Robotic Prostate Surgery at Mount Sinai

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Overview

Our robotic prostate surgery program is led by Ashutosh (Ash) K. Tewari, MBBS, MCh, Chairman of the Department of Urology and one of the world’s foremost researchers and surgeons in the field of prostate cancer. A pioneer of daVinci® robotic surgery for prostate cancer, Dr. Tewari has performed more than 5,500 robotic prostatectomies (surgery to remove the entire prostate), making him one of the most skilled and experienced robotic surgeons in the world—expertise that is especially important if you are considering robotic prostatectomy where successful surgery depends more on the skill and experience of the surgeon than on the technology. Dr. Tewari performs all aspects of surgery himself and ensures that all patients receive the best possible care. Importantly, our Precision Urology™ approach involves integration of clinical, genomic, molecular and pathological imaging data for diagnosis and treatment decision-making so that men with prostate cancer can be assured of our commitment to diagnosis and achieving excellent outcomes while minimizing the side effects of treatment. Dr. Tewari also has one of the largest active surveillance (wait to treat) programs so men at lower risk for aggressive cancer can be monitored until intervention is warranted.

We offer all treatment modalities for prostate cancer, including focal and targeted therapy and collaborate very closely with radiation therapy and medical oncology experts to provide every currently available treatment. In collaboration with the Tisch Cancer Center, we oversee clinical trials that provide cutting edge care in the hands of our physicians.
Dr. Ash Tewari is an innovator in the fields of robotic prostate cancer surgery and prostate cancer treatment. He was a pioneer in the performance of a completely athermal technique (no use of cautery or heat energy) during robotic prostatectomy in order to minimize the damage to the nerves responsible for erectile function. Dr. Tewari developed the total reconstruction technique, where the support structures of the urinary mechanism are restored following prostate removal, for faster continence recovery. In addition, he was the first to publish a catheter-less robotic prostatectomy where a urethral catheter is avoided in order to minimize pain and discomfort after surgery. Dr. Tewari was the first to identify the nerves responsible for erectile function as a neural hammock. He also described various grades of nerve-sparing that utilize information from MRIs and allow for incremental nerve-sparing even in cases that would not have qualified for nerve-sparing without this graded approach. This increased understanding of the prostate anatomy aids in nerve-sparing prostate surgery techniques.

He has described traction free and athermal nerve-sparing techniques and in 2012 developed a novel Detrusor wrap technique for early urinary continence. Working with genitourinary pathologists and scientists from the University of Hamburg, he is currently evaluating the role of MRI-guided NeuroSAFE® and sphinctersafe approaches in expanding opportunities for nerve-sparing.

As an active researcher and surgeon scientist, he is one of only a few robotic surgeons to be awarded a NIH R01 grant. This funding is for the investigation of real-time tissue identification during prostate cancer surgery.
Robotic Prostate Surgery Technique

**ART™**

The robotic prostate surgery approach used by Dr. Tewari is known as ART™ (Advanced Robotic Technique) prostatectomy, or ART™ for short. It is a highly successful approach to curing prostate cancer while minimizing side effects in select patients. Dr. Tewari and his team have developed and refined ART™ over the past decade based on the thousands of surgeries they have performed, their discoveries in prostate anatomy, and other leading-edge research. ART™ is highly individualized, reflecting a patient’s unique anatomy, cancer location and neural structure. Indeed, for Dr. Tewari, ART™ is truly an art. He routinely makes anatomical drawings of prostates on which he operates in order to map out a cancer’s spatial relationships to the fascia, muscles and nerves that surround the prostate. By drawing the anatomy of individual cases, he continues to fine tune ART™ and improve cancer control while sparing nerves. He also uses the drawings as a teaching tool for students as well as his peers worldwide who are eager to learn his technique.

Precision Urology™

At Mount Sinai, our Precision Urology™ approach involves integration of multiple variables and imaging data in a decision support system. This is key in assuring men with prostate cancer of our commitment to a patient-centric, personalized diagnostic approach and excellent outcome while minimizing the side effects of treatment. Precision Urology™ reflects our utilization of advanced technologies and incorporation of molecular and genomic analysis to identify markers of aggressive disease. This allows us to rigorously stage disease to determine if intervention is needed and if so, tailor the treatment accordingly.
The crux of the ART™ technique is the delicate removal of the prostate from the top of the nerve hammock with maximal clearance for preserving sexual and urinary function. Not only are nerves not handled, but oxygenation of the nerves is monitored during this phase of the technique so these preserved nerves are greater in number and also healthy and vascular.

The ART™ approach consists of not just one technique but a group of techniques. Among the approach's many distinct features and benefits are:

**Precise diagnosis through state-of-the-art evaluation** — We use a new technique known as targeted biopsy to diagnose prostate cancer. This technique fuses highly detailed MRI (magnetic resonance imaging) with real-time ultrasound using the Artemis device. The procedure typically takes between 15 to 20 minutes and is done in our office under local anesthesia. It provides highly accurate information about the location of cancer and its relation to nerves and sphincters. Mount Sinai is one of a few medical facilities in New York City to have the Artemis device.

**Cancer control** — ART™ has proven to provide lower margin rates (less residual cancer) than other robotic techniques being performed by leading robotic surgeons (less than 10% positive margins versus 10% - 30%). As a consequence, there is less need for radiation and hormone therapy post-surgery and men have less reason to feel anxious about future rises in their PSA.

Our program is one of the few in the world where pathologists are on stand-by to provide real time rapid interpretation of the entire prostate margin rather than of small pieces of tissue when
they are taken for a frozen tissue biopsy. This rapid pathology provides an additional element of security that cancer has not been left behind while we are working to preserve nerves.

**High rates of erectile function recovery** — The aim of ART™ is to preserve every nerve fiber responsible for the fine balance between erection, orgasm, and bladder function. The benefits of the ART™ technique for sexual function are significant. ART™ allows for stronger erections and orgasms, a reduction in penile shrinkage and a reduction in the risk of climacturia (involuntary release of urine at the moment of orgasm).

In order to protect the delicate nerves involved, which do not handle heat, traction, or manipulation very well, we use a nerve-sparing, completely athermal and “traction free” technique (no use of cautery or heat energy) during robotic prostatectomy—a technique pioneered by Dr. Tewari and his team. Fully 87 percent of patients who experience normal sexual functioning and are candidates for nerve-sparing, return to normal sexual function after ART™ surgical treatment. Our best case scenario is when patients are young, cancer is early and organ-confined, and baseline sexual functions are very high. Dr. Tewari can perform Grade I nerve-sparing that can achieve 93% potency (ability to have intercourse) with or without use of oral medications.

**Faster return to urinary continence** — ART™ incorporates a novel surgical technique to minimize or prevent urinary leakage, even with exertion, and provide a strong urinary stream. It involves reconstruction of the supporting structures responsible for urinary continence that are typically either removed or disorganized during removal of the prostate. In 2012, Dr. Tewari developed a Detrusor wrap procedure that creates an additional wrap that serves as a sphincter and sling to provide enhanced and accelerated return to continence. Ninety-seven percent of our patients who are continent before the surgery are continent 18 months after surgery.

In addition, with the ART™ technique, patients and their families have been able to benefit from faster convalescence, short hospital stays, small incisions with less scarring, significantly less blood loss during surgery, and less pain following surgery. The majority of our patients are discharged and return home within 24 hours of their robotic surgery.
Technologies

Artemis

Artemis is an imaging device that allows 3D prostate visualization and tracking. By fusing multi-parametric MRI with real-time ultrasound, abnormal or suspicious areas seen on the MRI can be tracked and targeted during a prostate biopsy. Artemis offers sophisticated recording of actual biopsy sites sampled so sites can be reviewed at any time.

The technique is done in two steps. First an MRI is done and the studies are loaded onto a software where the radiologist marks the prostate gland and the regions of interest for biopsy. This is known as segmentation. This information is then loaded onto Artemis for a targeted biopsy. This can be done in an outpatient setting under local anesthesia within a few minutes.
**daVinci Robot**

The *daVinci* Surgical System is a sophisticated robotic platform designed to expand the surgeon’s capabilities and offer a state-of-the-art minimally invasive option for prostate surgery. With *daVinci*, small incisions are used to insert miniaturized wristed instruments and a high-definition 3D camera. Seated comfortably at the *daVinci* console, Dr. Tewari views a magnified, high-resolution 3D image of the surgical site inside your body.

At the same time, the latest robotic and computer technologies scale, filter and seamlessly translate Dr. Tewari’s hand movements into precise micro-movements of the *daVinci* instruments. Although it is often called a “robot”, the *daVinci* System cannot move or operate on its own; Dr. Tewari is 100% in control.
3 Tesla Multiparametric MRI

3 Tesla Multiparametric Magnetic Resonance Imaging is a state of the art, non-invasive imaging modality that facilitates diagnosing, staging and pre-operative planning for prostate cancer. Magnetic waves create images of the prostate and surrounding tissue. Using advanced computer algorithms, these images can be processed to predict where prostate cancer lesions are located.

Intraoperative real time pathology – NeuroSAFE™

NeuroSAFE™ allows the assessment of surgical margin for absence or presence of cancer intra-operatively, allowing the surgeon to perform adequate nerve-sparing and resecting more tissue if necessary to ensure oncological safety.
Genetic Analysis

DNA/RNA sequencing

Our researchers are working to unravel the genetic factors linked to prostate cancer. Genetic screening can pick up mutations in an individual’s genetic code that may increase the risk of advanced prostate cancer. We combine genetic information with advanced imaging and immunohistochemistry to determine prostate cancer risk and staging. We design prostate cancer screening plans tailored to each patient’s risk profile.
Post-Surgery Rehabilitation Program

The Department of Urology is staffed with qualified medical professionals who provide in-office expert guidance on sexual function, continence, nutrition, exercise, stress management and alternative medicine options for post-surgical recovery and rehabilitation.

Continence

Almost half of men who undergo radical prostatectomy experience incontinence immediately after surgery. For most men this condition resolves quickly (within six months), but for others voiding dysfunction persists beyond a year resulting in both physical discomfort and emotional upheaval due to forced lifestyle changes. Fortunately, multiple treatment options are available, and in the hands of continence experts, can be tailored to a patient’s medical history, physical condition as well as personal preference. Dr. Neil Grafstein is the Director of Reconstructive Surgery, Female Urology and Voiding Dysfunction at Mount Sinai and oversees continence rehabilitation for our prostatectomy patients.

Behavioral training is a helpful first step for SUI and Dr. Grafstein advises patients to start shortly after surgery. Pelvic floor exercises (referred to as Kegels or PEMs), timed voiding, double voiding and reduced fluid intake are all behavioral strategies that can significantly facilitate urinary control.

Men whose incontinence does not respond to behavioral training or resolve within six months to a year can consider minimally invasive surgical options that are highly successful, specifically the male urethral sling and the artificial sphincter. Dr. Grafstein was one of the first urologic surgeons to perform Advance sling implantation and is one of the most experienced surgeons in the country doing sling procedures. At Mount Sinai this minimally invasive surgery is often done on an outpatient basis.

Sexual Function

Penile rehabilitation can play an important role in speeding the ability to resume sexual functioning. Studies show that going for too long without blood flow to the penis may damage muscle and tissue within the penis, thereby affecting a man’s ability to have erections again on his own. The goal of penile rehabilitation is to keep the penile tissue and muscles oxy-
generated and stretched to preserve erectile function while the nerves in the penis fully recover. At Mount Sinai, we encourage our patients to start working on penile rehabilitation even before surgery.

Pre-operative visits could include early evaluation, penile Doppler studies (a test of blood flow into and out of the penis), and testosterone level estimations if our experts, led by Dr. Natan Bar-Chama, Director of Male Reproductive Medicine, feel that your particular case could benefit from these evaluations. Occasionally we start penile rehabilitation using medications a few weeks before surgery. This approach in certain cases may enhance the blood supply to the penis and serve as a jumpstart for sexual rehabilitation.

Post-operative rehabilitation usually starts a few weeks later and may include using intra-urethral suppositories, oral medications and vacuum device therapies as well as other approaches to maximize your chances of recovery. We are committed to working with you and your partner to find the best therapy for you as a couple.

**Holistic Medicine/Diet and Nutrition/Acupuncture/Yoga**

Achieving the best outcomes is a major reason patients all over the world seek out Dr. Tewari for treatment. But they also value his compassionate and caring manner and holistic approach to treating prostate cancer.

Dr. Tewari believes that diet and exercise are key components of disease prevention and management. Moderate exercise and activity prior to prostate cancer surgery is recommended to promote healing and includes “Prostate Bootcamp” where patients are asked to walk up to 3 miles daily.
Advanced Prostate Cancer

Advanced prostate cancer is disease that has spread beyond the prostate gland to the lymph nodes, bones or other areas and is referred to as metastatic. At The Mount Sinai Hospital, our multidisciplinary team of outstanding physicians offers the latest research-backed services for the diagnosis and treatment of metastatic disease. We are utilizing all standard and newly approved chemotherapy, anti-androgen and immunotherapeutic treatments to help our patients with metastatic and castrate-resistant metastatic cancer.

The Department of Urology in collaboration with the Tisch Cancer Institute is actively researching new treatments for advanced cancer. We have experts in prostate cancer immunotherapy and vaccines to achieve better cancer control. We were instrumental in the studies leading to the approval of Provenge®, the only vaccine approved to treat metastatic prostate cancer, and we are currently exploring optimal dosing, long-term side effects and its use in combination with other emerging agents.

Dr. William Oh
Associate Director, Tisch Cancer Institute
Men’s Health

The Department of Urology’s Men’s Health program provides men of all ages with comprehensive assessment, diagnosis, treatment and management for some of the most common disease states affecting men, including prostatitis, benign prostatic hyperplasia (BPH), erectile dysfunction, incontinence, low testosterone, and sexually transmitted diseases. We also perform risk profiling for men wishing to understand the likelihood of their developing prostate, kidney and bladder cancer.

Our multidisciplinary program is directed by Dr. Tewari and Leslie Schlachter, Senior Physician Associate. When appropriate, timely and priority access to expert specialists within the Mount Sinai Health System is arranged for our patients.
Our Office

Our office is dedicated to serving men with prostate and men’s health issues. Our team includes two certified physician associates, a registered nurse and nurse practitioner and two medical assistants. Our practice manager, surgical scheduler and patient-care coordinator are dedicated to making your office visit with us easy and stress free.

Patients are seen at our spacious office at 625 Madison Avenue (Madison Avenue between 58th and 59th Streets) in Manhattan, convenient to both subway and bus transit. Discount parking coupons are available for patients for a public garage located one block from the office.

Please feel free to ask us questions at anytime. We can be contacted at 212-241-9955. For more information about Dr. Tewari, ART™ and services of the Mount Sinai Health System, please visit www.mountsinai.org/roboticprostate.
Our Team

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References


