palese performed a right robotic ureterolysis, renal hilar dissection and intraperitonealization of the ureter to disconnect lymphatic tissue from the ureter and kidney. His decision was predicated on



Michael A. Palese, MD, uses robotic surgery to treat complex urological cases with minimal side effects.

the fact that chyluria patients can have extensive adhesions as well as significant scar tissue along the kidney and ureter. He also performed an omental wrap of the ureter, draping a layer of fat around it to increase blood flow to the area and prevent future scarring. Dr. Palese was confident he would achieve the desired outcome of a rapid recovery with minimal side effects.

The surgery itself took 106 minutes

and estimated intraoperative blood loss was limited to 50 ml. Post-surgery, the patient had clear yellow urine, no complications, and was discharged three days later. A six-month followup revealed no evidence of chyluria. This is the first known successful robotic treatment for chyluria reported in the literature.

How to Keep Prostate Cancer Patients On Active Surveillance

Active surveillance for prostate cancer is rarely a treatment of choice, with only 10 percent of eligible, low-risk prostate cancer patients in the United States opting for it. Additionally, there is evidence that approximately 50 percent of men on active surveillance discontinue the protocol within five years for no clear reasons. To date, no study formally defines or measures patient factors or preferences leading to decisions to discontinue active surveillance and receive curative treatment.

To address this gap, Nihal Mohamed, PhD, and faculty are conducting research among patients on active surveillance at the Mount Sinai Health System. The study examines the acceptability and feasibility of an innovative, care planning intervention, which consists of four modules: education on active surveillance; a care plan for the patient and provider delivered in paper and electronic formats (EHRs); a one-hour, navigator-led session with the patient to screen for distress, unmet needs, and to discuss the care plan; and four navigator-led follow-up calls to continue these assessments.

This is the first time that a psychosocial and educational intervention will be used to increase adherence among active surveillance patients. Using EHR to convey and share follow-up care plans is also novel.

This research has high impact potential, as it addresses an important problem in care planning and symptom management. It has the potential to impact patients' quality of life and satisfaction with care, and communication with providers. There is also high potential for integration and dissemination in the clinic by existing patient navigation staff.



Nihal Mohamed, PhD

Urology Performs Genomic Research for Diagnosis And Personalized Treatment

The Milton and Carroll Petrie Department of Urology has ambitious goals for bench-to-bedside prostate cancer research. Most new drugs take 10 years and \$1 billion to arrive in the market; the objective of the Department of Urology Laboratory and our Richard LeFrak Young Investigators is to achieve a turnout time of five years from research/discovery to benefit.

Personalized treatment is the focus of research being directed by Kamlesh Yadav, MTech, PhD, Assistant Professor, Urology, Icahn School of Medicine at Mount Sinai. His research comprises tumor modeling and genomic susceptibility analysis. The goal of tumor modeling is to identify best drug sensitivity and minimize resistance to treatment. Patient tumors are allowed to grow in the lab and treated with various drugs to ascertain the most responsive sensitivities. Tumors are then sequenced to identify the genomic alterations that drive tumorigenesis and then predict best drug combinations. The team has sequenced more than 20 treatment-naïve tumors to date.

Another aspect of Dr. Yadav's research is



Jennifer Stockert, PhD, works in the Department of Urology Laboratory, where research is being conducted on the genomic causes of prostate cancer.

exploring drugs already approved by the U.S. Food and Drug Administration for different disease states for possible treatment of end-stage prostate cancer. He is looking at the collective cell expression profile of prostate cancer and utilizing a computational program to match drugs that antagonize the tumor profile. We are partnering closely with the Department of Genomics on this effort. Currently, five drugs are being investigated at the cellular level and there are two lead compounds at various stages of pre-clinical trials in mice.

Sujit S. Nair, PhD, has a research goal to understand molecular mechanisms and functional validation of transcriptional, epigenetic and genome surveillance roles of chromatin remodelers, immunomodulators, and histone-modifying enzymes—lncRNA and miRNA—in prostate cancer. He is pursuing studies on understanding tumor immunology and impact on prostate cancer progression, and reciprocal crosstalk between diabetes and prostate cancer, using a combined genomic and proteomic approach.

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Robotic Technique Spearheads Mount Sinai's Comprehensive Kidney Cancer Program

First Assistant Sparing Technique (F.A.S.T.), the robotic partial nephrectomy developed by Ketan K. Badani, MD, Vice Chairman, Urology and Robotic Surgery, and his team, is at the forefront of the Mount Sinai Health System's Comprehensive Kidney Cancer Program. The technique specifically aims to reduce warm ischemia time to the kidney, preserve maximal normal renal function, and minimize complication risk. The implementation of this technique has led to lower operative times (~160 minutes total), lower ischemia time (~14 minutes) and ultimately improved renal function outcomes for patients undergoing nephron-sparing surgery. The F.A.S.T. approach has been taught and demonstrated throughout the United States at national meetings, and internationally in eight countries.

The Comprehensive Kidney Cancer Program also is the primary site for the Mount Sinai Kidney Cancer database, one of the largest multi-institutional kidney cancer databases in the world. Directed by Dr. Badani, this collaborative database is a global initiative of high-volume kidney cancer surgery centers. It currently has data from more than 1,100 patients who have had robotic kidney surgery with long-term, follow-up information. The database contains some of the most granular kidney cancer data in the country, which allows us to determine not only the cancer control benefits of partial nephrectomy, but long-term kidney function and quality of life outcome for patients. It includes patient data not captured by administrative databases and data that clinicians



From left, Ketan K. Badani, MD, and former Fellow Mike Whalen, MD, using real time intraoperative ultrasound during a robotic partial nephrectomy.

have not yet captured in high volume (e.g., clamping techniques and the amount of healthy kidney removed during partial nephrectomy).

Many other centers of excellence have adopted the principles of F.A.S.T. and similar databases as the best way to foster improved clinical decision-making and outcomes for patients with kidney cancer, and continue to improve the procedure.

Refining Technology to Advance Focal Therapy

The Mount Sinai Health System is at the forefront of diagnostic imaging for prostate cancer, specifically ultrasound-guided fusion biopsy. We now provide patients with these state-of-the-art biopsies when prostate cancer is suspected. In July 2015, Art Rastinehad, MD, Associate Professor, Urology and Radiology, Icahn School of Medicine, was the first urological specialist to perform a transperineal biopsy using the UroNav system. Biopsies conducted via a transperineal route have been demonstrated to reduce infections that are more likely to occur through a transrectal approach.

We are one of only two test centers in the world collaborating with Philips Health Care, the maker of UroNav, to help refine fusion biopsy technology and develop applications for guided focal therapy—a treatment option that relies on targeted imaging that has been gaining acceptance by urologists utilizing various approaches but is still considered emerging, as researchers work on modifications to achieve cancer



Art Rastinehad, MD, and Michael Carnick, RT, review targets after a MR US fusion guided prostate biopsy.

control and minimize damage to healthy tissue. A key element in meeting this objective is testing new technologies that can facilitate precise placement of the optical fiber catheter within or adjacent to the prostate lesion targeted for ablation.

To that end, Mount Sinai is embarking on a gold nanoparticle directed focal therapy trial, the first one of its kind. In preclinical studies, gold nanoparticles (AuroLase Therapy) have been shown to provide highly selective and rapid tissue destruction with minimal damage to surrounding tissue, enabling a potentially curative treatment of tumors with minimum toxicity. Gold nanoparticles are able to actively target and conform to areas of high vascularity associated with abnormal tissue growth within the prostate. Dr. Rastinehad is national co-principal investigator of this study in partnership with Steven Canfield, MD, University of Texas Medical School at Houston, and Joshua Stern, MD, Albert Einstein School of Medicine and Montefiore Medical Center in New York.

The objective of the trial is to determine the efficacy of using MRI/US fusion imaging technology to direct focal ablation of prostate tumors/tissue using laser-activated gold nanoparticle-directed ablation in human subjects while assessing adverse effects attributable to the treatment. Another presumed outcome is a lower incidence of erectile dysfunction and urinary incontinence compared to other types of prostate cancer treatment.

› Urology Performs Genomic Research for Diagnosis and Personalized Treatment *continued from page 2*

Dr. Nair is also working on a collaborative initiative between the Department of Urology and Manya Mascareno, PhD, SUNY College, Downstate, to validate the prognostic role of HEXIM1 in prostate cancer. One of the study's major objectives is to evaluate levels of tyrosine phosphorylated HEXIM1 in tissue microarray with clinical outcome data and determine if HEXIM1 is a good biomarker to distinguish between indolent and aggressive disease, independent of clinicopathological

variables and current biomarkers.

Shalini Singh, PhD, Instructor, Urology, Icahn School of Medicine, is analyzing prostate cancer heterogeneity using next-generation sequencing approaches. She is focusing on the use of cutting-edge single cell genomics and transcriptomic approaches to develop simple, non-invasive diagnostic tests for prostate cancer. She leads research projects focused on understanding spatial and temporal

heterogeneity; disparities in prostate cancer incidence and death rates between black and white men; and the role of tumor microenvironment in tumor growth.

The Department of Urology is working with the Department of Medical Oncology on the viability of a vaccine to be administered before surgery that would boost a patient's immune system to halt tumor growth. It is the first study of its kind to use the RNA molecule Hiltonol (polyICLC).

NEW FACES



Steven A. Kaplan, MD, Co-Director of the Men's Wellness Program, is an internationally recognized authority and a primary thought leader in the study of benign prostate diseases, the association of metabolic factors with voiding dysfunction, and female urology. His landmark study changed the way medications are used in treating men with symptoms

related to both benign prostate enlargement and bladder dysfunction.

A graduate of the Icahn School of Medicine, his postgraduate training included an internship and residency in the Department of Surgery at The Mount Sinai Hospital, and a residency in Urology at Columbia University's Squier Urologic Clinic.



Hugh Lavery, MD, is Assistant Professor of Urology, Icahn School of Medicine, and Regional Director of Urology, Elmhurst Hospital Center and Queens Hospital Center. He has been a research faculty member in the Department of Urology since 2010.

He attended medical school at the University of Connecticut, and completed his urology residency at the Ohio State University Medical Center. His research interests include clinical and outcomes-based research with a focus on prostate and bladder cancer. He has written more than 30 peer-reviewed publications and serves as a peer reviewer for many urologic journals.



Jay Motola, MD, is Attending Physician, Department of Urology, Mount Sinai West, and Assistant Professor of Urology, Icahn School of Medicine. He earned his medical degree at the State University of New York at Stony Brook, and completed general surgery and urology residencies at Long Island Jewish Medical Center.

He is active in the American Urological Association (AUA), and is the National Chairman for Practice Management. He serves on the AUA's IT committee and the Health Policy Council, and is presently Secretary of the New York Section of the American Urological Association.



Peter Wiklund, MD, is Professor of Urology, Icahn School of Medicine, and Director of the Bladder Cancer Surgery Program. He pioneered robot-assisted cystectomy and totally intracorporeal neobladder diversion in 2003 at Karolinska Institute, Stockholm. He is recognized worldwide for his expertise in urologic robot-assisted surgery.

Dr. Wiklund has coordinated several multi-institutional studies, and currently is chairman of the scientific working group of the robotic surgery section of the EAU. In addition to more than 200 peer-reviewed original publications and 30 review articles, Dr. Wiklund has edited and contributed to three textbooks on robot-assisted surgery in urology and numerous textbooks on oncological urology.



Sijo Parekattil, MD, is an Associate Clinical Professor at the Icahn School of Medicine. He currently serves as Co-Director of The PUR Clinic (Personalized Urology & Robotics) at South Lake Hospital & Orlando Health.

Dr. Parekattil completed his urology residency training at Albany Medical Center and then went on to complete dual fellowship training at the Cleveland Clinic Foundation in Laparoscopy/Robotic Surgery and Microsurgery/Male Infertility. His interests are in surgical techniques that incorporate technology, robotics, and microsurgery.

He has accomplished pioneering work in the arena of robotic microsurgery and has performed more than 1,000 such procedures. Dr. Parekattil has developed a multidisciplinary program dedicated to the treatment of male infertility and groin/testicular pain. He also is a Visiting Professor at the University of Zambia, Lusaka, Africa.

Dr. Parekattil is a founding board member of the Robotic Assisted Microsurgical & Endoscopic Society (RAMSES), a group focused on the evidence-based development of tools and platforms for robotic-assisted microsurgery; and the International Microsurgical Simulation Society (IMSS), a group that is developing more standardized and effective microsurgical training techniques. He is on the foundation board for Florida Polytechnic University.