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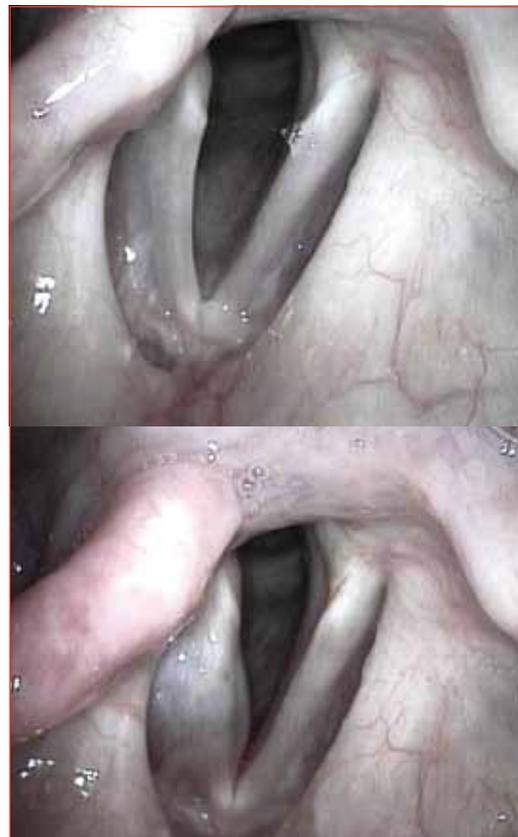
For the physicians in the Departments of Otolaryngology at NewYork-Presbyterian/Columbia University Medical Center and NewYork-Presbyterian/Weill Cornell Medical Center, the operating room (OR) often serves as the frontier for new treatment options involving novel procedural techniques and advanced technologies that improve long-term patient outcomes.

However, for nationally recognized laryngologist Lucian Sulica, MD, it is increasingly his office rather than a hospital OR where he has found success using new approaches and tools to treat patients with hoarseness, dysphagia, and other symptoms caused by a wide range of vocal cord problems.

Dr. Sulica, who is Director of Voice Disorders/Laryngology and Associate Attending Otolaryngologist at NewYork-Presbyterian/Weill Cornell, as well as Associate Professor of Otolaryngology at Weill Cornell Medical College, said that by evaluating and treating voice disorders in the office setting rather than in the OR, he is practicing laryngology both at the cutting edge and as it was customarily practiced more than a century ago.

"Practicing in the office represents a historical return because originally, laryngology treatment took place in the office. Laryngology moved to the OR as the field demanded more precision, beyond what office equipment could provide," Dr. Sulica said. "But now, because of dramatic improvements in endoscopic imaging as well as treatment tools, we're able to bring those procedures back into the office. That means we are able to treat a much larger number of patients, including patients too frail or ill for a general anesthetic, patients whose symptoms may not be severe enough to justify a trip to the OR, or simply patients who do not want to undergo a general anesthetic."

When patients present with voice symptoms such as hoarseness, fatigue, spasms, and/or limitations in vocal volume and pitch, Dr. Sulica may determine the optimal diagnosis by using high-definition strobovideolaryngoscopy to visualize the vocal folds during phonatory vibration, employing



The appearance of the larynx of a 37-year-old man with idiopathic right vocal fold palsy before (above) and after (below) awake office injection of carboxymethylcellulose gel.

electromyographic techniques borrowed from the field of neurology to identify vocal fold neuropathy, or performing biopsies to obtain a tissue diagnosis on any discovered masses. Often, a combination of several diagnostic tools is used, all within the office.

"Many patients who are hoarse, and the cause is not evident immediately following a standard office examination, are given a diagnosis of reflux," noted Dr. Sulica. "Unfortunately, that diagnosis very often is incorrect if the chief complaint is voice-related," and these patients undergo a gamut of unnecessary gastroenterology tests. "In fact, the

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Robotic Applications and Operating Room Technology Are Transforming the Post-Op Surgical Experience

Building on the concept of minimally invasive procedures, robotic surgical approaches performed at NewYork-Presbyterian Hospital are vastly improving the patient experience. Real-time imaging in the operating suite combined with continually advancing robotic systems offer the potential for greater precision with less trauma, less scarring, less blood loss, and quicker healing. Surgeons are driving the advances, and there are programs at both NewYork-Presbyterian/Columbia University Medical Center and NewYork-Presbyterian/Weill Cornell Medical Center that create an environment that encourages their rapid implementation.

“Our surgeons are the ones driving robotic applications. My goal is simply to ensure we are setting up our operating rooms [ORs] to facilitate these innovations,” said John C. Evanko, MD, MBA, who is Medical Director of Perioperative Services at NewYork-Presbyterian/Columbia and a gynecologic surgeon. Dr. Evanko—whose expertise with the da Vinci Surgical System includes a

minimally invasive approach to treat uterine fibroids, as well as other gynecologic surgeries—reported that real-time imaging has been fundamental to creating the modern OR, which is capable of offering minimally invasive endovascular procedures, as well as radiologic-guided interventional, cardiothoracic hybrid, and robotic procedures.

“ORs for minimally invasive endovascular procedures provided a head start because they were set up for real-time imaging and had the structure and size to accommodate the equipment and connectivity that we need for robotic procedures,” explained Dr. Evanko, who works to assist OR innovation at NewYork-Presbyterian/Columbia. “Minimally invasive surgery overall and robotics in particular are now being used effectively across specialties, including gynecology, urology, otolaryngology, and thoracic and general surgery.”

Urology

In urology, Ashutosh K. Tewari, MD, led much of the pioneering work in robotics at NewYork-Presbyterian/Weill Cornell. Dr. Tewari, who is Director of the Prostate Cancer Institute and the LeFrak Center for Robotic Surgery, has performed more than 5,000 robotic-assisted urologic procedures, and is widely recognized for this work. Data from a recently published meta-analysis of 79 studies suggested robotic-assisted prostatectomies are at least as effective by essentially any measure, particularly in regard to the proportion of patients who achieve cancer-free margins, but generate fewer complications.¹

“Robotic surgery was initially attractive because of the visualization,” Dr. Tewari explained. “While the precision of robotic excisions is an important advantage, the ability to visualize the anatomy in the structural context that can be lost in an open approach has been the most important attribute. There is also significantly less bleeding, which

can also obscure the anatomy when performing a reconstruction.” However, other advantages, such as reduced blood loss, have followed.

The work by Dr. Tewari has greatly advanced the use of robotic procedures for a broad array of urologic surgical procedures, including resection of benign hypertrophy, and he has now assembled one of the most important facilities in the world for this approach. NewYork-Presbyterian/Weill Cornell’s LeFrak Center for Robotic Surgery has several unique features. In addition to a large endowment that has permitted the Center to upgrade imaging capabilities and to employ multiple robotic systems, a comprehensive therapeutic program includes a multidisciplinary team to focus on recovery with emphasis on sustaining a good quality of life.

“There are several exciting developments that will generate further evolution in the field,” Dr. Tewari said. “For example, I think there will be synergy between the technological advances made in robotics and genomic advances, which will allow us to provide individualized care to the characteristics of the malignancy. However, robotic-assisted surgery in urology is a mature platform at our Center. Our outcomes validate that this approach provides advantages over an open approach.”

Ketan K. Badani, MD, Director of Robotic Surgery at NewYork-Presbyterian/Columbia, leads one of the largest robotic oncology programs in urology. Aside from his novel work in improving urinary and sexual outcomes after robotic prostatectomy, his most recent breakthroughs have been in treating kidney tumors. “Our new technique, coined the FAST [for First Assistant Sparing Technique] robotic partial nephrectomy, has shown that, using the robotic platform, we can remove the tumor portion of the kidney while leaving the normal kidney that will continue to function in the body.² A major



NewYork-Presbyterian Hospital is improving their patient care by implementing new, advanced robotic systems that help to improve the patient experience.

advantage to this minimally invasive approach is that we can save time during the critical portion of the procedure when the blood flow to the kidney is stopped—ie, the warm ischemia time,” Dr. Badani said. Additionally, Dr. Badani is doing pioneering work using near-infrared technology during robotic surgery to identify cancer tissue from normal healthy kidney tissue in real-time in the operating room. “This is the single most important technologic breakthrough over the past year in robotic surgery, and we are actively leading the way,” Dr. Badani said.

Oncology

“A major focus for us at Weill Cornell Cancer Center is working to improve the quality of our patients’ lives, leaving them with less morbidity from our treatments so they go on to live fruitful lives without any long-standing detriment. I think in that regard, robotics plays a major role,” said Kevin Holcomb, MD, Director of Minimally Invasive Surgery of the Department of Obstetrics and Gynecology, NewYork-Presbyterian/Weill Cornell. He added that his team is studying robotic-assisted surgery, which involves the use of the da Vinci Surgical System, in gynecologic cancers other than those for which it has already demonstrated benefit, such as in endometrial cancer. “We’ve been performing many robotic surgeries for recurrent ovarian cancer, and really pioneering this,” said Dr. Holcomb, who instructs other surgeons on the technology. “Recently I was able to debulk a patient’s ovarian cancer robotically. She was rendered in complete clinical remission with a surgery that

lasted about 2 hours and she didn’t have to stay in the hospital overnight. I think that is a huge benefit and it isn’t being offered in many places.”

Additionally, patients contraindicated for a minimally invasive surgical approach, such as the morbidly obese and patients with severe comorbidities, also have shown positive outcomes when robotics were employed for surgery. “We’re routinely approaching these patients and doing complete staging with robotic assistance,” Dr. Holcomb said. “Obviously, performing primary abdominal surgery in the instance of big, bulky abdominal disease is problematic, but we are finding that there is a role for robotic-assisted surgery. There is the patient who has an isolated recurrence after 3 years of being disease-free, for example, or the patient who has undergone chemotherapy and whose tumor shrank appreciably—very often, I elect to go back and handle these types of cases robotically. They’re not necessarily getting a survival benefit from it, but there is a huge benefit for quality of life.”

Otolaryngology

It is this patient orientation that has driven the interest of surgeons at NewYork-Presbyterian Hospital since the early days of the movement toward minimally invasive resections. This has produced a proactive approach to developing ORs that can accommodate technological advances, such as real-time imaging and high-definition monitors that display laboratory results and other information relevant to the case. Some ORs incorporate teleconferencing that permits rapid communication with

pathologists or other specialists who might influence decision-making during the course of the surgery.

At both NewYork-Presbyterian/Columbia and NewYork-Presbyterian/Weill Cornell, this type of forward thinking has allowed surgeons across specialties to move quickly into robotic-assisted surgery where appropriate. One example is otolaryngology, where robotic-assisted excision of oral pharyngeal cancer has been in place for almost 4 years.

“Robotic procedures are replacing the major surgeries, which included mandibular resection in order to reach the back of the tonsil to remove these tumors,” said David I. Kutler, MD, Associate Professor of Otolaryngology at NewYork-Presbyterian/Weill Cornell. “With the robot, we can access these tumors through the mouth, without any incisions made to the face, and still do an oncologic procedure to remove these cancers. The time in surgery has been reduced from upwards of 10 hours to about 2 hours; hospitalization has been reduced from 2 weeks to 4 days. Robotic surgery also circumvents the need for chemotherapy and high-dose radiation therapy.”

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tendency to diagnose reflux has become so pronounced that patients with hoarseness are more likely to be referred for esophagoscopy than for stroboscopy, a means of evaluating the larynx, and that makes little sense. Carefully performed stroboscopy, sometimes in conjunction with our other

diagnostic tests, is almost always able to identify the cause of hoarseness at the sound source—the vocal folds.”¹

Injection augmentation is a tried and tested therapy for vocal cord paralysis, paresis, atrophy, and some cases of scarring, and is usually performed in the OR under general anesthesia to better control outcomes. However, Dr. Sulica said,

“this is rarely necessary, and, in fact, performing injections in the office gives a much better sense of how the anatomy of the vocal fold is changing and where the injected material is going because you are able to assess the vocal fold in action.” At Weill Cornell, Dr. Sulica and other researchers compared the benefit

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of injection augmentation performed in the office, at the inpatient bedside, or in the OR. Results from 460 augmentations (236 in awake patients in the office) found that the procedure was well tolerated, with awake patients experiencing success rates similar to those of patients who received general anesthesia; additionally, both groups experienced equivalent—and low—complication rates.²

Dr. Sulica reported that he has performed this procedure in the office for 7 years because the office setting offers similar benefit to OR injections, but without use of an IV, administration of narcotics, or use of general anesthesia, all of which are standard in OR-based surgery. This approach also allows the physician to perform treatment promptly, without waiting for available OR time. Also, patients can begin vocal rehabilitation with therapists at the Hospital's Department of Otolaryngology sooner than if surgery were performed.

The benefits of in-office procedures extend to coagulation or ablation of vocal fold masses with angiolytic laser technology, a type of laser that focuses on the wavelength of the color red for a highly specific delivery of laser energy, reducing the potential for scar from the more commonly used CO₂ laser. When “used

with different power parameters, vascular lesions, polyps, and other pathologies that would have required a trip to the OR can sometimes be addressed in the office,” Dr. Sulica said. Dr. Sulica and colleagues have studied the use of lasers in the office along with endoscopic imaging technology and found that their use is safe and effective for many lesion types, especially when the laser type is optimized for the condition.³

Ongoing studies by Dr. Sulica include collaboration with Bridget T. Carey, MD, Assistant Attending Neurologist at NewYork-Presbyterian/Weill Cornell, to refine the investigation of nerve problems affecting the vocal folds. Their work, which adds a means of quantitatively assessing laryngeal sensation to the existing diagnostic armamentarium, may have special applications for cough, laryngospasm, and subtle nerve dysfunction as well as enhance the ability to predict recovery in vocal fold paralysis.⁴

A significant proportion of patients that Dr. Sulica sees are performing artists: “We are studying their outcomes after they undergo interventions, specifically outcomes regarding their return to performance.” Although performing artists are a highly specialized patient population, Dr. Sulica added that their treatment

successes ultimately would benefit patients in many types of professions as treatment and rehabilitation techniques are optimized for those patients who are the most vocally demanding. “As our society becomes more information-based, communication becomes very essential,” he said. “There is virtually no line of work in which communication has not become key in the information age. Delivering treatment for laryngeal disorders effectively, safely, and efficiently to keep people functioning at their peak is where we've devoted our efforts.”

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