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Salivary Gland Endoscopy Techniques Refined

One of the most recent advances in minimally invasive surgery is salivary endoscopy. Using endoscopic techniques to remove calculi or stones that cause recurrent infections in the salivary and parotid ducts allows surgeons to avoid making external incisions or removing the entire gland. As endoscopic tools improve, the procedure is being applied to the pediatric population.

According to Max M. April, MD, the new techniques represent a tremendous advance. "Stones are the most common reason for performing a sialendoscopy. Some can be taken through the mouth but when a stone is too large or it's stuck more proximal in the duct, in the past the only option was to make an incision in the neck and remove the gland," he said. "Now we can go through the duct with a very small endoscope, and if the stone is not too big we can take it out."

When patients have recurrent swelling of the parotid or the submandibular gland, a computerized axial tomography (CAT) scan is used to identify the source of the problem. If the stone is causing the swelling, a CAT scan can help to locate it within the duct. With the patient under anesthesia, the surgeon inserts a small scope into the duct via the mouth. Once the stone has been found and examined with the scope, a tiny basket is introduced into the duct and used to remove the stone. "Probably 90% or more of these cases are due to stones," Dr. April said, "and the other 10% result from narrowing of the duct, a stricture, or mucous plugging of the duct. Some patients have Sjögren's syndrome and those are also patients that would benefit from endoscopy."

Dr. April mostly treats young patients. "An older person who has recurrent attacks of stone-related problems might be willing to have the whole gland removed, but you would not want to create a scar on a child's neck or remove the gland if you don't have to," he said. Patients benefit from reduced hospital stays, speedy recovery times, and improved quality of life. Dr. April collaborates with otorhinolaryngologists at NewYork-Presbyterian Hospital/Weill Cornell Medical Center who treat these conditions in adults. "We're working with Dr. Ashutosh Kacker and Dr. David I. Kutler [in] performing these procedures. Children's ducts are smaller, so maneuvering the scope and the basket is more difficult. Experience with adults helps to improve our technique, so we can take even better care of our younger patients."

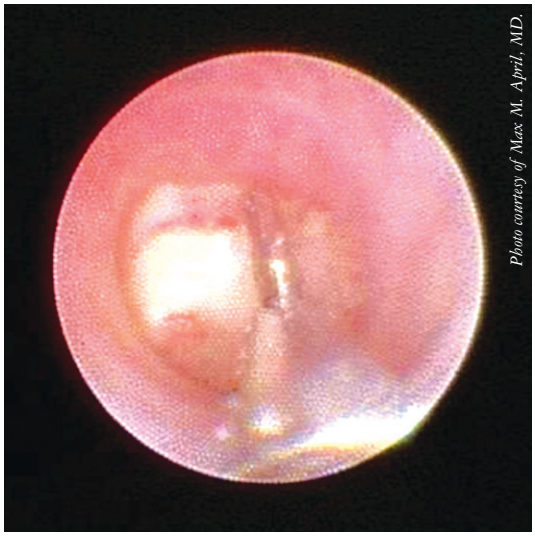
Photo courtesy of Max M. April, MD.
Sialendoscopy performed with forceps to extract stone in submandibular duct.

In addition to common cases of stones in the

see Salivary, page 3

Head and Neck Cancer: ELS Improves Outcomes

Endoscopic procedures conducted through the natural openings of the mouth and throat are increasingly being used to treat head and neck cancers. New techniques, such as endoscopic laser surgery (ELS), allow surgeons to avoid performing tracheotomies and other invasive surgeries. Because many patients undergoing endoscopic procedures are 70 years of age or older, and because younger patients may frequently have concurrent viral infections, the shortened recovery times and reduced hospital stays are seen as extremely beneficial.

According to Salvatore M. Caruana, MD, healing is faster with the endoscopic approach because healthy tissue is not damaged. "There is less injury to the resident blood vessels and muscles and, more importantly, to the nerves in the area. We usually do not need to do a tracheotomy with this kind of

see Head/Neck, page 2

High Marks for Hospital's First Otolaryngology CME Course

More than 120 physicians from across the country packed New York City's W Hotel for the first "Otolaryngology Update in NYC" continuing medical education course, hosted by the Weill Cornell Medical College Department of Otorhinolaryngology this past October. "The course was a terrific success," said Michael G. Stewart, MD, MPH.

The course format consisted of brief talks and panel discussions of intriguing cases covering the entire ear, nose, and throat spectrum, including allergy, voice, otology, rhinology, and pediatric otolaryngology.

"Speakers reviewed the management of common problems, such as hearing loss and allergic rhinitis," said Dr. Stewart, "as well as cutting-edge developments such as biofilms, transnasal skull base surgery, sentinel node biopsy, sleep apnea surgery, new techniques for partial tonsillectomy, and transnasal esophagoscopy, plus new diagnoses like superior semicircular canal dehiscence syndrome."

A total of 31 faculty members participated in presentations, including 16 from Weill Cornell Medical College, 5 from Columbia University College of Physicians and Surgeons, and 10 from other institutions.

Speakers also addressed economic and regulatory issues affecting ENT practitioners. Surgical topics included recent developments in plastic and reconstructive surgery as well as head and neck surgery techniques and challenges.

"Attendees came from far and wide, including Washington state, Florida, Oklahoma, Alabama, and Texas, and they gave the venue and the course excellent ratings," added Dr. Stewart. Building on this success, the 2008 course will be hosted by Columbia University College of Physicians and Surgeons' Department of Otolaryngology–Head and Neck Surgery. It will take place at the New York Athletic Club on Central Park South in New York City, October 16-17, 2008.

"It takes about a year to plan a course this big, so Columbia and Weill Cornell will alternate hosting and organizing," Dr. Stewart explained. The "Otolaryngology Update in NYC" course will continue as an annual event; Weill Cornell's Department of Otorhinolaryngology will host the course again in 2009.

Contributing faculty for this article:
Michael G. Stewart, MD, MPH

continued from Head/Neck, page 1

surgery, which is often necessary for open head and neck cancer resection," he said. "The return to complete swallowing function is faster than with open surgery."

Recent improvements in technology, such as a carbon dioxide (CO_2) laser that can fit through an endoscopic tube, are what make the procedures possible. Dr. Caruana noted that it is important to find an endoscope of the right size. "We have special sets of endoscopes which extend or open to give us room to work," he said. "We pass down whatever instruments we need and actually remove the tumor—instruments for grasping the tumor through the scope, for cauterizing bleeding vessels, and for placing clips across bleeding vessels. We use the CO_2 laser to do all of the cutting. Removal of the tumor is actually done with the CO_2 laser viewed through an operating microscope as we're working."

However, many tumors are too big to pass through the endoscopic tube. In such cases, the surgeon uses the laser to cut the tumor into smaller pieces and then removes them individually. Questions have been raised about this practice, but Dr. Caruana emphasizes the safety of the procedure.

"There's been plenty of experience with this over the years, mostly work done in Germany that has become popular here and elsewhere. It doesn't spread the tumor by cutting through it with the laser," said Dr. Caruana. "That was a big concern in the past, and people are still concerned about it on a theoretical level, but if you look at the data, it's been shown that the local control rates are equal to or better than [those with] traditional open surgery. Just as with the conventional procedure, it's actually an excision of the tumor along with a margin of normal tissue, an oncologically sound thing to do." Research by Wolfgang Steiner, MD, at the University of Göttingen in Germany, and others has spearheaded efforts to refine endoscopic laser surgery techniques (*Eur Arch Otorhinolaryngol* 2007;264[6]:577-585).

Although the size of a tumor does not generally cause problems, its location might. Patient anatomy can be an issue. "Tumors are very often at the bottom of the tongue, or down by the voice box, so access is a major issue, and it sometimes limits whether we can do these operations," Dr. Caruana explained. "Sometimes people have a tumor that's a very good candidate for this surgery, but the shape of the mouth—such as a very high tongue, very large teeth, or an underbite—will limit our ability to get an endoscope in to actually see the tumor. If we cannot visualize the tumor, an endoscopic approach cannot be done."

"We might take the primary tumor out of the throat using an endoscopic technique and then use an external approach to clean out the regional lymph nodes."

—Salvatore M. Caruana, MD

Patients with early- and middle-stage tumors are generally the best candidates for this surgery because they affect a relatively small area and are easier to remove completely. With later-stage cancers, a combined approach may be the best option. "We might take the primary tumor out of the throat using an endoscopic technique and then need an external approach to clean out the regional lymph nodes," Dr. Caruana said. "Sometimes we stage these procedures—we take the primary tumor out first and get final permanent sections on it, which are generally more accurate than the frozen sections that we get in the operating room. When we go to do the neck dissection, if any of the margins have come back positive, we can go back and remove the remaining cancerous tissue while doing the second procedure."

Dr. Caruana suggests that the next technologic advance in head and neck cancer resection will be the introduction of robotic instruments. "Robotic surgery will make it much easier to perform these operations," he said. "Right now they're very labor-intensive."

Ultimately, he approaches patients on a case-by-case basis: "We don't think endoscopy is the answer to every case of head and neck cancer, and we're committed to finding the best course of care for our patients."

Contributing faculty for this article:
Salvatore M. Caruana, MD

Advanced Technology Sheds New Light on Familiar Diagnoses

Although the diagnosis of vocal fold paralysis has been around for decades, as many as 20% of cases have no known cause. It is often difficult to determine a prognosis even when the reason for the paralysis is known. For idiopathic vocal fold paralysis, the task becomes even trickier. New technologies are rapidly changing how clinicians are able to diagnose and treat this condition.

At NewYork-Presbyterian Hospital/Weill Cornell Medical Center, Lucian Sulica, MD, and colleagues are increasingly using laryngeal electromyography (EMG). "Bridget Carey, MD, from the Department of Neurology, has joined our group and is helping with the interpretation of laryngeal EMG, which really adds a depth of expertise to our investigations that we didn't have before. It is helping us uncover causes for idiopathic vocal fold paralysis," said Dr. Sulica.

By measuring the electrical activity in the muscles of the vocal fold, laryngeal EMG helps determine a patient's chance of recovery, which affects the course of treatment. However, Dr. Sulica noted that it's not enough to know that there is electrical activity in the muscle; in some cases, the process of reinnervation can cause further disruptions to the vocal fold and inhibit its function (*Curr Opin Otolaryngol Head Neck Surg* 2007;15[3]:159-162).

"The many small muscles that move the vocal folds have to be very finely controlled. Most vocal folds get some nerve function back after paralysis, but reinnervation can go to the wrong muscles, or it can provide inadequate force," he said. "It can actually even set up a situation where synkinesis may occur. We're trying to determine predictive factors and mechanisms of spontaneous recovery, and we're watching to see how long that recovery takes. We have many ways to treat this problem and we're good at it, but we need to understand how to deploy them."

The data from EMG also make it easier to stratify cases and choose among treatment options, noted Jonathan Aviv, MD. "It does not necessarily precisely guide you, but if you know a vocal cord is not going to come back on its own you're more apt to perform a procedure, injecting a substance into the curved vocal cord to straighten it out," he said. "On the other hand, if there is electrical activity, you might still perform the procedure but

see Voice, page 4

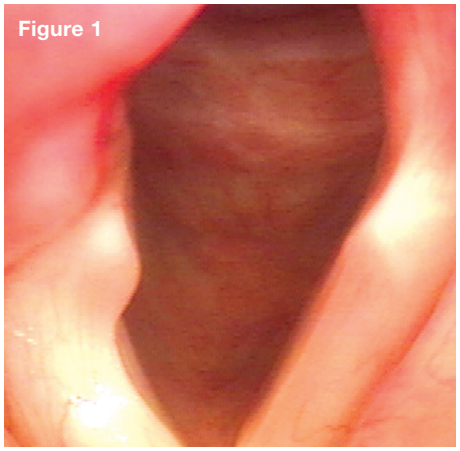

Figure 1. The right vocal fold of a 39-year-old female patient is paralyzed and hypotonic, causing the patient to aspirate liquids and have a profoundly hoarse voice.

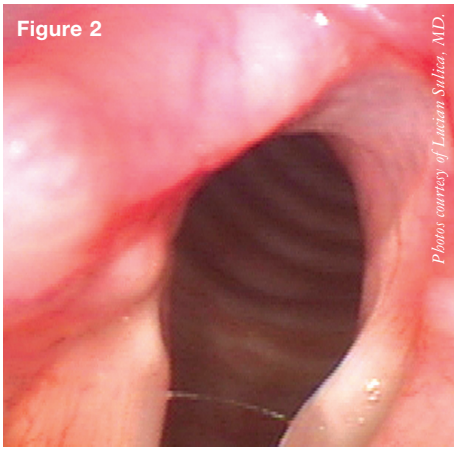

Figure 2. One week after an injection of calcium hydroxylapatite paste to the right vocal fold, the vocal fold remains paralyzed but has good closure and both aspiration and hoarseness have resolved.

continued from Salivary, page 1

salivary and parotid ducts, Dr. April treats the occasional case of recurrent parotitis in children. According to Dr. April, endoscopic techniques have revolutionized treatment. "In the past my only option was to take all of the parotid gland out, which is a very difficult operation," he said. "Not only do you have all the difficulties associated with a parotidectomy with potential facial nerve injury, but it is even harder because all the surrounding tissue has been chronically infected. Now we will be able to do sialendoscopy and hopefully dilate the stricture that is precipitating the recurrent infections."

As new tools become available in the United States, Dr. April will be able to treat more cases endoscopically, particularly cases where a stone is too large or firmly entrenched, making it difficult to remove. "The FDA has to approve techniques and instrumentation that are already used in Europe," he said. "That includes the laser, and newer extraction devices to remove the stones. Currently, we only have the baskets. We are eagerly awaiting the FDA approval for those techniques to be available. It will probably be months rather than years, or at least that's what we're hoping."

In the meantime, Dr. April is working on spreading the word about new endoscopic procedures to other pediatric otorhinolaryngologists. Since recurrent parotitis is uncommon in children, many ear, nose, and throat physicians (ENTs) have never had reasons to explore options for treatment and they may not be sure how to proceed. "This is an unusual clinical entity, and I still only see 1 or 2 patients a year who have it," he said. "ENTs who are not familiar with recurrent parotitis of childhood may just tell parents to give children antibiotics if they don't want to go through with the parotidectomy, and infections recur once or twice a year. We need to increase awareness of recurrent parotitis of childhood and of the options for treating it with sialendoscopy. Hopefully we'll see more patients that we can help with this problem."

Contributing faculty for this article:
Max M. April, MD

continued from Voice, page 3

inject a substance that you know will dissolve in 30 to 60 days or 60 to 90 days—something less permanent than what you would use if you knew the cord was not going to come back on its own."

Dr. Aviv and colleagues at NewYork-Presbyterian Hospital/Columbia University Medical Center have also been using Radiesse FN, a purified bone protein composed of calcium hydroxylapatite. "It is a fairly recent development. The injection itself can often be performed in an office setting, which is also relatively new," said Dr. Aviv.

Dr. Aviv's passion for cutting-edge technology is finding another outlet in improved tools for endoscopy, most notably a tiny digital camera. "We have begun to use a distal chip scope for the larynx and the esophagus," he said. "It's only 3 mm in diameter and the camera is at the tip, so the image is unbelievable. A single-use disposable EndoSheath fits over it so that you can reprocess the scope very quickly without risk of cross-contaminating a patient," he said. Dr. Aviv cited its application not only in the ear, nose and throat, but also in gastroenterology, urology, and obstetrics/gynecology. "We're probably the first to use it in the larynx and for transnasal esophagoscopy," he added.

Previous instruments included a camera in the eyepiece of the scope and a fiber-optic cable. Here the camera is actually at the tip of the scope, and it sends a digital signal. "Now you can see as well as you can with a rigid-end scope," Dr. Aviv said. "This is going to change the way we practice because we're going to be able to do things with much less topical anesthesia and much less discomfort to the patient. We're going to be able to see things we hadn't seen before—lesions, tumors, and cancer—in a much safer way. The implications are groundbreaking."

Contributing faculty for this article:
Jonathan Aviv, MD, and Lucian Sulica, MD

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The following is a list of the doctors quoted in this issue of the *NewYork-Presbyterian Hospital Ear, Nose, & Throat* Newsletter. For more information on their work, please contact them at the e-mail addresses listed.

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