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Steven M. Parnes, MD

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Vital Topic

Rhinogenic Headache

Thorough evaluation of patients with headaches will help avoid unnecessary treatment strategies

By Michael Setzen, MD

The impact of headache in America is tremendous. Seventy percent to 80% of the population suffer with headache at one time or another, with an annual expenditure of \$50 billion in health care costs per year, and it is responsible for about 1% of all physician and ER visits.

Interestingly, 30 million Americans suffer from migraine, 37 million Americans suffer from rhinosinusitis, and a significant proportion of these patients with headache remain undiagnosed partly due to the fact that they may have either migraine or an undiagnosed nasal cause for their headache.

Who comes to the otolaryngologist for headache consultation?

There are three scenarios in which this may happen. The first scenario is the patient coming to the otolaryngologist complaining of a sinus headache. Many patients believe that all headaches in the region of the sinuses are due to sinusitis, and it is important that they do see the

otolaryngologist so that an examination of the nose can be performed to determine whether this is indeed a sinus headache or otherwise. The second scenario is the patient who comes to an otolaryngologist with headache unresponsive to all other treatment, especially

having undergone extensive neurologic therapy without resolution of the headache. It is extremely important for the otolaryngologist to see this patient, as indeed the headache may be due to the nose. The third situation in which a patient comes to the otolaryngologist is the patient complaining of nasal problems such as nasal congestion or nasal discharge together with headache. Once

again, it is important for the otolaryngologist to evaluate the nose and determine whether this is indeed headache due to the nose or not.

Eighty-five percent of all headaches are due to tension headache, 10% are due to

History, examination, and nasal endoscopy including computer tomography of the sinuses are essential in determining whether or not the cause of headache is rhinogenic. If a diagnosis of rhinogenic headache is made, then firstly aggressive medical therapy with appropriate referral to a neurologist is indicated, before any surgical therapy is warranted.

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EDITOR-IN-CHIEF

Steven M. Parnes, MD
Professor and Head
Division of Otolaryngology
Albany Medical Center
Albany, NY

REVIEWERS

Beryllin J. Ferguson, MD
Assistant Professor
Department of Otolaryngology
University of Pittsburgh School of Medicine
Pittsburgh, PA

Julie L. Goldman, MD
Louisville, KY

Cliff A. Megerian, MD, FACS
Associate Professor and Director of Otolaryngology & Neurotology
Case Western Reserve University
University Hospitals of Cleveland
Cleveland, OH

Joel Sercarz, MD
Division of Head and Neck Surgery
UCLA School of Medicine
Los Angeles, CA

John F. Stanievich, MD
Pediatric Otolaryngology
Buffalo, NY

GUEST

Michael Setzen, MD
Clinical Assistant Professor
Otolaryngology
NYU School of Medicine
Senior Clinical Attending
North Shore University Hospital
Manhasset, NY

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Intended Audience: Otolaryngologists, head and neck surgeons and others interested in otolaryngology and head and neck surgery.

Educational Objectives: This activity is designed to provide the participant with a regular overview of the most current, clinically useful information available in the monthly journal literature covering strategies and advances in the diagnosis and treatment of ear, nose and throat disorders and head and neck surgical diseases.

Controversies, advantages and disadvantages of diagnosis and treatment plans are emphasized.

After completing each issue's activity, the participant is expected to have a working familiarity with the most clinically important information and perspectives presented.

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Cliff A. Megerian, MD	Alcon, Curis, Daiichi, Anspach, Medtronic-Xomed	Grant Res. Supp.
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migraine, and only 5% are due to inflammatory disorders such as sinusitis. So why do so many people think that they have a sinus headache? This is due primarily to the tremendous media blitz that has taken place over the years by the pharmaceutical companies whereby they let it be thought that all headaches in the region of the eyes are due to the sinuses and that one must take an over-the-counter sinus medicine to alleviate the headache.

Sinus pain is due to inflammation, and the pain is usually due to irritation of nerve endings in particular around the sinus ostia or turbinates while the interior of the sinuses are less sensitive. Chronic sinusitis, on the other hand, is not a common cause of headache unless it develops into an acute sinusitis.

Sinus headache is so important to the otolaryngologist that the February 1999 AAO—HNS *Bulletin* lead article was called "Got sinus pain? So do 35 million Americans." This was part of the Sinus Pain Awareness month in which was quoted the fact that 11.9 million office-based doctor visits per year are due to sinus headache or pain, accounting for 645,000 ER visits. Any pain in the head and neck stimulating the trigeminal nucleus can cause referred pain along the ophthalmic and maxillary branches of the trigeminal nerves causing referred pain in the sinus location.

What are the rhinologic causes of headache?

The rhinologic causes of headache are two-fold. The first is acute rhinosinusitis, be it frontal, ethmoid, maxillary, or sphenoid, and the second is any anatomic variations within the nose. These anatomic variations or anatomical abnormalities can cause headache in and of themselves or as a result of causing sinusitis because of blockage of the osteomeatal complex. The anatomic variations therefore causing headache are the following: septal deviations, in particular a spur which may contact either the middle or inferior turbinate (this is the most common cause of rhinogenic headache); middle turbinate abnormalities, in particular concha bullosa, a paradoxically bent

middle turbinate, or a hypertrophied middle turbinate (of these, concha bullosa is the most common); a prominent ethmoid bulla, in particular if there is any contact area; aeger nasi cells; and an abnormally bent uncinat process. Any combination of the above or all of the above may cause headache, especially if contact points are noted.

Review of the literature confirming headache and its association with the nose

In 1988, Stammberger and Wolf reviewed 100 patients with rhinosinusitis and found that 48% of these patients complained of headache (Stammberger H, Wolf G: Headaches and sinus disease: The endoscopic approach. *Ann Otol Rhinol Laryngol* 1988; Sept–Oct 134: 3–23). In 1994, Salman and Rebeiz evaluated 207 patients with chronic rhinosinusitis and found that 69% of patients complained of headache (Salman SD, Rebeiz EE: Sinusitis and headache. *J Med Liban* 1994; 42: 200–202).

In 1997, Acquadro, et al, evaluated post-endoscopic sinus surgery patients with sinusitis (Acquadro MA, Salman SD, Joseph M: Analysis of pain and endoscopic sinus surgery for sinusitis. *Ann Otol Rhinol Laryngol* 1997; 106: 305–309). They evaluated 146 patients with a minimum follow-up of 6–12 months. Of these patients, 11.8% complained of headache and following surgery, 56% had no pain, 29% were better, 6% were the same, and 2% were worse.

Three articles support septoplasty for nasal congestion and relief of headaches. First, Schonsted-Madsen in 1984 evaluated 157 patients who underwent septoplasty with a 60% incidence of relief (Schonsted-Madsen U, Stoksted P, et al: Chronic headache related to nasal obstruction. *J Laryngol Otol* 1986; 100 [2]: 165–70). Secondly, in 1994, Salman and Rebeiz evaluated a group of 55 patients who underwent septoplasty with 64% relief in this study. Thirdly, in 1995, Low and Willatt evaluated 50 patients who had 64% relief following septoplasty (Low WK, Willatt DJ: Headaches associated with nasal obstruction due to deviated nasal septum. *Headache* 1995; 35 [7]: 404–6). Morgenstein and Krieger in 1980 evaluated 19 patients with middle turbinate headache or four-finger headache syndrome (Morgenstein KM, Krieger MK: Experiences in middle turbinectomy. *Laryngoscope* 1980; 90: 1596–1603). Five had unilateral endoscopic sinus surgery, 14 had bilateral endoscopic surgery, and 12 had con-

current septoplasty. Of the 19, 17 had resolution of their headache following surgery.

Goldsmith, et al, in 1993 discussed middle turbinate headache (Goldsmith AJ, Zahtz GD, et al: Middle turbinate headache syndrome. *Am J Rhinol* 1993; 7 [1]: 17–23). They evaluated eight patients with a follow-up of 10.8 months. These patients complained of fluctuating periorbital headache with nasal congestion. On examination, seven of these patients had concha bullosa on one side and one patient had concha bullosa on both sides. Two patients underwent medical therapy and were asymptomatic, and six patients underwent surgery. Five of these patients were asymptomatic following surgery, and one patient had reduced frequency of their headaches following surgery.

Parsons and Batra in 1998 discussed contact point headaches (Parsons DS, Batra PS: Functional endoscopic sinus surgical outcomes for contact point headaches. *Laryngoscope* 1998; 108: 696–702). Their inclusion criteria included a history of chronic headache, a contact point on examination, and no other identified cause. They all underwent turbinoplasty. They evaluated 34 patients with a mean postoperative follow-up of 13.9 months. 91% of these patients had decreased intensity of their headaches postoperatively and 85% had decreased frequency of their headaches postoperatively.

In 2002, Kunachak noted that 55 patients who underwent middle turbinate lateralization had complete resolution of their headache in 87% of cases with a mean follow-up of 50 months (Kunachak S: Middle turbinate lateralization: A simple treatment for rhinologic headache. *Laryngoscope* 2002 May; 112 [5]: 870–2).

Dean Clerico in 1994 evaluated 10 patients with intractable migraine, cluster, or tension headache who had no nasal symptoms but who had CT or nasal endoscopic abnormalities (Clerico DM, Fieldman R: Referred headache of rhinogenic origin in the absence of sinusitis. *Headache* 1994; 34: 226–229). All of these patients improved after medical and/or surgical therapy. Of course, Sluder in 1927 was the first one to present the issue of sphenopalatine neuralgia causing headache.

How do we diagnose rhinogenic headache?

A thorough history, complete nasal endoscopy, and CT of the nose and sinuses are

mandatory to make a diagnosis. This history must include elicitation of nasal congestion, postnasal drip, any facial pain, pressure, dental pain, anosmia, fever, cough, fatigue, ear fullness or pressure, precipitating factors causing the headache (head movement, stress, or cold weather), whether or not any consultation to a neurologist, allergist, or TMJ specialist has been performed, and whether or not therapy by these specialists has failed to overcome their headache.

Specific to the headache, the history must include its location and duration, any precipitating factors, including the possibility of an aura (such as flashing lights), whether or not stress, weather, allergy, or head movement precipitates the headache, any relieving factors, and any other associated nasal symptoms as discussed above.

The American Academy of Otolaryngology—Head and Neck Surgery in its classification of sinusitis (Lanza DC, Kennedy DW: *Adult rhinosinusitis defined. Otolaryngol Head Neck Surg* 1997; 117: S1–S7) notes that headache is a minor symptom of sinusitis but that facial pain is a major symptom. The International Headache Society concluded

that acute sinusitis can be a cause of headache but that it is a minor cause unlike migraine, which is a more significant and more common cause of headache.

Common causes of headache

In order to evaluate headache, the otolaryngologist must have knowledge of the common causes of headache.

Migraine

The clinical features of migraine are as follows. Patients generally have at least five attacks per year, and these last anywhere from 4 to 72 hours. They are usually unilateral in location, pulsating in character, and of moderate to severe intensity. They can be aggravated by exertion and are usually associated with symptoms of nausea, vomiting, or photophobia. What is interesting is that migraine can present with some of the symptoms of sinusitis and this can be very confusing to both the patient and the physician. In particular, they may have nasal congestion, rhinorrhea, and pain, of course, in the region of the sinuses. Migraines are usually triggered by stress, fatigue, barometric pressure changes, and sometimes even caffeine or fasting.

Tension headache

Tension headache, on the other hand, presents as a band-like pain which may be diffuse. It is of moderate intensity, not disabling, not aggravated by activity, and precipitated by stress or anxiety.

Rebound headache

Rebound headache occurs with abstinence of caffeine or barbiturates.

TMJ syndrome

TMJ syndrome is well-known to the otolaryngologist and obviously presents with pain in the region of the temporomandibular joint with radiation of pain into the temporal area. It can be associated with limited or painful jaw movement and even tinnitus. Generally this occurs due to clenching, night bruxism, or gum chewing and may also be due to malocclusion or other dental problems.

Diagnosis and treatment

Following the history, a thorough ENT examination is essential with palpation of the sinuses to elicit tenderness, and a formal nasal endoscopy is essential as well.

During nasal endoscopy, a routine examination of the septum, turbinates, and osteomeatal complexes is carried out. Contact

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points or trigger points are looked for, in particular the presence of a septal spur abutting the middle or inferior turbinate, concha bullosa, retroverted middle turbinate, pus exuding from the osteomeatal complex, or any other anatomical abnormality as described above. Once a contact point is located, this area must be anesthetized thoroughly with either topical application of 4% Xylocaine or lidocaine, via spray or cotton ball, or injection into this location with 1% lidocaine or Xylocaine. Topical cocaine (4%) can be used as well. Topical vasoconstriction of the contact area is important as well.

Once the area has been anesthetized, the patient is asked if the headache improved. If the patient did not come in with a headache, then it is advisable to bring the patient back when he or she has a headache to anesthetize this area and to see whether or not there is resolution of the pain. If indeed there is resolution of the pain, then this area must be aggressively treated, medically first before any surgery is contemplated. A thorough evaluation of the nose via CT is critical as well, and once again, one will look for any septal deviations, in particular spurs with contact points with the middle or inferior turbinates, evidence of concha bullosa, inferior turbinate hypertrophy, osteomeatal complex obstruction, or any evidence of sinusitis on CAT scan.

Therefore, following an extensive history, a thorough ENT examination with nasal endoscopy, and a review of the CT, a diagnosis can be made as to whether or not this facial pain and/or headache may be rhinogenic in nature. Once a diagnosis has been made, aggressive medical therapy is indicated. An appropriate referral to a neurologist or TMJ specialist is encouraged as well, in particular if there is no evidence of sinus disease on history, exam, or CT and especially if there are no anatomical abnormalities.

The medical therapy will, of course, include analgesics, saline irrigation, steam, hot and cold compresses, antibiotics if sinusitis is noted, treatment of the allergy problem with antihistamines, steroid nasal sprays, and leukotriene inhibitors, and time.

If medical therapy fails, a lengthy discussion must ensue prior to any surgical intervention. Failed medical therapy should include an evaluation and treatment by the neurologist and possibly the TMJ specialist. Prior to surgery, a full discussion of risks, benefits, and alternatives is essential.

Surgery can then be performed to correct any or all of the anatomical variants that are felt to be the cause of the headache. If there is indeed a septal spur, then septoplasty should be performed in whatever manner one prefers, be it endoscopic removal of the spur, submucosal resection, or the traditional Cottle approach. Secondly, if concha bullosa is felt to be the etiology, then resection of the concha must be carried out. Surgery in the form of powered dissection, whereby the lateral wall of the middle turbinate is gently debrided and the medial wall preserved, can be performed. The concha can also be taken down by filleting open the center of the turbinate with a sickle knife and removing the lateral middle turbinate wall with polypectomy forceps or debrider or gently crushing the middle turbinate. Third is correction of any and all abnormalities that are felt to be responsible for the headache.

With respect to endoscopic sinus surgery, this too is extremely controversial, in particular if on CAT scan there is no evidence of sinus disease. A repeat CT is sometimes necessary since one CT is only a snapshot in time. If indeed there is evidence of sinus disease on CT, then the indications are more definite and obviously one needs to address the sinuses that are involved. If there is no evidence of sinus disease, then one should not operate on the sinuses unless there has been evidence of rhinosinusitis on history and exam. If one has determined that on history and exam there is sinusitis, then one can proceed with a limited endoscopic sinus procedure on the involved side (namely, an anterior ethmoid and maxillary sinus procedure at the most). One must encourage one's radiologist when reading a CT of the sinuses to note the presence of any and all anatomical variants, in particular septal deviation and spur, concha bullosa, and osteomeatal complex obstruction. It is extremely difficult from a reimbursement standpoint and especially in any litigation if this x-ray was read as "normal sinuses."

In conclusion, a discussion of the rhinogenic causes of headache is presented. History, examination, and nasal endoscopy including computer tomography of the sinuses are essential in determining whether or not the cause of headache is rhinogenic. If a diagnosis of rhinogenic headache is made, then firstly aggressive medical therapy with appropriate referral to a neurologist is indicated, before any surgical therapy is warranted. In this way, the patient's headache will not become your headache.