Perception Plays Important Role in Rehabilitation of Migraine Sufferers

Vestibular Rehabilitation Outcomes in Patients With a History of Migraine.

Wrisley DM, Whitney DL, Furman JM:
Otol Neurotol 2002; 23 (July): 483-487

Patients with a migraine history and vestibulopathy unrelated to migraine do well with vestibular rehabilitation, but patient perception is that they do not improve as much as those without a migraine history.

**Background:** This is a follow-up to a study by this same group. Previously, improvements in performance were found after vestibular rehabilitation but there was no control group since all study participants had migraines.

**Objective:** Compare results of vestibular rehabilitation in patients with and without migraine.

**Design:** Retrospective chart review.

**Participants:** 6 men and 25 women with mean age 54±18 years and a 15-month duration of dizziness.

**Methods:** Patients with migraine-associated vertigo as a primary diagnosis were not included. Of patients, 25 were also included in the prior study. These patients were matched with historical control patients. The matching process found subjects who had the same diagnosis, an age range ≤5 years, and similar testing results. The control group was similar in age and symptom duration. Patients were asked to verbally rate their symptoms on a perception of dizziness symptoms (PDS) scale from 0 to 100. Patients also completed the dizziness handicap inventory (DHI) and activities-specific balance confidence scale (ABC). The dynamic gate index (DGI) was calculated based on the patient's ability to perform 8 gait tasks.

**Interventions:** All patients received customized vestibular rehabilitation. Therapy typically included habituation, canalith repositioning maneuver, stretching exercises, general strengthening, or balance and gait training.

**Results:** There was no significant difference between migraine and control groups in terms of age, gender, symptom duration, treatment duration, number of physical therapy visits or initial assessment measures. Both groups experienced an improvement in their DHI, ABC, PDS, and DGI scores after vestibular rehabilitation. The only significant difference between groups was the migraine group's improvement in DHI score was not as large. In patients with a history of migraine, DHI improved by 11 points, but the change was twice that (22 points) in patients with no history of migraine. In all self-perceived measures, migraine patients had smaller improvements than non-migraine patients.

**Conclusions:** The authors that conclude that although patients with migraine get benefit from physical therapy, they improve less in self perception of their dizziness. Thus, patients with migraine may require additional emotional support.

**Reviewer's Comments:** This study is imperfect in that it is retrospective so it relies on prior documentation which might not always include a history of migraine. However, the study was still an eye-opener for me in that it pointed out that poor performance in vestibular rehabilitation may be more a perception of migraineurs than a reality.

Additional Keywords: None

Print Tag: Refer to original journal article
Tinnitus Retraining Therapy Offers Lasting Symptom Improvement

Are Results of Tinnitus Retraining Therapy Maintained Over Time? 18-Month Follow-Up After Completion of Therapy.
Forti S, Costanzo S, et al.;
Audiol Neurotol 2009; 14 (Epub ahead of print): 286-289

Of patients who underwent tinnitus retraining therapy, 79% showed improvement.

**Background:** Tinnitus retraining therapy (TRT) seeks to train the brain to ignore tinnitus by having patients concentrate on listening to sound presented at a low level so that it is possible to hear the sound through the tinnitus without completely masking it. The therapy described in this manuscript also included a counseling component. In the past decade several studies have demonstrated a positive effect of tinnitus retraining therapy, although most of these did not attempt to assess benefit after the therapy has ended.

**Objective:** To assess long-term benefits of TRT 18 months after therapy is completed.

**Design:** Retrospective review.

**Participants:** 45 adult patients with tinnitus ≥6 months' duration who completed TRT.

**Methods:** Patients had tinnitus symptoms assessed using a visual analog scale and the tinnitus handicap inventory prior to therapy, at the end of therapy (18 months), and at the end of study (36 months).

**Interventions:** Patients were given a hearing aid (if needed) and sound generator to use ≥8 hours per day for 18 months.

**Results:** At the end of therapy, 98% of subjects continued to use their sound generator at night or during moments of stress, and hearing-impaired patients continued to use hearing aids. Tinnitus handicap inventory scores averaged 58 prior to therapy, 32 at the end of therapy, and 30 at the end of the follow-up period. Improvements were observed in relaxation, sleep, concentration, work, and social interaction.

**Conclusions:** 79% of patients improved with TRT.

**Reviewer’s Comments:** Overall, this study reported a significant improvement in symptoms after TRT. Because there is little downside to this intervention, I would not hesitate to suggest it to patients who are interested. However, this study also leaves questions unanswered. TRT requires a significant commitment on the part of the patient. In my experience very few patients are willing to make and stick with such a commitment. It is possible that those who do complete therapy are self-selected to have the best symptomatic improvement. The authors do not report how many patients dropped out of the study and for what reason. We also do not know what measures were taken to assess patients’ degree of compliance. Finally, this study includes no control group, so it is difficult to know which factors were most important in improving tinnitus scores. For instance, most patients were given hearing aids which are known to improve tinnitus even without TRT. We also do not know if these patients took other measures to relieve their tinnitus such as cutting back on caffeine intake, chocolate, and aspirin use. It is also likely that some of these patients would have had an improvement in their tinnitus just with the passage of time alone.

Additional Keywords: None

Print Tag: Refer to original journal article
Cochlear implantation improves certain hearing metrics in patients with unilateral deafness and tinnitus.

**Objective:** To assess speech recognition in noise following cochlear implantation in patients with single-sided deafness and incapacitating tinnitus.

**Participants:** 20 patients with unilateral severe tinnitus and ipsilateral sensorineural deafness of varying etiologies.

**Methods:** All patients had functional contralateral hearing, although 9 subjects used a hearing aid on the contralateral side. At the time of cochlear implantation average age was approximately 52 years with duration of deafness of almost 9 years. In all subjects, deafness and tinnitus had a similar onset so that tinnitus duration was also 9 years. Patients were evaluated 12 months after fitting of their cochlear implant using the Leuven Inteligibility Sentence Test (LIST). Evaluation was also performed with the Speech Spatial and Qualities of Hearing Scale (SSQ).

**Results/Conclusions:** One year after implantation, all patients were using their cochlear implant daily and subjectively felt that it helped them in difficult listening situations. Quantitative results demonstrated that in noise there was a small (<2 dB), but significant improvement in the speech recognition threshold after cochlear implantation. SSQ testing also demonstrated a small improvement in both patients who wore hearing aids and those with normal hearing in the contralateral ear using all the scales. In patients who wore hearing aids, the cochlear implant was found to improve performance even when noise was delivered to the side of the implant. However, this finding did not extend to those with normal hearing in the contralateral ear. The authors’ conclusions can be summarized as that there are significant improvements in some aspects of the measures hearing after cochlear implantation, but not all. The differences in pre- and post-op measures are small even when significant.

**Reviewer’s Comments:** We have all seen patients who are significantly bothered by tinnitus. Some patients are willing to bear significant financial and emotional costs in attempts to treat their symptoms. I have seen several tinnitus patients who had previously undergone surgery such as vascular loop decompression procedures in hopes of curing their tinnitus. I have no doubt that there are a significant number of patients who would be willing to undergo cochlear implantation if they thought it might improve the ringing they hear. However, we should be aware any benefit to hearing, although perhaps statistically significant is likely to be minor in comparison to that of a patient with no hearing in either ear. We must also be aware that any surgery is likely to have a significant placebo effect. This was not controlled in these patients, and would be very difficult to control. My guess is it will be a long time before there is significant acceptance of cochlear implantation as a therapy for tinnitus in patients who have serviceable contralateral hearing.

Additional Keywords: None

Print Tag: Refer to original journal article
Migraine Is Commonly Triggered By Vestibular Testing

Vertigo as a Migraine Trigger.
Murdin L, Davies RA, Bronstein AM:
Neurology 2009; 73 (August): 638-642

Migraine headache occurred in almost half of patients with a migraine history after vestibular testing.

Background: A strategy we often use to help patients manage migraine symptoms is to identify trigger factors and instruct them on how to avoid them. Common trigger factors include stress, lack of sleep, and dietary factors such as chocolate, caffeine, and red wine. There are reports in the literature of vertigo episodes, optokinetic nystagmus, and motion sickness triggering migraine.

Objective: To determine if vestibular stimulation can trigger migraine.

Design: Prospective study.

Participants: 148 new patients at the neuro-otology or neurology clinics were approached to enroll in the study.

Methods: Of approached patients, 5 declined to participate and 20 were excluded. Patients were classified as migraineurs or non-migraineurs based on International Headache Society criteria. Patients were also queried for diagnosis of migrainous vertigo according to the criteria outlined by Neuhauser and co-workers. Patients then underwent standard clinic care as prescribed by the treating physician; this included vestibular testing in test group or no testing in the control group. To be included patients also had to be naive to vestibular testing; patients were also excluded if there was no subjective response to testing or if they had daily headaches. Patients were contacted 24 hours after testing to determine if any post-visit migraine symptoms occurred. International Headache Society criteria were used to determine if a headache was a migraine.

Interventions: Patients in the vestibular test group had gaze testing, impulsive rotation, optokinetic stimulation, smooth pursuit, and bithermal water caloric testing.

Results: Within the group of migraineurs, 49% that underwent vestibular testing had a post-visit migraine headache ≤24 hours; only 5% of who did not undergo vestibular had a migraine (P =0.01). Of non-migraineurs, 12% had a headache that met migraine criteria after vestibular testing, and none of those who had no vestibular testing got a headache. In those who experienced a migraine after their visit, symptoms of dizziness, vertigo, or imbalance were reported in 46%. In 47% of those who had a post-visit migraine, onset of migraine symptoms occurred during vertigo induced by vestibular tests.

Conclusions: Approximately half of migraineurs will have a headache triggered by vestibular testing.

Reviewer's Comments: Migraine is a factor which all of us must deal with since it is so prevalent in the general population, and it is a primary or contributing factor in many patients with dizziness disorders. This paper shows a new angle by demonstrating migraine as a common sequela to caloric testing.

Additional Keywords: None

Print Tag: Refer to original journal article
Overall operative time and hospital admission length were shorter in patients undergoing simultaneous bilateral cochlear implantation.

**Background:** There are significant benefits of bilateral cochlear implantation (CI) over unilateral implantation. Bilateral CI at a young age has the potential to yield maximum benefits for deaf children. The results in adults are not directly applicable to children. In children, risks are potentially greater due to the limited ability of children to withstand prolonged operating times and blood loss. The potential for bilateral complications also needs to be considered. Potential advantages of simultaneous CI include decreased operative time, a single anesthesia, limiting costs, shorter hospitalization, and a potential benefit to development of listening skills.

**Objective:** To compare 50 children with simultaneous bilateral CI to children with sequential CI.

**Design:** Retrospective review.

**Participants:** 50 simultaneous bilateral implants compared with 55 patients who got sequential bilateral implants during 2 separate operations.

**Methods:** Surgical time, analgesia and antiemetic use, complications, and hospital stay length were compared.

**Interventions:** Bilateral CI comparing single versus separate operations.

**Results:** Surgical time was found to be significantly longer in bilateral CI cases at an average of 4 hours, 16 minutes versus 2 hours, 49 minutes for a unilateral CI. Set-up time for bilateral implantation cases was found to take 58 minutes longer due to placement of bilateral facial nerve monitors and extra time in head positioning. Total operating room time was determined and found to be 6 hours 47 minutes for sequential cases versus 5 hours and 15 minutes for simultaneous cases. Acetaminophen use after surgery was similar in both simultaneous and sequential implant patients. Differences in groups with respect to antiemetic use could likely be explained by trends in patient age. Of patients, 4 (8%) of the simultaneous group had extended hospital stays: 2 for fever, 1 for nausea, and 1 for otorrhea. Cumulative hospital stay was 2.1 days in the sequential group and 1.1 days in the simultaneous group.

**Conclusions:** The authors found no increase in complications in the simultaneous group. They also found that the simultaneous group had a shorter cumulative hospital stay and shorter cumulative operating room time. It is possible that these simultaneous patients are able to have a more smooth auditory rehabilitation since they do not have to undergo a second surgery after activation of their initial implant.

**Reviewer’s Comments:** I am a proponent of simultaneous bilateral implantation in patients with appropriate indications. However, there are some details that are missing from this study. For instance, how was it determined if a patient should undergo simultaneous versus sequential implantation? I am also curious if operative time or complication rate decreased with increasing experience with the simultaneous bilateral CI.
Standard criteria for diagnosis of migraine-associated vertigo may include other types of vertigo and may exclude some groups of patients who likely have the diagnosis.

**Background:** The association of migraine and vertigo is well established, but it can be difficult to make the migraine-associated vertigo diagnosis. Diagnosis is almost always based on the history since there are no unambiguous diagnostic tests. To help with this dilemma, criteria for migraine-associated dizziness have been proposed by Neuhauser et al in 2001. These criteria include: (1) episodic vestibular symptoms of at least moderate severity; (2) migraine headache must meet International Headache Society (IHS) criteria; (3) patient must have ≥1 migrainous symptom during the last 2 vertigo attacks. This includes headache, photophobia, phonophobia, and auras; (4) patient must have other causes for symptoms ruled out.

**Objective:** To measure incidence of associated symptoms in migraine with benign recurrent vertigo.

**Design:** Controlled prospective survey.

**Participants:** 40 patients who had benign recurrent vertigo and also met IHS migraine criteria.

**Interventions:** Telephone survey.

**Methods:** Structured telephone interviews were conducted. For validation, the same interview was conducted with 40 relatives of these patients with similar symptoms who did not seek medical attention.

**Results:** Both groups had similar features. There was an 85% female predominance, and onset of headaches tended to precede vertigo. Half of subjects had visual aura. Most subjects were free of dizziness between episodes. Only half of patients reported a headache with ≥1 of their attacks of vertigo. Stress and fatigue were the most common triggers in both groups. Relatives tended to be an average of 9 years younger and have shorter, less frequent attacks of vertigo when compared with patients.

**Conclusions:** The authors point out that we need to have concrete criteria to define migraine-associated vertigo so that diagnosis can be more precise and patients can be better classified for inclusion in studies. Neuhauser et al has proposed some criteria in their 2001 paper which are currently the standard for migraine associated vertigo studies. However these criteria may be too vague because while they may include many patients with migraine headaches, they include other sources of vertigo. Also, the authors point out that migraine-associated vertigo occurs in the absence of headache in about half of patients, thus the Neuhauser et al criteria may also miss many cases of migraine-associated vertigo.

**Reviewer's Comments:** The authors suggest that in patients with vertigo episodes lasting minutes to hours, who have headaches that meet IHS migraine criteria, and lack unilateral symptoms suggestive of Ménière’s, migraine-associated vertigo should be considered the diagnosis. After this paper was published, the Neuhauser group responded with a letter pointing out that this study had failed to point out that they had also proposed "probable" migraine criteria which this study did not address, therefore including additional patients.
Background: A sudden sensorineural hearing loss (SSHNL) is usually defined as a decrease in hearing of ≥30 dB in 3 consecutive frequencies in <72 hours. Phosphodiesterase type 5 (PDE-5) inhibitors include sildenafil (Viagra®), vardenafil (Levitra®), and tadalafil (Cialis®). They are most commonly used for male erectile dysfunction, but also occasionally used for pulmonary artery hypertension. These medications block degradation of nitric oxide by PDE-5. The most common side effects of this medication include flushing, headache, rhinitis, and visual disturbances.

Objective: Explore the relationship between SSNHL and PDE-5 inhibitors

Design: Retrospective review.

Participants: 2 patients from the author's experience, 23 cases from the Food and Drug Administration (FDA) database.

Methods: In 2007, a case of bilateral hearing loss was reported in a patient talking sildenafil, which brought up awareness of this complication. The current manuscript reviews this and 2 additional cases of SSNHL after use of PDE-5 inhibitors. In addition, the FDA database of patients who have experienced this complication is reviewed.

Interventions: PDE-5 use.

Results: In 76% of those who had onset information available, hearing loss occurred within 12 hours of taking the medication and in 88% it occurred within 24 hours. Medication most commonly used was sildenafil in 68% of cases, and 84% of patients took the medication for erectile dysfunction. Vertigo was associated with hearing loss in 32% of patients. Bilateral hearing loss was reported in only 1 patient. Complete resolution of hearing was noted in 20%, with additional 12% having some improvement in hearing. It is not documented how or if patients were treated for their hearing loss.

Conclusions: Because both sudden sensorineural hearing loss and PDE-5 inhibitor use are relatively common, it is likely that some associations between these are coincidental. The authors calculate that based on the number of people using PDE-5 inhibitors and incidence of sudden sensorineural hearing loss, we would expect 440 cases of hearing loss in PDE-5 inhibitor users. The authors trimmed this estimate down to 133 cases based on assumptions on timing of the hearing loss related to medication use. This is more than the number of cases reported in this study. However, the strong temporal relationship argues for more than a chance association. The authors also propose a mechanism by which PDE-5 could allow nitric oxide to persist in the inner ear and cause hearing loss.

Reviewer's Comments: As a retrospective review where the details of many cases are unknown, this study has its limitations. However, there is currently very little published about the association between PDE-5 inhibitors and hearing loss. This paper helps define the generally short duration of hearing loss onset and will surely bring more attention to this issue.
Post traumatic neuromas may be the cause of chronic disequilibrium or pain in patients with prior ear surgery.

**Background:** Post-traumatic neuromas have long been known to be a source of chronic pain. The pathophysiology of this pain remained mysterious until it was demonstrated that false synapses could form between efferent autonomic fibers and afferent sensory fibers within neuromas in the 1940s. This discovery led to a treatment strategy for peripheral neuromas when it was found that a local anesthetic block of sympathetic nerves could relieve pain and a sympathectomy could permanently relieve symptoms.

**Objective:** To correlate patient symptoms with histologic evidence of neuromas in the middle ear or vestibule.

**Design:** Retrospective review.

**Participants:** 83 temporal bone specimens from patients with a history of ear surgery.

**Methods:** A search of the temporal bone library at the authors’ institution revealed 20 specimens with fibrosis in the vestibule. Of patients, 12 had traumatic neuromas and the remaining 8 served as controls. Also found were 5 bones that had traumatic neuromas of the middle ear after chronic ear surgery, and an additional 58 patients who had mastoidectomies but did not develop neuromas served as a control group.

**Interventions:** None.

**Results:** Of patients with neuromas in the vestibule, 9 had a documented balance disturbance from onset of symptom until their death. Of patients, 3 had undergone labyrinthectomy for control of Ménière’s disease-related vertigo, but after surgery developed chronic disequilibrium. Disequilibrium symptoms were not documented in any control patients who had fibrosis but no neuroma formation, even though these patients were followed for a similar period after their surgery and 2 had a labyrinthectomy. In 5 bones with traumatic neuromas of the middle ear, neuromas were found on the superior segment of Jacobsen’s nerve. All of these patients reported severe pain which developed several months after radical mastoidectomy. It was noted that revision surgery gave relief for a few months and one patient had 33 revision surgeries over a 51 year period! During each of these surgeries scar tissue was removed from the middle ear which improved pain for 2-3 months. There was one incident documented where xylocaine in the middle ear relieved symptoms for several hours.

**Conclusions:** This paper provides convincing evidence that traumatic neuromas in the vestibule may be a source of chronic disequilibrium, and middle ear neuromas may be a source of chronic pain after mastoid surgery.

**Reviewer's Comments:** This paper presents a hypothesis which may explain the symptoms in a challenging subset of patients. However, it should be pointed out that none of the cases in this had the diagnosis of a traumatic neuroma during the patient's life, and there is minimal experience on how to treat this.

Additional Keywords: None

Print Tag: Refer to original journal article
MRI can be used to detect residual cholesteatoma with high sensitivity and specificity

Detection of Postoperative Residual Cholesteatoma With Non-Echo--Planar Diffusion-Weighted Magnetic Resonance Imaging.

De Foer B, Vercruysse J-P, et al::
Otol Neurotol 2008; 29 (June): 513-517

Single-shot turbo-spin echo diffusion-weighted MRI can diagnose cholesteatoma with 90% sensitivity and 100% specificity.

Background: Within the last few years, the use of non-echo--planar imaging (EPI)--based diffusion weighted sequences has been reported for cholesteatoma detection. These new turbo spin-echo (TSE) diffusion weighted sequences have fewer artifacts and much better resolution.

Objective: To determine the sensitivity and specificity of non-EPI MRI technique for cholesteatoma detection.

Design: Prospective blinded study.

Participants: 32 consecutive patients with mean age of 39 years who had undergone a first-stage cholesteatoma surgery.

Methods: All patients had CT and MRI. Radiologists were blinded to patient clinical information including the first-stage findings and CT. The decision to pursue a second-stage surgery was made by the surgeon based upon their clinical judgment. MRI was performed on a 1.5 Tesla unit using a standard Head Matrix coil. Gadolinium contrast was given.

Interventions: Second-stage surgery was performed in 19 patients.

Results: Of patients who underwent second-stage surgery, 18 had the correct diagnosis based on single-shot TSE diffusion weighted imaging alone. There were 9 true positives; of these, only 6 demonstrated typical cholesteatoma appearance on T1 and T2 images. There were 9 true negative findings on MRI; in all these cases it would have been impossible to exclude cholesteatoma on CT. In 1 case, in the motion-artifact-degraded examination, a 2mm cholesteatoma was missed in all MRI sequences. There were no false-positive cases. In patients who did not have second-stage surgery, MRI findings were consistent with no cholesteatoma in all patients. Based on these results, single-shot TSE diffusion-weighted imaging has 90% sensitivity and 100% specificity. Positive predictive value was 100%, and negative predictive value was 96%.

Conclusions: This study demonstrates the extreme sensitivity of single-shot TSE diffusion-weighted MRI for diagnosis of cholesteatoma. In fact, if scans with motion artifact are excluded, sensitivity would approach 100%.

Reviewer's Comments: To me this is a very exciting finding because it has the potential to make many second-stage cholesteatoma surgeries unnecessary. However, I would still have some reservations about adopting technique in my own practice. The authors of this paper are clearly experts on the single-shot TSE diffusion-weighted technique. I would be concerned that at my own center, radiologists would be less familiar with the technique and results would not be as accurate as those described in this manuscript. Even if only an occasional cholesteatoma is missed, it could have considerable morbidity for the patient down the road. However, as experience with this technique grows I believe so will surgeons’ confidence in it.

Additional Keywords: None

Print Tag: Refer to original journal article
Ear candles have significant risks and no potential benefit.

**Background:** Ear candles are a product promoted by the alternative medicine community as an inexpensive, safe, and effective method of removing cerumen. The procedure involves placing a hollow candle in the external auditory canal. Foil or paper is placed around the candle to catch molten wax. The candle is then lit at the opposite end. As the candle burns down a dark waxy substance collects around the base of the candle which some believe is debris and impurities which have been removed from the external auditory canal.

**Objective:** To scientifically evaluate the value of ear candles.

**Design:** Prospective study.

**Participants:** 4 volunteer subjects, 2 of which had cerumen impaction.

**Methods:** The authors of this paper first investigated the hypothesis that the ear canal produces negative pressure in the external auditory canal which draws debris out. This was done using a plastic model of the ear canal in which the pressure was measured after a candle was placed. Next, they studied the results of the ear candle in vivo using four human subjects: 2 with no cerumen and 2 with bilateral cerumen impaction. The ear candles themselves as well as the powder developed by the ear candles were examined using gas chromatography. Finally, a survey was sent to otolaryngologists in the Northwest United States to ask if they had seen patients who used ear candles, and if they had seen injuries due to the use of ear candles.

**Interventions:** Ear candles.

**Results:** After burning 20 candles of 2 different types in the model ear canal no negative pressure was produced in any trials. Gas chromatography revealed the substance at the base of the candles contained multiple alkanes--a known component of candle wax. However, no constituents of cerumen were found. In vivo testing revealed that no cerumen was removed by this practice. In one subject cerumen was pushed medially by the candle. Candle wax was found in 2 ears of subjects who did not have cerumen prior to the procedure. Of the 163 surveys sent, 122 were returned. One-third of otolaryngologists were aware of ear candle use among their patients, and 14 physicians had treated complications of ear candling for a total of 21 ear injuries in 20 patients. The injuries included 13 burns, 7 occlusions of the ear canal with candle wax, and one tympanic perforation.

**Conclusions:** The authors conclude that ear candling is a potentially hazardous practice that has no benefit. **Reviewers Comments:** After reading this article I feel much better informed and more comfortable discussing this practice with my patients who bring up the topic.

Additional Keywords: None

Print Tag: Refer to original journal article
Offering Outpatient Option When Repairing SCD

Outpatient Repair of Superior Semicircular Canal Dehiscence Via the Transmastoid Approach.

Deschenes GR, Hsu DP, Megerian CA:
Laryngoscope 2009; 119 (September): 1765-1769

Authors report outpatient superior canal dehiscence plugging via a transmastoid approach to be a safe alternative to the middle fossa approach.

**Background:** Superior canal dehiscence (SCD) has been classically addressed by plugging the superior canal via a middle cranial fossa approach. Although good results have been described with this approach, more recently a transmastoid approach has been described. The transmastoid approach has a potential advantage in that it avoids a middle fossa craniotomy.

**Objective:** To present an outpatient transmastoid approach to superior canal plugging.

**Design:** Retrospective review.

**Participants:** 2 patients with 1 having bilateral SCD.

**Methods:** The membranous canal portion of the superior canal is exposed through a transmastoid approach. The canal is followed to the dura and the dura is elevated off the superior canal. The superior canal is then fenestrated using a 1mm diamond burr. The authors describe opening the endosteum inferior to the fenestration. The authors then use bone dust and bone wax to fill the lumen of the superior canal. Conchal cartilage is used to repair the middle cranial fossa floor defect.

**Interventions:** SCD plugging.

**Results:** 3 procedures were performed; patients had improvement in SCD symptoms and went home the day of surgery.

**Conclusions:** The authors believe the transmastoid approach can be safely performed in the outpatient setting and offers advantages over the middle fossa approach.

**Reviewer’s Comments:** The primary reason to admit patients to a monitored setting after a middle fossa approach to the superior canal is that there is a small risk of an epidural hematoma. The risk is in the low single digit percentages, but serious permanent sequela are avoided when it is treated in a timely fashion. Because the authors are still exposing and elevating the middle fossa dura there is still a small risk of an epidural hematoma with this transmastoid surgery. There are also risks of other serious complications, such as cerebrospinal fluid leak, similar to the middle fossa approach. We should not assume the risk is zero just because it did not occur in the 2 patients described here. Likewise, just because these two patients were sent home immediately after surgery, does not mean every patient will do so well. We cannot assume the transmastoid approach is safer than the middle fossa approach based on the data presented here. Transmastoid surgery has some advantages, but there are also disadvantages to this approach: (1) it is difficult to directly visualize the dehiscence, and (2) the plug must be placed closer to the common crus and vestibule, increasing the risk of hypo function in other semicircular canals. I have also personally seen patients whose symptoms did not resolve after transmastoid plugging; revision surgery becomes more complicated because it is unclear if their prior dehiscence is continuing to cause symptoms or if the patient now has a second iatrogenic fistula.

**Additional Keywords:** None

**Print Tag:** Refer to original journal article
Mystery Still Surrounds Best Way to Remove Cerumen

*Ear Drops for the Removal of Ear Wax.*
Burton MJ, Doree C::
Cochrane Database Syst Rev 2009; (January): CD004326

An extensive review has shown that we still haven't demonstrated any cerumenolytic is better than placebo.

**Background:** Cerumen impaction can often be benign, but it can interfere with physical exam, cause conductive hearing loss, cause discomfort, and be a contributing factor in infection.

**Objective:** To test ear drop effectiveness for the treatment of symptomatic ear wax.

**Design:** Review and meta-analysis.

**Participants:** 86 studies were retrieved.

**Methods:** Of studies, 60 were immediately considered unsuitable. Other criteria for exclusion included in vitro trials, duplicate studies, and no data addressing the primary outcome. A total of 9 trials met all inclusion criteria. Criteria for evaluation of studies included adequacy of randomization, potential for selection bias, blinding of outcome, and quality of outcome assessment. Based on these criteria, studies were graded on a scale of A, B, or C based on their quality. For a study to be A, all criteria had to be met, B indicated each criteria was at least partially met, and C if one or more criteria were not met.

**Interventions:** Cerumenolytic, placebo, or nothing. In some studies syringing was used.

**Results:** The authors point out that studies available are of modest quality due to the fact that only a small number of subjects were studied. None of the studies demonstrated a significant difference between 2 cerumenolytics, or between any cerumenolytic and a placebo such as water or saline. The strongest results were from a study demonstrating a benefit of ear drops over no treatment. Meta-analysis was limited due to differences in methodological quality and outcome measures between studies. Of studies, 2 could be combined in a meta-analysis. After this combination, only 1 significant difference was found between a cerumenolytic and placebo - triethanolamine polypeptide placed in children's ears for 15 minutes proved better than saline at eliminating the need for syringing.

**Conclusions:** In their implications for practice, the authors conclude that there are no good data which can allow us to recommend any cerumenolytic over another. Saline and water are both effective and readily available. There is also weak evidence that a short 15-minute period of instillation of triethanolamine polypeptide ear drops prior to syringing may be helpful.

**Reviewer's Comments:** I can't say that this article will change my practice. Now when asked what the best method to remove cerumen is I can say with honesty that is unknown. Further progress in this area requires a trial comparing oil-based and water-based solvents with a placebo. This trial would have to have an appropriately large number of patients and outcome measures should be standardized.

Additional Keywords: None

Print Tag: Refer to original journal article
Chiari Malformation on MRI -- Treat Pt, Not Film

Asymptomatic Chiari Type I Malformations Identified on Magnetic Resonance Imaging.

Meadows J, Kraut M, et al.;
J Neurosurg 2000; 92 (June): 920-926

Patients can have a significant amount of cerebellar tonsil herniation and still have no symptoms.

**Background:** Chiari malformations are characterized by cerebellar herniation through the foramen magnum. The disorder can be classified into the more severe Chiari malformation type II which involves caudal displacement of the pons, medulla, and fourth ventricle. Due to the severity of symptoms, which often include hydrocephalus and other central nervous system abnormalities, this form often presents soon after birth. However, this review will only consider the more mild phenotype of Chiari malformation type I (CM-I), which involves displacement of the cerebellar tonsils through the foramen magnum into the cervical canal.

**Objective:** To determine incidence of CM-I in the general population.

**Design:** Retrospective review.

**Participants/Methods:** 22,591 MRIs were reviewed; 175 patients were found to have CM-I; 21 had films available and were found to be asymptomatic. Patients were excluded if they had other pathological findings on their MRI, or if they had symptoms which could be attributed to CM-I. In addition to their degree of tonsillar herniation, which had to be 5mm for inclusion, images were assessed for osseous abnormalities, foramen magnum size, cisterna magna, compression of the medulla, and syringomyelia.

**Interventions:** MRI.

**Results:** 175 cases of CM-I with at least 5mm of tonsillar herniation were found for an incidence of 0.77%. Most patients had symptoms which most commonly included headache. Other symptoms included weakness and altered sensation. Of patients, 25 did not have symptoms. In 4 of these, images were not available for review, leaving the remaining 21 patients to be reviewed. The amount of tonsillar herniation in this group was 11.4mm below the foramen magnum with a range of 7 to 25 mm. Deformation of the cerebellar tonsils into pointed or peg-like configuration was observed in 5 patients (24%). Compression of the medulla was observed in one-third of patients.

**Conclusions:** It is not clear why some CM-I patients remain asymptomatic. The authors discuss several theories along with strategies for managing asymptomatic patients. Because onset of symptoms for CM-I commonly occur in the third decade, it is reasonable to assume that some asymptomatic patients eventually develop symptoms. However, these data suggest that the degree of tonsillar herniation is not a sufficient basis to make this determination. The authors suggest that management decisions be made based on a number of factors which include the patient's history, symptoms, neurological exam, posterior fossa anatomy, and presence of syringomyelia.

**Reviewer's Comments:** I feel more comfortable not recommending treatment in patients with an incidental finding of CM-I. It brings back an old adage I heard in medical school about treating the patient and not the film. However, there remains a gray zone in the criteria for treating CM-I patients. It is also unclear if we need to follow these patients.

Additional Keywords: None

Print Tag: Refer to original journal article
Decreasing Wait Time Following Baha Surgery

Osseointegration Timing for Baha System Loading.

Decreasing the time of processor loading from 12 to 6 weeks following Baha implant surgery does not increase complication rate.

Background: Osseointegration, or allowing bone to grow into the titanium Baha implant, is key in the success of this procedure. The osseointegration process involves 3 major steps: (1) osteoconduction, which relies on osteogenic cells to approach the implant. This step occurs within a few days of surgery; (2) immature woven bone is formed de novo during the next week; and (3) because the bone is weak, bone remodeling occurs with increased calcification, which is complete within 2 to 3 weeks. Thus the implant is essentially healed 3 weeks after surgery. The titanium implant technology, the Baha, was initially developed for dentistry where there is much greater force on the implants and more bacteria in the area. Traditionally, the wait between the first stage placement of the Baha implant, and the loading of the processor is 12 weeks to allow osseointegration to occur and insure implant stability.

Objective: To evaluate decreasing the time for Baha loading from 12 weeks to 6 weeks.

Design: Retrospective review.

Participants: 26 adult patients who underwent Baha surgery over a 16-month period.

Methods: Patients underwent standard audiologic testing, and were found to be Baha candidates using standard clinical criteria. Indications included single-sided hearing loss due to Ménière's, acoustic neuroma, as well as idiopathic causes. There were also patients with conductive hearing loss due to chronic mastoiditis and otosclerosis. One patient had temporal bone cancer but no history of radiation. Patients were implanted with the standard 4mm titanium screw under general anesthesia and advised to follow up for fitting 6 weeks later. Patients had their processors loaded within a period of 5 to 9 weeks after surgery; average time was 6.5 weeks and patients with longer times were due to scheduling conflicts.

Interventions: Mastoidotomy with titanium implant.

Results: 3 patients had the minor complication of dermatitis which required debridement in 1 patient and topical medication in 2 others. These complications resolved completely with therapy. All patients had adequate osseointegration post-operatively, and no implants were lost.

Conclusions: In this study, the authors report good results with Baha sound processor loading at 6 weeks. They note that they have a limited number of patients and relatively short follow-up so it may be premature to recommend decreasing the time of processor loading to 6 weeks in all patients. The authors especially caution against early loading in children, patients with a history of radiation, or bone growth disorders.

Reviewer's Comments: Although the authors advise caution in decreasing the time between Baha implantation and loading, I would feel comfortable decreasing the healing time to 6 weeks in healthy adult populations. In addition to the results published in this manuscript, I know of colleagues who regularly do this without complications.

Additional Keywords: None

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Use of ultrasound is helpful in delineating anatomical components contributing to submental tissue excess in the aging neck and assist in effective surgical approach planning.

**Background:** The appearance of aging neck is secondary to the variable contribution from soft tissue senile ptosis and hypertrophy of muscle/adipose tissue.

**Objective:** To assess usefulness of high-frequency ultrasound in detailing the submental anatomy of patients with aging necks.

**Methods:** The extent of submental soft-tissue fullness was evaluated with ultrasound in 10 patients recruited from senior author's private practice. The relative contribution of subcutaneous fat, subplatysmal fat, and digastric muscle bulk to submental fullness were assessed objectively. The extent of subplatysmal fat pseudoherniation beyond the digastric muscle borders was also measured.

**Results:** The contribution of various anatomical components to observed submental soft-tissue fullness was clearly visualized on ultrasound evaluation. Components include subcutaneous and subplatysmal fat compartments as well as the bulk of the digastric muscles. Among patients, subplatysmal fat hypertrophy was observed in 5 and digastric muscle hypertrophy was seen in 1. Authors believe that these findings could not have been accurately predicted based on physical examination findings alone.

**Conclusions:** Use of ultrasound allows accurate evaluation of the cause of submental fullness associated with aging. This is particularly useful when subplatysmal fat pseudoherniation and digastric muscle hypertrophy are present, since these findings are difficult to appreciate on physical exam alone. The information obtained can be helpful in determining whether a closed submentoplasty approach is sufficient or if an open approach is necessary.

**Reviewer's Comments:** Blunting of the cervicomental angle secondary to submental soft tissue descent is a hallmark of the aging neck. The submentoplasty approach needed to establish a youthful-appearing neck contour, open or closed, is not always apparent based on physical exam findings alone. This is particularly true in patients with a heavy neck. If the soft tissue fullness is primarily due to subcutaneous fat hypertrophy, then a closed approach is likely to be sufficient. However, in cases where subplatysmal fat pseudoherniation or digastric muscle hypertrophy is present, an open submentoplasty approach may be warranted. Use of non-invasive diagnostic means such as ultrasound can assist in surgical planning.

Additional Keywords: None

Print Tag: Refer to original journal article
Surgical Relief for Migraine Sufferers

Indications and Outcomes for Surgical Treatment of Patients With Chronic Migraine Headaches Caused by Occipital Neuralgia.

Ducic I, Hartmann EC, Larson EE;:
Plast Reconst Surg 2009; 123 (May): 1453-1461

In selected patients, surgical neurolysis of the greater occipital nerve appears to be a viable treatment option for chronic headaches associated with occipital neuralgia.

**Background:** Occipital neuralgia is a refractory headache syndrome characterized by recurrent headache episodes of moderate to severe intensity localized to the posterior scalp. Diagnostic criteria are controversial but patients are often noted to be tender to palpation over the occipital nerves and receive symptomatic relief with anesthetic block of the occipital nerves.

**Objective:** To analyze the management of occipital neuralgia through the largest reported series of surgical neurolysis of the greater occipital nerve.

**Design:** Retrospective analysis.

**Methods:** 206 surgical neurolysis or resection of the occipital nerves for the treatment of occipital neuralgia were reviewed. Inclusion criteria included tenderness on palpation over the greater occipital nerve or positive response to either nerve block or Botox. All patients had symptoms for ≥6 months. Majority of patients (92%) were treated with greater occipital nerve neurolysis by releasing the nerve within the trapezial tunnel. Remainder of patients were either treated with resection of the greater and lesser occipital nerves (6%) or lesser occipital nerve alone (2%). Treatment success was defined as ≥50% reduction in pain on a visual analogue scale. Minimum follow-up period was 12 months.

**Results:** Mean preoperative pain score was 7.9 and mean postoperative pain score was 1.9. Treatment success was seen in 80.5% of patients and 43.4% of patients received complete headache relief. Minor complication (incision cellulitis) was seen in 2 patients. Factors found to be correlated with treatment success include tenderness over the greater occipital nerve, relief of headache with nerve block or Botox, history of occipital trauma, and being under the care of neurologist or pain specialist preoperatively.

**Conclusions:** Surgical neurolysis of the greater occipital nerve appears to be an effective treatment for selected patients with occipital neuralgia.

**Reviewer's Comments:** This study demonstrates impressive treatment results with surgical neurolysis of the greater occipital nerve in the treatment of occipital neuralgia. However, the diagnosis of occipital neuralgia can be difficult and there is often overlap with other headache disorders. Hence, it is important to select patients carefully if surgical neurolysis is considered. Treatment response with nerve block and/or Botox should be assessed. Also consultation with neurologist or pain specialist may be considered.

Additional Keywords: None

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Inhaling Doesn't Matter When it Comes to Cancer Risk

Cannabis Use and Cancer of the Head and Neck: Case-Control Study.

Cannabis did not increase long-term risk of head and neck cancer, but the study had limited power.

**Background:** Head and neck cancer can strike anyone, but well known risk factors include tobacco and alcohol abuse. There have also been other risk factors such as working in the hardwood furniture manufacturing as a risk for nasopharyngeal cancer, and human papilloma virus being implicated in other types of head and neck cancer. Cannabis use has the potential to contribute to the risk of head and neck cancer, and some have argued the risk may be higher because it is usually smoked without a filter. Carcinogenic effects of cannabis smoke have also been shown in vitro and in animal models. Prior human studies of cannabis use and cancer have been limited to small case series and 5 case-control series which focus on either cannabis use or head and neck cancer.

**Objective:** To determine if cannabis smoking increases risk of head and neck cancer.

**Design:** Case control study.

**Participants:** 106 cases were identified from the New Zealand Cancer Registry and the database at the authors' hospital; 81 agreed to participate. Also, 493 approximately age-matched controls were contacted with 319 agreeing to participate.

**Methods:** Patients were aged ≤55 years and were diagnosed with head and neck cancer within the past 5 years. Subjects underwent face-to-face interviews in which information about demographics, smoking history, drug abuse, diet, occupation, income, education, etc was collected. Cannabis smokers were asked about amount, frequency, age of onset, and duration.

**Results:** Effect of age was not studied. Males had an increased risk, and risk of those earning <$25,000 per year was 5 times that of those making >$70,000. Not surprisingly, tobacco smoking also increased the risk of head and neck cancer. Mean duration of cannabis use was 10.5 years among controls and 25 years among those with cancer. This suggests a 4% increased risk of head and neck cancer for each year of cannabis exposure. However, use of cannabis was not significant as an independent factor once smoking, alcohol consumption, and income were considered.

**Conclusions:** This population-based study did not find significant increase in head and neck cancer risk with cannabis use.

**Reviewer's Comments:** As this paper points out, there is already some evidence tying cannabis use to cancer. Although this study found much more cannabis use in the cancer population when compared with controls, it was not statistically significant. It is likely that a larger study would find a statistical difference.

Additional Keywords: None

Print Tag: Refer to original journal article
Treating Tuberculous Mastoiditis With Surgery

Role of Surgery in Tuberculous Mastoiditis.

Medical treatment with chemotherapy is the management of choice, although incision and drainage of post-auricular abscess can be performed.

**Background:** Tuberculosis of the middle ear is now uncommon, but still occasionally encountered by otolaryngologists. This was not the case a century ago when half of infants with otitis media had tuberculous etiology. When tuberculous otomastoiditis (TOM) is found it is not controversial that medical treatment is required. The role and indications for surgical treatment of TOM remains somewhat controversial.

**Objective:** To determine the role and indications for surgery in TOM.

**Design:** Retrospective review.

**Participants:** 43 patients with TOM diagnosed over a 6-year period.

**Methods:** All patients had otorrhea which was <6 months in 80%. Bilateral disease was present in 11 patients. All patients had a tympanic perforation; pale granulation tissue was present in the external auditory canal in 39 patients. In 40 patients chest radiograph was suggestive of pulmonary tuberculosis. Histology confirmed TOM in 42 patients. Patients were divided into 3 groups: (1) cortical mastoidectomy; (2) incision and drainage of abscess; and (3) no surgery. All groups were give chemotherapy consisting of rifampin, isoniazid, pyranzinamine, and ethambutol.

**Interventions:** Chemotherapy with or without surgery.

**Results:** Otorrhea and granulation tissue resolved in all patients in an average of 2 months with a range of 1 to 5 months. Facial nerve palsy was mostly present in children. In non-operated ears facial nerve palsy resolved in 10 of 11 patients. In the operated ears, 4 of 5 patients had resolution of facial nerve palsy. Both patients who did not recover facial nerve function waited ≥2 months prior to starting therapy.

**Conclusions:** The prognosis of facial palsy does not change with surgery in TOM. Mastoidectomy can help confirm diagnosis but does not change the prognosis, which suggests it is unnecessary.

**Reviewer’s Comments:** I sought to review a paper on the indication for surgery treatment in TOM. In recent papers on this topic, many tend to focus on a small number of cases, or atypical presentations. This paper is now 18 years old, but was still the best I was able to find on this topic. I think most otolaryngologists would open a mastoid in a patient with TOM especially if acute facial paralysis were present, but this paper provides good evidence that it is of no benefit. In the United States population, the problem that arises is that the diagnosis of TOM is often difficult to make because it is a rare disease. Although the incidence of pulmonary tuberculosis in this study was high, the incidence is much lower in developed countries, which further makes the diagnosis difficult. It is also unlikely that most would wait for culture results before opening a mastoid in a patient with an acute facial paralysis.

Additional Keywords: None

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Management of intracranial hemangiopericytomas is challenging, but complete tumor resection can allow symptom free survival.

**Background:** Hemangiopericytomas (HPC) are rare tumors that originate from the pericytes of Zimmerman. When occurring inside the cranium, they are difficult to classify because some consider them a variant of meningioma, which they can resemble more closely than peripheral HPC. Unlike meningiomas, they can be malignant and often metastasize. They are thought to be more common in males, but account for <1% of intracranial tumors.

**Objective:** To review the University of California at San Francisco (UCSF) clinical experience with temporal fossa HPC.

**Design:** Retrospective review.

**Participants:** 4 men and 1 woman with HPC of the temporal fossa treated from 1995 to 2008.

**Methods:** Patient age ranged from 13 to 62 years, and duration of follow up was 8 to 153 months. Extent of tumor was assessed with MRI. All patients underwent preoperative embolization. Gross total resection occurred in 2 of 5 patients. Of patients, 3 had postoperative radiotherapy. Diagnosis was histologically confirmed in all cases. Outcomes were assessed by evaluating for recurrent disease and if the patient had no evidence of disease, alive with disease, or died of disease.

**Interventions:** Surgical resection after embolization.

**Results:** Headache was the most common presenting symptom. Other less common symptoms were fatigue, nausea, vomiting, dizziness, blurred vision, dysphagia, personality change, obtundation, numbness, ptosis, muscle atrophy, and gaze palsy. Of patients, 1 died of disease 3 years after diagnosis. This patient had an initial subtotal resection followed by radiation. The tumor recurred and was treated with a revision surgery and brachytherapy. Of patients, 2 patients were alive with disease. Both patients presented with large tumors (one 5.7cm in maximum dimension and the other 3.9cm) and had subtotal resections. Of patients, 1 also had radiation. Both of these patients have been followed for over 6 years. Of patients, 2 had no evidence of disease, and 1 had a 7cm which was initially resected with postoperative radiation. He had a recurrent tumor 10 months later with liver metastasis, which were treated with further surgery and radiation. The other patient had a successful resection which was followed by radiation.

**Conclusions:** Patients who had complete resections are less likely to have recurrence. The value of postoperative radiation is uncertain. Long-term follow-up is required as recurrence occurred as late as 52 months. Across series, 5-year survival ranges from 60 to 85%.

**Reviewer’s Comments:** These results demonstrate that HPC has a worse prognosis than meningioma, but better than most intracranial tumors which have the potential for metastasis. Based on this data, it is not clear to me that complete resection is needed if it is at the expense of neurological deficits since 3 patients in this series who survived >5 years had subtotal resections.

Additional Keywords: None

Print Tag: Refer to original journal article
Although no significant effect of intratympanic dexamethasone infusion was found in this population, there was a tendency toward hearing improvement.

**Background:** Idiopathic sudden sensorineural hearing loss (SSNHL) is a condition which many otolaryngologists encounter frequently. The consensus is now clear that these patients need to be treated with steroids as quickly as possible. The method for steroid delivery is most commonly by either an intratympanic or systemic route. There is no consensus on how steroids should be delivered, but oral steroids are often used.

**Objective:** To determine the safety and efficacy of continuous intratympanic dexamethasone delivered to the round window as a salvage therapy after failed oral steroids.

**Design:** Randomized, double-blind, placebo controlled trial.

**Participants:** Patients aged 18 to 75 years, unilateral SSNHL within 72 hours, hearing ≥50 dB for the full range of frequencies, insufficient improvement with systemic steroids (≥20 dB hearing loss remaining). Exclusions included conductive hearing loss, middle ear disease, and severe neurologic disease. Prior to inclusion, patients were treated with intravenous high dose prednisone (250 mg/d) for 3 days followed by a taper. Randomized into the study were 23 patients.

**Methods:** Patients received either intratympanic dexamethasone or placebo via an implanted catheter for 14 days. Placebo patients who did not recover were given the option of receiving therapy for an additional 14 days after the trial ended.

**Interventions:** Implanted round window catheter delivery of dexamethasone or placebo.

**Results:** Treatment group had better outcomes than placebo group—they had improved speech discrimination and better pure tone hearing. However, none of these reached the threshold for statistical significance. These differences became smaller after the placebo group was given therapy and overall outcome for pure tone averages and speech discrimination was similar. It is possible that a larger group would have yielded significant results. The authors mention that recruitment was difficult because patients were reluctant to undergo an invasive procedure.

**Conclusions:** There was a tendency towards hearing improvement after implanted round window catheter delivery of dexamethasone but the effect was not significant.

**Reviewer’s Comments:** It is disappointing that the authors did not find a significant effect of this therapy and I wonder if it is a sample size issue as they suggest. For a study of SSNHL, 20 patients is a very small number. It has been claimed that there is a significant effect of intratympanic dexamethasone which would likely be more accepted by patients as it does not require an implanted catheter. Given these results, I would probably offer these patients a series of intratympanic dexamethasone infusions rather than the continuous infusion described here.