

HeadWay

NEWS FOR PHYSICIANS FROM JOHNS HOPKINS
 OTOLARYNGOLOGY-HEAD AND NECK SURGERY

Collaborations lead to innovations

After finishing his head and neck surgery fellowship at The Johns Hopkins Hospital in 2001, **Ralph Tufano** decided to stay and join the Head and Neck division, even though they were then performing only a handful of thyroid and parathyroid operations. “I felt like I could really be part of a growing area,” he says, “and make a difference.”

Last year, Tufano, now director of thyroid and parathyroid surgery, and his colleagues performed more than 250 thyroid- and parathyroid-related procedures, an expansive growth he attributes to Johns Hopkins’ interdisciplinary approach. Although endocrinology, general surgery, and otolaryngology-head and neck surgery are separate at many hospitals, physicians from these specialties collaborate here to make sure patients get the best care.

Such close teamwork allows them to develop the best plan to tackle especially difficult procedures, such as reoperations when cancer recurs. These surgeries can be incredibly complex, involving navigation around scar tissue from previous surgery. Tufano notes that the ability of the various specialist teams to pool their expertise is a draw for many cancer patients who need follow-up surgery. “We probably do more reoperative procedures than any other place in the country,” he says.

The close collaboration also



The thyroid and parathyroid surgery team is performing transaxillary operations that leave no scar on patients’ necks.

allows Johns Hopkins’ thyroid and parathyroid surgeons to offer some unique options to patients here. Recently, head and neck surgeons including **Jeremy Richmon** and colleagues in the Department of Surgery began performing transaxillary thyroidectomies and parathyroidectomies, with incisions through a patient’s armpit instead of the traditional approach through the neck, which leaves a scar.

“We see the majority of

thyroid problems in younger women,” Richmon says, “but sometimes those who are advised to have surgery are really reluctant to follow through because they know they’ll have a visible neck scar.”

The procedure involves inserting into a single armpit incision an endoscope with two cameras, along with three robotic arms for grasping, dissecting and cutting. Functional outcomes for this type of surgery have been shown to

CLOSE TEAMWORK ALLOWS JOHNS HOPKINS PHYSICIANS TO TACKLE ESPECIALLY DIFFICULT PROCEDURES.

be the same as those of an open procedure for selected cases.

Richmon anticipates that it’s just a stepping stone to more innovative “scarless” thyroidectomies and parathyroidectomies. He and Tufano have successfully tested another procedure in cadavers in which they make an incision through the floor of the mouth to insert instruments just behind a patient’s teeth. They now hope to offer this option to patients in the next two years.

Meanwhile, Tufano and his colleagues are working on identifying a series of biomarkers that can predict a thyroid cancer patient’s prognosis. Those with a more favorable prognosis may qualify for less aggressive surgery or even avoid surgery altogether.

With thyroid cancers on the rise, Tufano notes that such innovations have never been more necessary.

“We’re excited to develop these ideas,” he says, “and get new treatments out to patients with thyroid and parathyroid disease.” ■

To refer a patient, call 410-955-3628.

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An Eye-Opening New Surgery



Kofi Boahene and his colleagues are accessing a new window to the brain through patients' eyelids.

When **Kofi Boahene** met a 15-month-old child who needed a biopsy on a skull-base tumor, he knew there had to be a better way other than the traditional method.

The standard way to access the base of the brain has been the same for decades: Make an incision from ear to ear, remove bone, lift the brain and head for the skull base. Some minimally invasive techniques that take advantage of natural orifices such as the nose have helped to reduce patients' scars and speed healing. However, these newer techniques aren't an option for every patient, including this toddler.

Boahene, a facial plastic and reconstructive surgeon, and his colleagues came up with a novel idea: Why not reach the brain through the eyelid?

The surgeons developed a plan that involved making an incision on the natural crease of the eyelid. Boahene and his colleagues went through that incision, removed bone above the brow and were able to easily access the tumor at the child's skull base. "It was a nice surprise to find how much exposure you could get through the eyelid, even in such a tiny child," he says.

That initial surgery was a success. Since then, Boahene and his team have performed several other operations through the eyelid to obtain specimens for biopsies, to remove sinus and brain tumors, or to fix cerebrospinal fluid leaks.

This new technique comes with a host of advantages, he says. For example, in patients who have had the traditional surgery multiple times, the eyelid approach offers a new way to access the same area without going through scar tissue. It's also useful for reaching tumors that are away from the midline, an area that is often inaccessible in surgeries that go through the nose. It is also particularly useful for removing the brain portion of sinus tumors that grow cross the skull base. Additionally, the new technique shortens patients' hospital stays, often to three days or fewer, depending on their pathology.

But the benefit that often matters the most to patients is the lack of a visible scar. Just before the surgery takes place, Boahene uses a marking pen to plot out where the incision will be. "The goal is that we won't see the marker when the patient's eyes are open," he says. If the marker isn't visible, he explains, the scar won't be visible either.

Although the procedure has mostly been used for smaller lesions or cerebrospinal fluid leaks in the anterior or midline, Boahene and his team soon expect to use it for larger tumors, aneurysms and other concerns. They also plan to incorporate the surgical robot into their technique. "We are really pushing the envelope with this," Boahene says. ■

To refer a patient, call 410-502-2145.

Feeling Whole Again

The wounds from head and neck cancers aren't just physical—they can be deeply emotional as well, especially for patients who require ablative surgery.

"It's a huge psychic blow for patients who need to have a significant portion of their face removed to save their lives," says dentist **Marvin (Max) Baer**.

Baer, whose aesthetic appreciation and love of working with his hands led him to a career in dentistry decades ago, designs maxillofacial prosthetic appliances that fit inside patients' mouths, filling in holes in their palates and jaws and replacing missing teeth.

Before surgery takes place, Baer and his team model a patient's mouth to develop a temporary prosthesis that will feel comfortable and familiar to the patient and can be placed right away after surgery. They often accompany surgeons into the operating room to better tailor the prosthesis while surgery is under way. This initial device

mainly closes any new defect in a patient's hard palate.

Once Baer and his colleagues know the surgery's outcome, including how much of the hard palate and jaw and how many teeth were lost, they design an intermediate prosthesis complete with teeth which is delivered 10 to 14 days after surgery. Six months to a year later, the patient receives a final prosthesis that takes into account any tissue changes that occurred with radiation, further treatment or healing.

Baer explains that without a prosthesis in place, a defect in the hard palate can make everyday living a struggle. "Patients can't eat or drink, and their speech can be completely unintelligible," he says. "There can be a huge



Marvin (Max) Baer helps restore the image and self-identity patients sometimes lose when necessary cancer treatments change the way they look.

stigma that comes from feeling disfigured. A prosthesis can significantly increase quality of life for these patients."

Expertise like Baer's is relatively rare—there are only around 200 maxillofacial prosthodontists in the United States.

Baer says the high volume of patients he and his colleague see at Johns Hopkins have given him and his team a unique knowledge base and versatility to create devices that fill a patient's needs, both physically and emotionally.

"It's very rewarding," he says, "to know that we can provide that psychological lift to patients and help them feel whole again." ■

To refer a patient, call 410-955-6663.

Sara Pai and her colleagues at the multidisciplinary HPV clinic for head and neck cancers believe that a team approach is the best way to treat these conditions.



Treating Head and Neck Cancers with Multi-D

When the 64-year-old found a couple of lumps on his neck while shaving, he knew that he needed to have them checked out. But the diagnosis of squamous cell carcinoma with no identified primary tumor was a surprise. He didn't drink or smoke, the two biggest traditional risk factors for head and neck cancer. But further investigation identified the primary site of his cancer to be in the base of his tongue, as well as the cause: human papilloma virus (HPV), a culprit long known to trigger cervical cancer in women but now identified as a growing cause of head and neck cancers in both women and men.

Patients diagnosed with HPV-associated head and neck malignancies do not fit the typical profile of head and neck cancer patients, says otolaryngologist and head and neck surgeon **Sara Pai**, who recently launched a multidisciplinary clinic at Johns Hopkins focused solely on treating patients with HPV-related disease. Like the 64-year-old patient, they often don't drink or smoke. While most of the traditional head and neck cancers strike people over 50, HPV-associated head and neck cancers often occur at a significantly younger age, sometimes affecting adults in their early 20s.

The good news, says Pai, is that HPV-associated head and neck cancers often

respond well to treatment and tend to have a better prognosis as compared to non-HPV-related head and neck cancers. Since these cancers respond so well to traditional treatments, physicians are evaluating whether patients can afford to receive lower doses of chemotherapy and radiation in order to minimize the side effects of these treatments while maintaining their good outcomes.

"Because these patients are younger when they're diagnosed and their cancers respond so well to treatment, treating them less aggressively can help them avoid potential lifelong side effects such as problems swallowing, dry mouth and tooth decay," says Pai. "Our goal is to maintain their quality of life."

Pai and a team of colleagues, including other head and neck surgeons, medical oncologists, radiation oncologists and speech language pathologists, meet each patient

PATIENTS DIAGNOSED WITH HPV-ASSOCIATED HEAD AND NECK MALIGNANCIES DO NOT FIT THE TYPICAL PROFILE OF HEAD AND NECK CANCER PATIENTS.

as a group to review their medical history, perform a physical examination and develop a plan for treatment—all in the same clinic visit.

"At this one clinical visit, the patient meets all the subspecialists, and we review all potential therapeutic options, which allows us to formulate a patient-specific treatment plan," Pai says.

The comprehensive care continues while treatment is ongoing. For example, the speech language pathologist provides long-term monitoring to catch any problems with swallowing before they progress. The clinic also provides counseling to help patients deal with emotional or social issues related to their diagnosis, such as potential social stigmas or how the virus might affect their partners.

After the 64-year-old patient visited Pai's multidisciplinary HPV clinic, her team developed a treatment plan based on his less aggressive cancer type and expected a good prognosis: several months of radiation, but no surgery or chemotherapy. He recently concluded his treatment and is waiting for his next checkup in a few weeks—feeling good and anticipating a healthy life ahead. ■

To refer a patient or learn more, call 410-955-2309 or visit hopkinshpv.org.

Blazing a new pathway to hearing

Traditional hearing aids have been a godsend for many people with hearing loss, transforming how they experience the world of sound. But what if a traditional hearing aid isn't the best fit, or isn't even possible for a patient to use? According to otologist **C. Matthew Stewart**, the answer may lie in bone-anchored hearing aids.

These unique devices have been Stewart's longstanding focus ever since he arrived at The Johns Hopkins Hospital for his residency in 2003. He recently brought his expertise to Johns Hopkins Bayview Medical Center, where he not only provides the usual range of otology services, such as surgically managing intracranial tumors that affect hearing or treating cholesteatoma and chronic ear disease, but also evaluation and surgical placement of these osteointegrated hearing aids.

Some of the patients who come to Stewart for these devices have conductive hearing loss, with conditions including arthritis that have affected the stapes or birth defects that leave them without ears or ear canals. Others have mixed hearing loss involving deficits in both conduction and nerve function. A third category of potential users has single-sided deafness, hearing loss that leaves them profoundly unable to experience sound from one side of their body.

The osteointegrated hearing devices take advantage of sound's ability to travel through the skull, explains Stewart. A surgically implanted titanium post holds a sound processor that sends signals through the

skull to the inner ear, enabling hearing.

While it's clear that these devices work for the thousands of users who now wear them, what isn't apparent is why they work so well, Stewart notes. Experimental evidence suggests that people with a bone-anchored hearing device can hear better when sound goes through the bone even if they have nerve hearing loss. Additionally, people with one-sided deafness who wear these devices are often able to locate the source of sounds better than auditory physiology research predicts. "It's a complete mystery to us why and how these devices deliver sounds so clearly to listeners," Stewart says.

To better understand these devices, which could lead to better osteointegrated hearing aids and optimize methods for patient rehabilitation in the future, Stewart is collaborating with **Brad May** and his colleagues at May's world-class Neural Encoding Lab facilities at Johns Hopkins to investigate what elements of speech allow osteointegrated hearing aid wearers to distinguish sounds from background noise or pull out one speaker's voice from a multitude.

In these studies, volunteers who wear bone-anchored hearing aids and people with

OSTEOINTEGRATED HEARING DEVICES TAKE ADVANTAGE OF SOUND'S ABILITY TO TRAVEL THROUGH THE SKULL.



C. Matthew Stewart says that bone-anchored hearing aids, which conduct sound through the skull, can help a variety of patients in which traditional hearing aids have failed.

normal hearing sit in a sound booth and listen to recorded voices that guide the listener through tasks. The voices vary in pitch, tone, volume and direction, which give Stewart's team some clues about which of these elements holds the highest importance for helping hearing aid users understand speech.

This combined research and care approach, says Stewart, will provide bone-anchored hearing aid patients the best options for treatment now and in the future: "We're not just an implant institute." ■

To refer a patient, call 410-955-3492.

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