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Issue Highlights

These articles have been selected by the Coordinating Editor as Key Reviews.

Critical Discussion and Commentary

How Successful Is Lumbar Drainage for CSF Leak After Lateral Skull Base Surgery?

In this series, the rate of cerebrospinal fluid resolution with lumbar drainage alone after lateral skull base surgery was 76%

By Benjamin T. Crane, MD
Based on: Allen KP, Isaacson B, et al. Lumbar Subarachnoid Drainage in Cerebrospinal Fluid Leaks After Lateral Skull Base Surgery. *Otol Neurotol* 2011; 32 (December): 1522–1524.

One of the most common complications of vestibular schwannoma surgery is the postoperative cerebrospinal fluid (CSF) leak. As surgeons, we have a couple of management options — either place a lumbar drain and wait for the leak to resolve or return to the operating room and hopefully find the leak, which can then be repaired. Each of these options has potential advantages as well as pitfalls. Placing a drain has the advantage of potentially avoiding a take-back surgery, but if it is not successful, it also wastes valuable time. Going with surgery early also risks the potential of any unnecessary operation. Which of these operations should we choose? A recent article addresses this question.

The rates of CSF leak after lateral skull base surgery have been reported over a wide range, from 0–35%, but most people believe the true figure is probably close to 10%. These leaks can present in several ways — leakage from the wound, otorrhea or rhinorrhea. Wound leaks are frequently managed by oversewing the incision. Other conservative options include bedrest and raising the head of the bed. Lumbar drainage is also an option and has a published success rate of 57–90%. The current study retrospectively reviewed CSF leaks after lateral skull base surgery at the authors' institution. This study reviewed the cases of lateral skull base surgery between July 1999 and February 2010. The diagnosis of a CSF leak in these patients was based on clinical criteria. The protocol followed was the following: CSF rhinorrhea and otorrhea were first treated with bedrest and head elevation, pressure drainage and lumbar drainage. Wound leaks were initially managed with oversewing and then a pressure dressing. Patients had reoperation if it was felt the lumbar drain was not effective.

> The most common reason for surgery was vestibular schwannoma resection, which was 62% of those who had a CSF leak.

There were a total of 508 lateral skull base surgeries during the study period; of these, 12.6% developed a CSF leak that required a lumbar drain. Of the patients who developed a leak, the most common approach was the translabyrinthine, which was used in about half of the cases. The other cases included middle fossa approaches and transpetrosals as well as others. The most common reason for surgery was vestibular schwannoma resection, which was 62% of those who had a CSF leak. The CSF leak was diagnosed on average at postop day five, although the range was from the day of surgery until 28 days later. Lumbar drainage was on average used for 4.6 days with a maximum of seven days. The length of hospitalization for those that received the lumbar drain was 11.9 days. The drainage was successful in 76% with a remaining 24% going on to repair. Lumbar drainage was 90% successful in patients undergoing a translabyrinthine approach, but only 50% successful in the suboccipital approach. This difference was significant, P =0.04. Minor complications of drainage included headaches in 29% and nausea and vomiting in 22%. There were also some incidents of catheters becoming accidently dislodged.

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Two major complications were observed. One patient had a retained catheter tip which required a laminectomy to remove. A second patient experienced uncontrolled drainage which resulted in unconsciousness, but the patient eventually recovered. Five patients had a second lumbar drain placed after the first lumbar drain was unsuccessful. All of these patients eventually required reoperation. Six patients developed meningitis with an average time to onset of 18 days. Five of these patients went on to surgical repair of their drainage, but there were no mortalities. The rate of success with lumbar drainage in this series, 76%, is in line with that reported by others. One interesting finding is that the rate of leak control with lumbar drain placement was significantly worse if the initial surgery was a suboccipital approach. Although some recommended lumbar drainage only if the leak was found in the first two days after surgery, in this series there was no significant trend between the success of the drain and the time it was placed.

This series demonstrates that CSF leak is controlled in about 76% with a lumbar drain. The authors do not offer an explanation why the rate of success was lower with the suboccipital approach cases. With this approach, it is possible to have the drainage to occur from either the cells exposed in the internal auditory canal or from air cells exposed in the craniotomy. The authors do not disclose the location of these leaks, which may have given some hints on how they might be prevented or why they were not amenable to lumbar drainage in the first place.

Can AM-111 Restore Hearing?

In gerbils, AM-111 demonstrated a benefit for preserving hair cells and maintaining hearing after cochlear ischemia

By Benjamin T. Crane, MD
Based on: Omotehara Y, Hakuba N, et al. Protection Against Ischemic Cochlear Damage by Intratympanic Administration of AM-111. *Otol Neurotol* 2011; 32 (December): 1422–1427.

Hearing loss is a major problem in most of our practices and something most of us will experience if we live long enough. Hearing aid technology has improved a lot in the last decade, and other technologies offer the promise of hearing restoration such as cochlear implants and bone anchor devices. Sometimes patients with progressive hearing loss ask me if there are any medical treatments available and often mention a magazine article or something they found on the Internet about stem cells or some potential future cure. Although steroids have shown to be very helpful in cases of sudden sensory neural hearing loss, not all cases are responsive to steroids and there is still no medication available shown to have a benefit in restoring hearing loss or preventing future hearing loss other than steroids. A recent paper reports some promising results.

In most cases of hearing loss, the underlying cause is uncertain, but cochlear ischemia has been implicated especially in cases of idiopathic sensory neural hearing loss. There is an

animal model of ischemia to the cochlea, which is known to cause high-frequency hearing loss. AM-111 is a peptide known to inhibit the c-Jun N-terminal kinase (JNK) signaling pathway, which is part of apoptosis. This drug can also penetrate through the round window membrane, so it can be delivered in a manner similar to transtympanic steroids.

The current study presents an animal model to see if AM-111 can prevent ischemic damage to the cochlea after it is applied to the round window. This study uses adult Mongolian gerbils. These animals had cochlear ischemia induced by obstructing the vertebral arteries in the neck for 15 minutes. After this, the arteries were reperfused. In 18 animals, six in each of three concentrations, AM-111 was applied to the round window membrane for 30 minutes. In six control animals, just gel with no active substance was placed against the round window membrane. Auditory brainstem responses (ABRs) were recorded prior to the ischemia, four days afterwards and again seven days afterwards. The animals were sacrificed on day seven after the ABR was recorded. Afterwards, the number and fraction of dead hair cells were determined in each animal. The transient ischemia caused hearing loss immediately afterwards, which usually recovered slightly over time in these animals. Recovery of hearing was much better, however, in animals given AM-111; in these animals, the responses were concentration dependent, although hearing preservation was almost complete in animals given 100-μM concentrations. There was a statistically significant improvement relative to controls in all concentrations even the lowest 1-μM concentration. In control animals, 13% of inner hair cells were lost to the basal turn on day seven, and the number of outer hair cells lost was 4.2%. The basal turn was the most affected area of the cochlea as expected from prior studies on ischemia. In animals given 100-μM concentrations of AM-111, the inner hair cell loss was limited to 3.1%. At lower concentrations of AM-111, the hair cell preservation effect was not as dramatic. Prior studies on AM-111 have demonstrated that it prevents neomycin toxicity, damage due to acoustic trauma and labrynthitis. There are some data to suggest that this agent could prevent ischemic brain injury.

This study demonstrates that AM-111 had an effect both at preserving inner hair cells and hearing after ischemic damage. This medication has also undergone Phase I and II clinical trials in Germany on patients 24 hours after acoustic trauma with some hearing improvement in a limited population of patients. There is currently a much larger Phase II trial of AM-111 taking place in several European nations to study the potential benefit in patients with idiopathic sudden sensory neural hearing loss. The results of this larger trial are not available.

To me, this study is very exciting because it documents the potential benefit of a truly new treatment for the relatively common problem of idiopathic sudden sensory neural hearing loss. Although we currently treat these patients with steroids, there are many patients who do not get a response from steroids. This paper demonstrates that there may be another treatment on the horizon. Of course, we cannot say from the results presented here if this treatment will be better than steroids in humans or if it will offer any additional benefit at all. I will keep my eye out for further human trials of this medication.

High Mortality Rate for Individuals Undergoing Tracheotomy

High mortality rate after tracheotomy appears to be more related to underlying illness than complications of the procedure

By Heather Starmer, MA, CCC-SLP
Based on: Shah RK, Lander L, et al. Tracheotomy Outcomes and Complications: A National Perspective. *Laryngoscope* 2012; 122 (January): 25–29.

Tracheotomy may be employed for a variety of reasons including prolonged mechanical ventilation, pulmonary toileting and bypassing an obstructed airway. The value of this procedure for life-sustaining treatments is well-established. Conversion from endotracheal intubation to tracheotomy can facilitate ventilator weaning, verbal communication, initiation of oral diet and reduction of complications such as ventilator-associated pneumonia. Despite these advantages, complications attributed to tracheotomy and mortality in individuals undergoing tracheotomy are important factors for consideration. Methodological challenges such as limited institutional numbers and reporting bias make determination of these risks difficult at the single institution level. As a result, the authors sought to evaluate complications and mortality associated with tracheotomy at the national level using the Health Care Cost and Utilization Project's National Inpatient Sample Database.

The National Inpatient Sample is the largest publicly available inpatient database including eight million inpatient admissions over 1,000 hospitals in 38 states. Included in analysis were individuals over 18 years of age undergoing tracheotomy in the United States in 2006. Both temporary and permanent tracheotomy codes were used for patient selection. Primary outcome variables were in-hospital mortality and tracheotomy-related complications. Complication codes included tracheostomy infection, mechanical complication including tracheal stenosis, and other complications such as tracheoesophageal fistula or tracheal hemorrhage. Analysis included patient demographics and medical conditions, hospital characteristics and geographic location.

A total of 113,653 tracheotomies were captured during 2006. Most tracheotomies were performed in urban hospitals, in teaching hospitals and in hospitals in the South. The average patient age at admission was 61 years. The majority of patients had public insurance. The three most common reasons for tracheotomy were COPD, CHF and pneumonia; 19.2% of patients died during the admission in which tracheotomy was performed. Risk factors for mortality included hospitals in the Northeast, nonteaching hospitals, age greater than 50 years, non-routine hospital admission and underlying cardiac conditions. Advanced age was found to be most associated with mortality risk. Tracheotomy complications were reported in 3.2% of subjects. Prevalence of tracheotomy-related complications did not correlate with age, race or insurance type. Complication rate was higher in nonteaching hospitals, in Western hospitals and in patients with upper respiratory infections, obesity, paralysis and CHF.

Based upon their findings, though tracheotomy-related complications are relatively uncommon, in-hospital mortality rates are high in individuals undergoing tracheotomy, suggesting the need for consideration of rationale behind performing tracheotomy in selected at risk patients.

The current study is attractive in its ability to consider a large sample of patients across the country in order to gain a better understanding of the factors associated with complications and mortality after tracheotomy. The finding that mortality after tracheotomy significantly outweighs general complication rates suggests that mortality after tracheotomy is more likely related to underlying illness and patient factors than to the tracheotomy itself. The finding that older, sicker individuals are at greater risk for death also supports this. This suggests that the rationale for tracheotomy in the most at-risk patients needs to be well-understood, and these risks need to be discussed candidly with patients and their families prior to tracheotomy.

Lack of Standardization in Post-Tracheotomy Care

Variability in post-tracheotomy care suggests the need for clinical practice guidelines

By Heather Starmer, MA, CCC-SLP
Based on: Zhu H, Das P, et al. Surveillance and Management Practices in Tracheotomy Patients. *Laryngoscope* 2012; 122 (January): 46–50.

A recent paper was published alongside a companion paper regarding post-tracheotomy catastrophic complications. The authors disseminated a survey to the AAO-HNS members regarding post-tracheotomy care and complications. In this paper, they reported the findings regarding postoperative care and surveillance. The purpose of this paper was to explore post-tracheotomy surveillance and management practices at the national level. An online survey was disseminated to 10,000 members of the AAO-HNS. Respondents were asked to describe their post-tracheotomy surveillance practice, decannulation algorithms, comfort with current practices, and perceived benefit of developing a clinical practice guideline. Responses were classified into temporal categories according to recency of surgery including immediate postoperative care, intermediate and long-term care.

Respondents included 478 members of the American Academy of Otolaryngology — Head and Neck Surgery with a mean number of years in practice including residency of 21.2 years. Approximately two-thirds of respondents reported performing primarily adult tracheotomy. Fifty-five percent of respondents reported providing care for individuals having catastrophic events after tracheotomy. On average, respondents followed patients daily for the first week following tracheotomy. However, standard deviation was 2.6 days with a range from six hours to 10.5 days. In respect to intermediate follow-up, the median frequency of follow-up was every month for three months with reports ranging from every one week to six months. Long-term follow-up occurred on average every four months, but reports ranged from one to 24 months. Approximately one-third of respondents reported altering surveillance on an as-needed basis. The majority of surveillance was reported to be completed during trach tube changes with endoscopy employed approximately 60% of the time. Mean frequency of trach tube change was two months, with values ranging from 0.06 to 12 months. Of the 94% of respondents who reported performing decannulation, 77% followed a decannulation algorithm. The majority of respondents reported comfort with their own clinical management practices but also saw the value of developing clinical practice guidelines.

In conclusion, the authors acknowledge significant variability regarding reports of post-tracheotomy surveillance and management. They suggest that clinical practice guidelines may help to standardize care in this patient population. In the accompanying article by Das, et al regarding catastrophic events following tracheotomy, the majority of serious events happened after the immediate postoperative state, with many events occurring in long-term care or home environments. This finding suggested the need for improved education and care of patients with intermediate and long-term tracheotomy. In this series, there was wide variation in care patterns following tracheotomy. Lack of basic standardization of care may lead to increased confusion between caregivers and therefore greater risk for complications. Further, lack of standard clinical practice may allow payers to define appropriate frequency of trach changes. The authors cite that respondents reported insurance constraints on frequency of trach change. Ideally, evidence-based clinical practice guidelines should guide insurance coverage indicating further support for the need of clinical practice guidelines for post-tracheotomy care. Finally, development of clinical practice guidelines may support facilitation of coordinated care between the disciplines providing post-tracheotomy care including respiratory therapists, nursing staff, pulmonary specialists and speech pathologists.

A Review of Sclerotherapy for Lymphangiomas

OK-432, doxycycline, ethanol, bleomycin and others have been used to successfully treat all forms of lymphangiomas of the head and neck

By Young J. Kim, MD
Based on: Wiegand S, Eivazi B, et al. Sclerotherapy of Lymphangiomas of the Head and Neck. *Head Neck* 2011; 33 (November): 1649–1655.

Lymphangiomas are clinical entities that are difficult to manage. Historically, lymphangiomas were histologically classified at capillary, cavernous and cystic. However, more recently this classification has been replaced by gross morphologic categories. They are now classified as macrocystic, microcystic or mixed. They can present frequently in the pediatric population, but their treatment plan is complicated by its appearance in the head and neck region with its proximity to vital structures. Surgical resection is the mainstay

for definitive treatment, but the decision for resection should always be negotiated with comorbidities of surgery and the potential for recurrences. In this context, sclerotherapy has been successfully used as an alternative. However, there are multiple sclerotherapies available on the market worldwide. The authors of a recent report, therefore, reviewed and summarized the current literature on the various sclerosants that have been used for lymphangiomas of the head and neck region. The sclerosants that have been used are OK-432, doxycycline, ethanol, Ethibloc and many others, and this reviewer reviews the literature for each of these.

OK-432 is a lyophilized material from group 1 *Streptococcus pyogenes*, which were initially developed as an immunomodulator for cancer patients. OK-432 is used at 0.01 mg/mL to a max volume of 20 mL. The success rate ranged from 76–96% in the various series that have been reported in literature. There is more evidence of success for macrocystic lymphangiomas, but there are no clear randomized clinical trials to corroborate this. The therapeutic response occurs over six weeks, and there is an intense inflammatory response associated with localized edema, pain, erythema and fever. There has been an isolated airway distress for hemangiomas treated near the airways, so airways should be monitored for these patients treated with OK-432. OK-432 is still not approved by the FDA for lymphangiomas in the United States.

The other sclerosant that the authors review in this paper is doxycycline. Doxycycline has also shown to be effective for lymphangioma, but in this case this drug may be more effective for microcystic disease. There have been a handful of studies to corroborate these findings. The downside of using doxycycline is the severe pain associated with the injections, such that general anesthesia may be necessary, particularly in the pediatric population. The concentration used is 5–20 mg/mL and around 20–100 mL is used. No airway compromise has been reported for doxycycline use, but localized nerve injury has been noted.

Ethanol has also been used worldwide with comparable success. However, ethanol appears to have a worse side effect profile, particularly with nearby motor nerves. Facial paralysis with ethanol use has been well-documented in the literature. Furthermore, there is a systemic effect with ethanol injections such that its use in the pediatric population may not be feasible at times.

Bleomycin has also been documented for lymphangiomas. There have been several reports of success in reducing the lymphangiomas, but this medication was initially developed for chemotherapy for malignancies and its potential cytotoxicity profile consists of transient hair loss and pulmonary fibrosis. In this review, the authors also list other sclerosants such as Ethibloc, STS, acetic acid and others, but these have not been studied in significant details to warrant extensive discussion.

Overall, there are still promising sclerosant agents for lymphangiomas, but there are no conclusive Level 1 evidence-based studies for any of these sclerosants described above. All of these agents are used as off label. There have been no true controlled prospective studies to validate their use formally. However, it should be noted that some of these agents are being used in centers throughout the United States. This was a very good review on this topic, and I recommend getting a copy of this to get Table 1 to use as a reference in the future.

Wegener Subglottic Stenosis Can Be Surgically Repaired

Open surgical reconstruction of Wegener subglottic stenosis is not associated with higher rate of failures

By Young J. Kim, MD
Based on: Wester JL, Clayburgh DR, et.al. Airway Reconstruction in Wegener's Granulomatosis-Associated Laryngotracheal Stenosis. *Laryngoscope* 2011; 121 (December): 2566–2571.

Subglottic stenosis is a difficult problem seen among Wegener's granulomatosis patients. Given its autoimmune nature, many have recommended non-resection methods to treat this disease with the assumption that the stenosis will recur. However, there are no clear data whether open cricotracheal resection in Wegener's patients have higher rates of complications or recurrences. Therefore, the authors of a recent paper reviewed their series of laryngotracheal resection and cricotracheal resection at a single institution. The authors reviewed a 15-year review of open airway reconstruction with a particular attention to Wegener's patients. In this series, they reviewed 53 total patients, but they found only eight patients with Wegener's disease who underwent open reconstruction. They had a mean follow-up of eight years for Wegener's patients and under two years for non-Wegener's patients. In this series, open reconstructions were defined as laryngotracheoplasty or cricotracheal resection. Laryngotracheoplasty (LTP) was performed with or without cartilage grafts, and stents were placed for four to six weeks with a tracheostomy in place. For those with Wegener's, only those with quiescent autoimmune disease were included. About half the patients were tracheostomy dependent prior to the resection or reconstruction. Failure and complication rates were measured in this series.

The overall success rate for open airway reconstruction in Wegener's patients was comparable to success rate of nonautoimmune disease patients. Decannulation rate was the same between the two groups. About 75% of the Wegener's patients were decannulated, and the number was comparable for the non-Wegener's patients. One significant caveat, however, was that the Wegener's patients required more trips to the operating room after the reconstruction for more dilations. This was statistically significant. However, it was unclear what this number meant because the follow-up times between the two groups were different. The Wegener's patients were followed up for more than five years, while the non-Wegener's group had a mean follow-up time of less than two years.

There are some interesting findings in this report. The authors compare open reconstruction in Wegener's group versus non-Wegener's group. Globally, it appears that open reconstruction may not have the high failure rate as expected. The decannulation rate of 75% is impressive, but remember only four patients are tracheostomy dependent in this series prior to the reconstruction, so this number is hard to judge. Note also that this study only follows eight Wegener's patients. They also demonstrate that Wegener's

patients have a higher number of subsequent dilations after the open reconstruction. However, they are followed for a longer period of time, so once again it is hard to judge what these numbers mean. There is heterogeneity in the two comparison groups as well. The Wegener's patients tend to have a cotton grade of 2, while the non-Wegener's group had a higher number of cotton grade of 3. However, despite these limitations, another way to judge this paper is the lack of significant disparity in the success rate of the two groups studied. The Wegener's patients did well with open reconstruction as well as those with nonautoimmune disease. This should be a good report to cite to justify open reconstruction of Wegener's subglottic stenosis.

reviews

Literature Reviews

Pediatric Tracheal & Endobronchial Tumors — Rare But Dangerous

Take Home Pearl:
Pediatric endotracheal and endobronchial tumors are likely to be malignant, with carcinoid and mucoepidermoid carcinoma being most common.

Background: Pediatric endotracheal and endobronchial tumors are rare, but the pathology of these tumors can represent a wide variety of processes. These tumors can be diagnosed using direct laryngoscopy and bronchoscopy and should be considered in the differential diagnoses in the right clinical context.

Objective: To describe the pathologic findings, clinical presentation, and treatment for pediatric endotracheal and endobronchial tumors.

Design/Methods: This was a retrospective review of 14 patients with endotracheal and endobronchial tumors at a tertiary care children's hospital. Patients were included in the study if endoscopy was performed to yield biopsy specimen.

Results: Patients ranged in age from 4 to 18 years and were treated between 1993 and 2009. Recurrent pneumonia was the most common presenting symptom (n=6), followed by wheezing or asthma unresponsive to medical treatment (n=4). A majority of the lesions (n=9, 64%) were malignant, with the rest being benign lesions. Among the malignant tumors, carcinoid was the most common pathology (n=5, 55%) followed by mucoepidermoid carcinoma (n=3, 33%) and 1 adenoid cystic carcinoma. The benign lesions included histoplasmosis nodules, chondroid hamartoma, pulmonary chondroma, and inflammatory myofibroblastic tumor. Surgical resection was carried out in 12 patients, with 3 of these cases requiring adjuvant chemoradiation therapy. Extent of surgery ranged from lobectomy to sleeve resection to pneumonectomy.

Conclusions: Pediatric endotracheal and endobronchial tumors are likely to be malignant in nature. Such tumors should be included in the diagnostic consideration of patients with recurrent pneumonias or chronic wheezing not responsive to medical therapy.

Reviewer's Comments: There is a relative scarcity of literature regarding pediatric endotracheal and endobronchial tumors given their rarity. Chest x-ray is generally performed first, and based on the findings either rigid bronchoscopy or CT may be recommended. Rigid bronchoscopy continues to play an important role in completing the pulmonary evaluation and obtaining adequate biopsy specimen.

Reviewer: Tang Ho, MD
Article Reviewed: Roby BB, Drehner D, Sidman JD. Pediatric Tracheal and Endobronchial Tumors: An Institutional Experience. *Arch Otolaryngol Head Neck Surg* 2011; 137 (September): 925–929.

Brief Tinnitus Episodes Are Extremely Common

Take Home Pearl:
Sudden brief episodes of tapering tinnitus are extremely common, occur in about 75% of individuals, and are almost always monaural.

Background: Usually studies that document the incidence of tinnitus are talking about tinnitus that occurs all the time or is the source of a physician visit. However, though few studies have made attempts to document this phenomenon, many people have experienced very brief episodes of tinnitus.

Objective: To document the incidence and quality of sudden brief unilateral tapering tinnitus (SBUTT).

Design: Observational survey.

Participants: Part I of the study included 62 individuals, 39 of whom were men. Ages ranged from 18 to 74 years. Part II included 74 patients, 71 of whom completed this portion of the study.

Methods: This study had 2 parts. The first determined the prevalence of SBUTT among subjects recruited from the authors' personal contacts. Subjects were polled if they had tinnitus, if they had normal hearing, and if they experienced tinnitus after loud sound. A total of 25 maneuvers were performed, such as jaw clenching, and subjects were asked if any tinnitus was experienced or if tinnitus changed during the maneuver. Part II of the study included volunteers who had experienced SBUTT in the past. These subjects were asked to keep a log of their SBUTTs for 4 months. The diary included the time of the event, activity at the time, duration, quality of the tinnitus, and an estimate of the surrounding noise level.

Results: Of the 62 patients in the initial study, 76% could recall having an

SBUTT. The age of those who had experienced these episodes was similar to those who had not. SBUTTs were also equally split between men and women. In total, 74% of men experienced tinnitus after loud sound, but only 39% of women experienced this. In phase II of the study, the subjects experienced an average of 1.2 SBUTTs per month, but 26% of patients who had experienced SBUTTs in the past did not experience any during the study period. Interestingly, those who heard SBUTTs always heard them monaurally and it was twice as common in the right ear. Two-thirds of subjects always heard the SBUTT in the same ear. The average duration was 29 seconds with a maximum of 10 minutes.

Conclusions: SBUTTs occur in about 75% of individuals and are usually monaural.

Reviewer's Comments: This study was interesting in that it documents that brief episodes of tinnitus are extremely common. It is also interesting that these episodes seem to be almost exclusively monaural, which implies that they occur prior to the auditory decussation in the brainstem. Occasionally I have patients tell me about symptoms like these, and based on this paper I can now say definitively that this experience is very common and is unlikely to be related to any pathology.

Reviewer: Benjamin T. Crane, MD
Article Reviewed: Oron Y, Roth Y, Levine RA. Sudden Brief Unilateral Tapering Tinnitus: Prevalence and Properties. *Otol Neurotol* 2011; 32 (December): 1409–1414.

Do Bone-Anchored Hearing Devices Provide Enough Bang for the Buck?

Cochlea/Auditory Nerve

Take Home Pearl:

Bone-anchored hearing devices meet British standards for cost per quality-adjusted life-year.

Background: Bone-anchored hearing devices (BAHD) have revolutionized the treatment of single-sided deafness as well as offering a reasonable alternative to hearing aids for patients with conductive hearing loss or frequent ear infections. In the United Kingdom, a treatment is considered cost-effective if it costs less than $45,000 per quality-adjusted life-year (QALY).

Objective: To determine the cost effectiveness of BAHD.

Design: Prospective cohort case-control analysis

Participants: 147 adult patients being offered their first BAHD between April 2007 and June of 2008 were given a 15-item questionnaire; 89 patients returned the questionnaire, and 85 underwent implantation by the end of 2008. In total, 70 of these patients returned a second questionnaire after using the BAHD for 3 months.

Methods: A health measure was made before and after BAHD implantation to estimate the benefit of the device. Economic costs were determined using 2008 pricing.

Results: The total cost for the BAHD was $8,534 initially with an additional annual cost of $1,506. The average lifetime cost was $32,145 based on the patient's life expectancy. This represented a cost of $30,906 over a hearing aid. The baseline utility score was 0.59 prior to implantation and 0.66 after implantation. Based on life expectancy, the average QALY gain was 1.89. Thus, the BAHD costs about $26,415 per QALY.

Conclusions: Based on these results, BAHD is cost effective by British standards.

Reviewer's Comments: I am not sure it is really important to factor the cost of a hearing aid into the calculation of the alternative to a BAHD since many of these patients probably had single-sided deafness and were not good hearing aid candidates. In the United States, health insurers do not have the rigid standards that apparently exist in the United Kingdom. However, the question over whether BAHD are a cost-effective technology is one that remains important to insurers. This study might be used to effectively argue with insurers.

Reviewer: Benjamin T. Crane, MD
Article Reviewed: Monksfield P, Jowett S, et al. Cost-Effectiveness Analysis of the Bone-Anchored Hearing Device. *Otol Neurotol* 2011; 32 (October): 1192–1197.

Do Cochlear Implants Still Present a Significant Risk of Meningitis?

Cochlea/Auditory Nerve

Take Home Pearl:

Despite changes in implant design and campaigns to vaccinate cochlear implant recipients, there remains occasional cases of meningitis.

Background: Meningitis is one of the most feared complications of cochlear implantation (CI). This complication has gotten a lot of attention since 2002 when there were suddenly several well-publicized cases. Many of these cases were related to an electrode with a positioner that is now no longer on the market. Furthermore, it is now recommended that patients undergo immunization against *Streptococcus pneumoniae* to lessen the risk of meningitis. The current recommendation for CI recipients is for children aged <2 years to have the 13-valent vaccine (PCV13) followed by the 23-valent vaccine (PCV23) after age 2 years. For adults only, PCV23 is needed.

Objective: To describe the cases of meningitis after CI and determine the current risk.

Design: Retrospective review and expert opinion.

Participants: 283 patients who got meningitis after CI since 2002. Additional patients were sent surveys.

Methods: The authors sent 758 surveys to CI recipients at their institution. The survey asked about compliance with vaccination.

Results: Incidence of meningitis per 100,000 patient-years is <5 in the general population, 450 in patients who had a CI with a positioner, and 11 to 14 in CI without a positioner. A total of 283 cases of meningitis have been reported since 2002, which have resulted in 30 fatalities. Ninety of these cases were reported in 2002, but there

continues to be 10 to 30 cases a year every year since then. Of patients sent the survey, the response rate was 15%. All but 1 of 56 adults responding had been appropriately vaccinated. Of 61 children who responded, 74% had the appropriate vaccination, with the remaining patients missing at least 1 injection. The authors recommend documentation of full vaccination prior to CI. The authors also recommend sealing the cochleostomy with fascia to lessen the chance of cerebrospinal fluid exposure.

Conclusions: Bacterial meningitis after CI remains a significant problem. Surgical technique and vaccination likely decrease but do not eliminate the risk.

Reviewer's Comments: There is a perception in some circles that use of currently available cochlear implants and vaccination eliminates the risk of post-implant meningitis. Although the risk is small, it is higher than the risk in the general population. The survey undertaken by the authors, although it had a poor response rate, demonstrates that the rate of compliance with vaccination is much less than ideal.

Reviewer: Benjamin T. Crane, MD
Article Reviewed: Lalwani AK, Cohen NL. Does Meningitis After Cochlear Implantation Remain a Concern in 2011? *Otol Neurotol* 2012; 33 (January): 93–95.

PSCC of the Head & Neck Has Good Prognosis

General

Take Home Pearl:
Papillary squamous cell carcinoma has good prognosis despite its tendency to present with neck disease and to recur.

Background: Papillary squamous cell carcinoma (PSCC) of the head and neck is an uncommon pathology, and it has been associated with human papillomavirus (HPV)-like oropharyngeal squamous cell carcinoma. There have been previous series, and it has been unclear how these PSCCs behave.

Objective: To report the authors' series on this rare pathology.

Design/Methods: This is a retrospective non-controlled series on papillary squamous cell carcinoma from 1979 to 2008 at a single institution. Demographics, risk factors, subsites, treatment types, recurrence, and survival rates were measured.

Results: PSCC occurred within the laryngopharynx and the oral cavity and less so in the oropharynx. Much like previous series, the rate of neck disease was 27%. Oropharyngeal or laryngeal lesions were treated with radiation ± chemotherapy. The recurrence rate was 25%, but recurrence rate for sinonasal lesions was 75%. Five-year disease-free survival rate was 46%, and the overall survival rate was 72%. More men were noted to have PSCC. Papilloma disease was noted to present 23% of the time.

Conclusions: Papillary squamous cell carcinomas have an uncommon behavior, but they have a good prognosis despite high rates of locoregional recurrence.

Reviewer's Comments: PSCCs have been associated with HPV, but its behavior is quite distinct. Recurrence rates are noted to be high, but the overall prognosis was noted to be 72%. Other series have recurrence rates to be as high as 39%. Neck disease is also high, but this does not appear to affect prognosis. Although this paper did not look extensively at the relationship with HPV, others noted 50% positivity of HPV in some series.

Reviewer: Young J. Kim, MD
Article Reviewed: Russell JO, Hoschar AP, Scharpf J. Papillary Squamous Cell Carcinoma of the Head and Neck: A Clinicopathologic Series. *Am J Otolaryngol* 2011; 32 (November): 557–563.

Factors Related to Catastrophic Events Following Tracheotomy Worthy of Consideration

Laryngotracheal

Take Home Pearl:
Catastrophic events after tracheotomy may be prevented with systematic quality improvement.

Objective: To obtain information regarding catastrophic complications during and following tracheotomy.

Design: National survey.

Participants: Members of the American Academy of Otolaryngology — Head and Neck Surgery (AAOHNS) were included. Mean years of experience including residency was 21.2 years. The majority of respondents reported caring for patients with tracheotomy; approximately two-thirds reported care primarily for adult patients, while about 10% reported care primarily for pediatric patients. More than half of respondents reported caring for at least 1 patient experiencing a catastrophic event associated with tracheotomy.

Methods: Approximately 10,000 members of the AAOHNS were presented with an electronic survey, which included 26 questions regarding complications after tracheotomy. Respondents were queried regarding experiences with tracheoinnominate artery fistula (TIF), tracheoesophageal fistula (TEF), acute tracheotomy occlusions, and obstructive granulomas. Open-ended questions about "catastrophic complications" were also posed. Results were anonymous.

Results: Of 469 respondents, 759 catastrophic events were reported, which equated to 0.097 events per physician year. A higher frequency of TIF, TEF, and events leading to death or disability was reported by physicians practicing in academic medical centers. TIFs per physician year were highest in those providing care to pediatric patients. Laryngologists reported more TEFs, acute occlusions, and overall catastrophic events. General otolaryngologists and otologists reported the fewest complications. The majority of events occurred >1 week following tracheotomy, and many occurred in long-term care facilities or patient homes. The majority of catastrophic events were associated with accidental decannulation, bleeding, and trach

tube occlusion. Overall, 177 events led to death and an additional 38 led to permanent disability. Twenty-four catastrophic events occurred during routine trach changes and 15 during patient repositioning.

Conclusions: Because the majority of tracheotomy-related complications occur after the immediate postoperative period, focus on education and care of these patients may be most beneficial for preventing catastrophic complications.

Reviewer's Comments: Because of potential response and recall bias, extrapolation of the prevalence data may be difficult in the general population. Individuals having experienced catastrophic events may be more likely to respond. In contrast, events unknown by the otolaryngologist occurring following discharge were not reported. As a result, it is more important to consider the trends in the data. One of the most striking findings is that significant tracheotomy-related complications are more likely after the immediate postoperative period and are common after discharge from the acute medical setting. This suggests the importance of education of family members and caregivers caring for individuals after tracheotomy. How to manage accidental trach dislodgement and provide appropriate care to prevent and/or manage mucous plugging should be emphasized for individuals caring for patients following tracheostomy. Implementation of simple safety education has the potential to substantially reduce morbidity and mortality following tracheotomy.

Reviewer: Heather Starmer, MA, CCC-SLP
Article Reviewed: Das P, Zhu H, et al. Tracheotomy-Related Catastrophic Events: Results of a National Survey. *Laryngoscope* 2012; 122 (January): 30–37.

Heads Up — HIPAA Enforcers Mean Business

Miscellaneous

Take Home Pearl:

It is anticipated that providers in small groups may not take the time to implement HIPAA regulations as compared to hospitals for which privacy/confidentiality of patient records is part of The Joint Commission survey process.

In recent years, the Office for Civil Rights (OCR) has become increasingly more stringent when it comes to compliance with the Health Insurance Portability and Accountability Act (HIPAA).

Recent Violation: Cignet Health in Maryland violated the HIPAA Privacy Rule and received a $1.3 million civil monetary penalty from Health and Human Services (HHS). Cignet Health's penalty came after they failed to provide patients with copies of their medical records within 30 days (and no later than 60 days) of each patient's request. Cignet Health also received a $3 million fine for refusal to cooperate with OCR during the investigation. This case is the first violation case of the HIPAA Privacy Rule based on the increased penalty amounts authorized in the Health Information Technology for Economic and Clinical Health (HITECH) Act, which dramatically altered what constitutes a HIPAA violation. The drastic monetary fine can be attributed to Cignet's failure to cooperate with the OCR; the cost of compliance would have been much less.

Enforcement: OCR will continue to aggressively enforce the rules. Although compliance with HIPAA rules applies to all providers, it is anticipated that providers in small groups may not take the time to implement HIPAA regulations as compared to hospitals, which are more likely to be compliant since privacy and confidentiality of patient records is part of The Joint Commission (TJC) survey process. Organizations are encouraged to reevaluate their HIPAA compliance efforts and to respond should OCR investigate.

Audits & Investigations: Hospitals are reminded that they need an effective infrastructure to maintain protected patient records for long periods and to obtain those records quickly if requested. According to HITECH, the federal government is required to complete periodic HIPAA hospital audits. The OCR must conduct an investigation for any complaint of a HIPAA violation. Organizations should identify where vulnerabilities exist according to a risk analysis that examines all components of HIPAA compliance. The implementation of HIPAA's regulations must be tailored to the specific organization. Other suggestions include making someone responsible to stay on top of the constantly revising HIPAA policy development process, making sure that the procedures are part of everyday organizational culture. Organizations should conduct regular internal audits, train employees according to the regulations, and have a plan of action should violation incidents occur.

Reviewer's Comments: This article alerts us to the fact that HIPAA enforcers mean business and are making money in that business. At greatest risk are the smaller groups who do not have to prepare for visits from TJC and who have not devoted the time, attention, and staff needed to fully comply with HIPAA, whose rules and regulations continue to evolve as enforcement intensifies. We must keep in mind the importance of patient confidentiality as we go through our daily clinical work.

Reviewer: C. Richard Goldfarb, MD
Article Reviewed: Eramo LA. Layin' Down the Law — OCR Ready to Put a Hurtin' on HIPAA Violators. *For the Record* 2011; 23 (June 6): 10.

How Useful Is Rib Cartilage in Rhinoplasty?

Rhinoplasty

Take Home Pearl:

The mechanical strength of 1.0 and 1.5 mm thickness costal cartilage grafts is similar to that of septal cartilage grafts and may be of most utility in rhinoplasties.

Background: Autogenous cartilage grafts are frequently used in rhinoplasties. Septal cartilage is generally the first choice; however, when this is not available, auricular and costal cartilages are often used.

Objective: To evaluate the tensile and dimensional characteristics of costal cartilage that will provide the closest approximation to septal cartilage in grafts harvested from fresh cadavers.

Methods: Septal cartilage grafts and costal cartilage grafts from the seventh rib were harvested from fresh cadavers. Grafts measuring 1.0 mm, 1.5 mm, and 2.0 mm were harvested from the central portions of the costal cartilage. Tensile testing results were presented as a force-elongation curve.

Results: The strength value of the septal cartilage grafts on average was higher than that of costal cartilage grafts (12.42 MPa vs 5.03 MPa; P =0.001). The tensile force for the 1.0 mm and 1.5 mm thickness costal cartilage grafts was similar to that of the septal cartilage (P =0.09 and 0.32, respectively). However, a significant difference was observed between the 2.0 mm costal cartilage thickness group and the septal cartilage group (P =0.04).

Conclusions: Costal cartilage grafts of 1.0 and 1.5 mm thickness appear to most closely resemble the tensile characteristics of their septal cartilage counterparts.

Reviewer's Comments: Frequently in revision and augmentation rhinoplasties, additional grafting materials are necessary when septal cartilage may not be available. This study provides mechanical testing data to the costal cartilage material. However, variables such as degree of calcification of costal cartilage and also the location where the costal cartilage grafts will be used will ultimately determine how they are used intraoperatively.

Reviewer: Tang Ho, MD
Article Reviewed: Alkan Z, Yigit O, et al. Tensile Characteristics of Costal and Septal Cartilages Used as Graft Materials. *Arch Facial Plast Surg* 2011; 13 (September–October): 322–326.

Extensive Dissection Is Not Associated With Higher Palsy Rate

Thyroid/Parathyroid

Take Home Pearl:

Extensive dissection of recurrent laryngeal nerve may not be associated with an increased rate of laryngeal nerve paralysis.

Background: There are a handful of reports that extensive nerve dissection during thyroidectomy can result in vocal fold paralysis. Most paralysis is temporary, but the rate of permanent laryngeal nerve paralysis is 2%, and the rate of temporary paralysis can be up to 10%. There is still an unknown variable, and that is what "extensive dissection" actually means.

Objective: To examine the authors' series on nerve paralysis after extensive dissection.

Design/Methods: This is a retrospective non-controlled case series in a single institution by a single surgeon. In total, 506 dissected nerves were included in this study; 101 nerves had extensive nerve dissection that required 5 cm of nerve exposure, of which 13 were due to reoperation. Intraoperative nerve monitoring was used during this series. The authors compared the nerve paralysis rate between the group that had extensive dissection versus those who did not have extensive dissection.

Results: The authors reviewed their series and found no significant increase in nerve palsy rate. The rate of temporary nerve palsy was 2% and the rate of permanent paralysis was 0%. These rates compared favorably with those who did not undergo extensive nerve dissection.

Conclusions: Extensive dissection is not associated with higher palsy rate.

Reviewer's Comments: By narrow standards, this is not a clean study. The control group that did not have "extensive dissection" is not clearly defined. In fact, the report does not segregate reoperation dissection versus fresh dissection, which is an important variable. There is also a sampling bias, and it is unclear whether the authors had a different surgical approach for difficult cases, which is unavoidable. The take-home message of this report, however, is that careful dissection is warranted when it comes to recurrent laryngeal nerve surgery and that it can substantially reduce nerve injury.

Reviewer: Young J. Kim, MD
Article Reviewed: Chiang F-Y, Lu I-C, et al. Does Extensive Dissection of Recurrent Laryngeal Nerve During Thyroid Operation Increase the Risk of Nerve Injury? Evidence From the Application of Intraoperative Neuromonitoring. *Am J Otolaryngol* 2011; 32 (November): 499–503.

Case Volume Affects Fine-Needle Aspiration Interpretation

Thyroid/Parathyroid

Take Home Pearl:

Low-volume pathologists are more likely to call atypical cells that are benign on final surgical pathology.

Background: In the field of clinical research, there's been a trend that case volume improves outcomes in surgical cases. Authors of this report applied this reasoning in the case of fine-needle aspiration (FNA) for thyroid nodules. FNA is currently recognized by the ATA, the NCI, and the NCCN as the primary work-up for thyroid nodules. However, there is clearly significant variability in the interpretation of FNA.

Objective: To determine whether case volume can provide a more accurate FNA result of thyroid nodules.

Design/Methods: This is a retrospective series comparing FNA obtained from 3 different types of hospitals. The authors categorized pathologists as either low-volume FNA pathologists (<50 FNA) or high-volume pathologists (>50), and analyzed their interpretations in comparison to the final surgical pathology. Yield of non-diagnostic FNA was also correlated with the FNA case volume performed. Less than 20 aspirations was considered as low volume.

Results: The authors analyzed FNA from 790 patients performed by 134 clinicians and interpreted by 16 pathologists. They found that low-volume pathologists had a higher rate of reporting atypical cells and were less likely to report benign cells in comparison to higher-volume pathologists. These atypical cells read by low-volume pathologists were more likely to be benign in the final surgical pathology in comparison to high-volume pathology FNA read. Interestingly, there were no differences in low- versus high-volume clinicians in their rate of obtaining non-diagnostic FNA.

Conclusions: Case volume affects FNA interpretation.

Reviewer's Comments: This is an interesting finding that is not surprising. One pitfall in this study is that 3 different hospitals were studied, and it is unclear whether each hospital had the same preparation and processing for the slides. Furthermore, many hospitals have multiple pathologists read the atypical cells, and it is unclear if this impacts the final read. Regardless, this is an interesting study that suggests that case volume of FNA reading is an important variable in the management of thyroid nodules.

Reviewer: Young J. Kim, MD
Article Reviewed: Houlton JJ, Sun GH, et al. Thyroid Fine-Needle Aspiration: Does Case Volume Affect Diagnostic Yield and Interpretation? *Arch Otolaryngol Head Neck Surg* 2011; 137 (November): 1136–1139.

What Predicts Lateral Nodal Disease in Papillary Thyroid Cancer?

Thyroid/Parathyroid

Take Home Pearl:
Superior papillary thyroid carcinoma may spread more frequently to the lateral compartments.

Background: There are clear data that lateral or central neck disease does not affect prognosis, but there has been a trend to perform elective central and lateral neck dissection for well-differentiated thyroid carcinomas. It is unclear whether this is justified by evidence-based medicine, but it would benefit the clinician to know whether there are certain risk factors for lymph node involvement.

Objective: To examine the authors' series to specifically ask for any risk factors that are associated with neck disease.

Design/Methods: This is a retrospective analysis of patients with papillary thyroid carcinoma (PTC) from 2004 to 2010 at a tertiary center. Tumor characteristics were correlated with either central or lateral nodal involvement. Histologic subtypes of PTC, size, extrathyroidal involvement, location within the gland, multifocality, and lymph node involvement were noted.

Results: Two hundred one patients were included, and metastatic nodal disease was noted in 81 (40%) patients. Of these, 21% had only central disease, 5% had lateral neck disease, and 14% had both. In this analysis, lateral nodal disease was correlated with distant metastases, extrathyroidal disease, and tumor located in the superior lobe. Conventional PTC was associated with lateral neck disease.

Conclusions: PTC located in the superior aspect of the thyroid gland may have higher rate of lateral neck disease.

Reviewer's Comments: This is an interesting study in that it reports that superior lesions are 4.5 times more likely to have lateral neck disease. This is a corroboration of the Japanese study in 2002 that examined microcarcinomas. The major problem with this report is that the authors include primary surgery as well as secondary surgery in the analysis. For many reasons, this is not a landmark study, but this notion that the superior lobe lesion more likely has lateral nodal disease warrants further studies.

Reviewer: Young J. Kim, MD
Article Reviewed: Hunt JP, Buchmann LO, et al. An Analysis of Factors Predicting Lateral Cervical Nodal Metastases in Papillary Carcinoma of the Thyroid. *Arch Otolaryngol Head Neck Surg* 2011; 137 (November): 1141–1145.

Detection of Bone Over the Superior Semicircular Canal — How Thin Can You Go?

Vestibular System

Take Home Pearl:
Due to limits in resolution, clinical CT scans can miss a thin layer of bone over the superior canal. Openings <3 mm are often overestimated.

Background: Superior semicircular canal dehiscence (SSCD) syndrome is perhaps one of the newest diagnoses in otolaryngology. Although computed tomography (CT) is a part of the work-up for this condition, false-positive results can commonly occur.

Objective: To determine accuracy of CT scan for diagnosis of superior SCD.

Design: Prospective cadaveric study of 11 human cadaver heads.

Methods: Canal dehiscences of varying sizes were created by 2 neurotologists via a standard middle fossa approach. The heads were then placed in water. In the first 6 heads, the dehiscences were made over a large range. In the remaining 5, the focus was on smaller dehiscences and thinned bone. Each head underwent CT scanning using a standard clinical scanner, which was thought to have a 0.1-mm resolution, and then the images were reconstructed in the superior canal plane. These scans were then read by neuroradiologists who determined the size of the dehiscence. The heads also underwent scanning with a microCT, which was thought to have 18 μm resolution.

Results: 2 ears had to be discarded, leaving 20 ears in the study. Using the clinical CT scan found a dehiscence in 19 of these specimens, with the remaining specimen found to be intact. The higher-resolution microCT showed 12 ears to have a dehiscence and 8 to be intact. Thus if microCT is considered the gold standard, a clinical CT has a high-false positive rate such that the sensitivity of clinical CT is 100.0%, but the specificity in this series was only 12.5%. The average size of the dehiscence on clinical CT was 3 mm. MicroCT measured the dehiscences as a size not significantly different than the physical measurement made during the procedure. However, the clinical CT tended to overestimate the dehiscence size, which was especially problematic for dehiscences <3 mm. The authors point out that the incidence of SSCD based on CT scan decreases as the resolution of the scan increases.

Conclusions: Even with the best clinical scanner available, the rate of false positives will be unacceptably high to base surgical decisions on the images alone.

Reviewer's Comments: This paper reinforces an important point — CT scan alone is inadequate for the diagnosis of SCD, although a CT scan demonstrating bone over the superior canal is certainly adequate to rule out the diagnosis. One question I have often had, which unfortunately this study does not address, is how bone has to be over the superior canal for the CT scan to detect it. It seems that, if this study had just gone a step further and measured the thickness of the bone over the superior canal after the CT scans were done, this question could have been answered.

Reviewer: Benjamin T. Crane, MD
Article Reviewed: Sequeira SM, Whiting BR, et al. Accuracy of Computed Tomography Detection of Superior Canal Dehiscence. *Otol Neurotol* 2011; 32 (December): 1500–1505.

Plugging Superior Canal Dehiscence — Are Two Sides Better Than One?

Vestibular System

Take Home Pearl:
In select patients with bilateral superior semicircular canal dehiscence syndrome, bilateral plugging offers a significant benefit.

Background: The symptoms of superior canal dehiscence syndrome (SCDS) are classically pressure- or sound-evoked nystagmus and oscillopsia, conductive hyperacusis, and autophony. Usually the symptoms are unilateral, but bilateral SCDS is less common. Plugging of the superior canal is the definitive treatment for SCDS.

Objective: To describe the characteristics of patients with bilateral SCDS who choose to undergo second-side surgery, and the relative benefits of this surgery.

Design: Prospective observational study.

Participants: 5 patients with bilateral SCDS, mean age at presentation 35 years.

Methods: The diagnosis of SCD was based on clinical symptoms, signs on physical exam, and testing including CT scan, audiometry, and vestibular-evoked myogenic potential. This paper reviews a subset of subjects with bilateral SCDS who opted to have surgery on both sides. These surgeries were done via a middle fossa approach with plugging of the superior canal. The postoperative symptoms were gauged using dynamic visual acuity, head thrust testing, the dizziness handicap inventory, and short-form 36 survey.

Results: Since 1998, Johns Hopkins has done surgery on 117 patients with SCDS. Of these, 38% or 45 patients had bilateral dehiscence, but only 5 of these patients elected to have second-side surgery. The mean time between the initial surgery and the second surgery was 22 months. Autophony was present in 4 of these patients, and sound- or pressure-induced vertigo was also present in 4 patients. Pulsatile tinnitus was a symptom in 3 of the patients. Three of 5 patients noted that symptoms shifted to the contralateral side immediately after the initial plugging. In the remaining 2 patients, contralateral symptoms developed years after the initial plugging. There was transient oscillopsia in 2 of 4 patients in whom data were available. All the patients felt the symptoms were improved after surgery. There were no significant major complications from the second-side surgery such as facial weakness, cerebrospinal fluid leak, or speech or language deficits. One patient did have evidence of recurrence of symptoms on the first side after the second-side surgery.

Conclusions: Bilateral SCD plugging can be beneficial in a select group of patients.

Reviewer's Comments: Although I find the authors' results encouraging and I think I would certainly be willing to do a bilateral SCD repair in a select group of patients, this is something that should be carefully considered. Only about one-third of patients with symptomatic unilateral SCD elect to undergo surgery. And, in those who do and have a contralateral dehiscence, only 11% undergo the contralateral surgery. Thus, the patients presented here represent a very select group that likely had the most severe symptoms and were carefully counseled about the potential for postoperative complications such as oscillopsia.

Reviewer: Benjamin T. Crane, MD
Article Reviewed: Agrawal Y, Minor LB, et al. Second-Side Surgery in Superior Canal Dehiscence Syndrome. *Otol Neurotol* 2012; 33 (January): 72–77.

Practical Reviews presents Critiques in Otolaryngology—Head & Neck Surgery quiz Vol. 21 No. 5
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E-quiz code: 31695N

1. If the first lumbar drain fails to control a cerebrospinal fluid leak, placement of a second lumbar drain may be successful.

   Practice: T F ***Answer Submitted:*** **T F**

2. False-negative is a significant problem when using most common clinical CT scanners to diagnosis superior canal dehiscence.

   Practice: T F ***Answer Submitted:*** **T F**

3. Patients who experience sudden brief unilateral tapering tinnitus usually experience it at least every 2 weeks.

   Practice: T F ***Answer Submitted:*** **T F**

4. Transient cochlear ischemia in gerbils causes more inner hair cell loss than outer hair cell loss.

   Practice: T F ***Answer Submitted:*** **T F**

5. In a recent study, only 1 in 9 patients with bilateral superior semicircular canal dehiscence elected to have second-side surgery.

   Practice: T F ***Answer Submitted:*** **T F**

6. Patients with cardiac conditions are at elevated risk for in-hospital mortality following tracheotomy.

   Practice: T F ***Answer Submitted:*** **T F**

7. Tracheoinnominate artery fistula is most common in geriatric patients.

   Practice: T F ***Answer Submitted:*** **T F**

8. Variability in post-tracheotomy care suggests the need for clinical practice guidelines.

   Practice: T F ***Answer Submitted:*** **T F**

9. OK-432 is useful for microcystic lymphangiomas, while doxycycline should be used exclusively for macrocystic types.

   Practice: T F ***Answer Submitted:*** **T F**

10. Open surgical reconstruction of Wegener subglottic stenosis is not associated with higher rate of failures.

    Practice: T F ***Answer Submitted:*** **T F**

11. Small physician organizations and private practices are not required to comply with HIPAA regulations as stringently as hospitals.

    Practice: T F ***Answer Submitted:*** **T F**

12. The lifetime cost of a bone-anchored hearing device is less than that for a hearing aid.

    Practice: T F ***Answer Submitted:*** **T F**

13. Carcinoid is the most common malignant pediatric tracheal and endobronchial tumor.

    Practice: T F ***Answer Submitted:*** **T F**

14. Since 2002, <10% of cases of meningitis after cochlear implantation have resulted in fatality.

    Practice: T F ***Answer Submitted:*** **T F**

15. Extensive nerve dissection is associated with a permanent nerve paralysis rate of 10%.

    Practice: T F ***Answer Submitted:*** **T F**

16. Papillary squamous cell carcinoma has a high rate of neck disease and recurrence that is associated with poor prognosis.

    Practice: T F ***Answer Submitted:*** **T F**

17. High-volume fine-needle aspiration (FNA) decreases the rate of non-diagnostic FNA.

    Practice: T F ***Answer Submitted:*** **T F**

18. Papillary thyroid carcinoma located in the superior aspect of the thyroid gland may have more metastases to the lateral neck.

    Practice: T F ***Answer Submitted:*** **T F**

19. Costal cartilage grafts of 1.0 and 1.5 mm thickness appear to most closely resemble the tensile characteristics of their septal cartilage counterparts.

    Practice: T F ***Answer Submitted:*** **T F**

1. T Non–echo-planar imaging (EPI) has significantly better sensitivity and positive predictive value compared to EPI imaging for diagnosing recurrent cholesteatoma.

2. F Most patients require multiple applications of basic fibroblast growth factor to heal their tympanic membrane perforation.

3. T The presence of diplopia on clinical examination is a significant clinical predictor for surgical intervention in pediatric periorbital infections.

4. T Fractional nonablative CO_2 laser treatments appear to improve overall postsurgical facial scar appearance.

5. F The introduction of cochlear implants was met with enthusiastic support from the otolaryngology community even at the early stages of development.

6. T Using a combined approach for vestibular schwannoma resection leads to a significantly higher rate of cerebrospinal fluid leak.

7. F In patients presenting with irreversible paralysis of the lower face, reanimating this region through the use of nerve grafts is the most effective treatment option.

8. T When using the temporalis muscle transfer to treat irreversible paralysis of the lower face, the classic approach may leave the patient with a bulge over the zygomatic arch on the injured side of the face.

9. T When performing the transbuccal approach to temporalis tendon transfer, the coronoid process can be identified without removing the zygomatic arch.

10. T During a temporalis tendon transfer, fixing the tendon to the point of attachment with extensive tension on the muscle fibers can diminish the muscle's dynamic range of motion.

11. T To get movement on the side of the face that underwent temporal tendon transfer, patients must practice generating a "temporal mouth" by thinking about biting the molars and premolars.

12. T For facial reanimation, good candidate muscles for free muscle transfer include the gracilis muscle, the pectoralis minor muscle, and the latissimus muscle.

13. F A patient who previously had normal facial movement but presents with a gap in the facial nerve after undergoing parotidectomy will not benefit from direct repair of the facial nerve.

14. T In patients with facial paralysis of the lower face, the paralysis may be reversible if electromyography demonstrates fibrillation in the affected muscles.

15. T In patients undergoing facial reanimation, approximately 30% of the hypoglossal nerve can be taken via a partial neurotomy when doing a hypoglossal nerve transfer without losing tongue movement or causing asymmetric tongue movement.

16. F Patients as young as 4 and 5 years old who undergo partial hypoglossal neurotomy tend to not do very well; they cannot move their face without moving their tongue and the result is not that of a normal smile.

17. F Patients with head and neck squamous cell carcinoma who have more significant weight loss during chemoradiotherapy have higher rates of locoregional failure.

18. T On average, ocular vestibular evoked myogenic potential testing takes <30 minutes to complete on a single subject.

19. T Excision of facial hemangiomas is best performed during the involutional stage of the tumor.

20. T For Samter's triad patients undergoing endoscopic sinus surgery, postoperative topical corticosteroids do not appear to confer any additional benefit over saline alone.

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