Chapter 26

Two Patients, Two Diagnoses, and Two Treatments!

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Case History I

A 53-year-old single unemployed woman consulted in February 2003 for headaches. She was not under regular medical care. She self-diagnosed sinus headaches and treated herself with steam inhalation, ibuprofen, and over-the-counter (OTC) sinus medicines with minimal relief. Her first severe headache occurred at age 13 years, and she recalled a severe throbbing headache accompanied by vomiting. In her late twenties, she had similar severe throbbing headaches, usually on a Monday, occurring once a week; rarely, she had to leave work and retire to bed at home. Codeine caused nausea and afforded no relief. She described her headaches as "cyclic" and she might be headache free for 2 months. She did not recognize any headache trigger.

For 6 months before the patient consulted, she took trazodone, prescribed by a psychiatrist for depression; she reported the depression was improved and she was sleeping better than she had for many years. The trazodone also helped her headaches; she reported only one severe headache, in the month before consulting, and she retired to bed for 36 hours. The more severe headaches were accompanied by nausea, sonophobia, and inability to function. She experienced milder headaches twice a week, and self-medicated with ibuprofen and nasal decongestants. The patient worked for her parents in their home, cooking and cleaning. Her father had suffered from severe headaches.

The patient scored 61 on the Headache Impact Test, 11 on the migraine disability assessment (MIDAS) questionnaire, 53 on the Zung Depression Inventory, indicating a moderate to high level of depression, and 23 on the Center for Epidemiologic Studies depression scale, confirming a high level of depression.

She weighed 150 pounds. Blood pressure was 96/64. Temperature was 98.4°F. She complained of mild right frontal headache during the examination. There was no tenderness of her scalp, face, or neck, but her shoulders were tender to light touch. Anterior rhinoscopy and oropharyngeal examinations were normal. She had no bruit over her head or neck and there were no abnormal neurologic signs.

Questions on Case I

Please read the questions, try to answer them, and reflect on your answers before reading the author's discussion.

- What investigations would you perform?
- What management strategy would you adopt?

Differential Diagnosis and Case I Discussion

In a recent review of headaches and sinus disease, I emphasized the complexity of establishing a diagnosis of sinus-related headache because of several factors. First, until recently, a widely accepted definition of "sinusitis" had not been established. In 1997, the American Academy of Otolaryngology–Head and Neck Surgery (AAO–HNS) Task Force published a consensus of working definitions for acute, subacute, and chronic rhinosinusitis. The task force identified *major* and *minor* clinical symptoms and signs that are required for diagnosis of adult rhinosinusitis (Table 26-1). This diagnosis requires at least *two* major factors, or *one* major and *two* minor factors. Anterior rhinoscopy identifying nasal purulence is the most significant finding on examination. Note that while facial pain and pressure are *major* factors, headache is considered a

Table 26-1. Factors Associated with the Diagnosis of Rhinosinusitis

Major Factors
Purulence in nasal cavity on examination
Facial pain/pressure/congestion/fullness*
Nasal obstruction/blockage/discharge/purulence
Fever (in acute rhinosinusitis only)
Hyposmia/anosmia
Minor Factors
Headache
Fever (all non-acute)
Halitosis
Fatigue
Dental pain
Cough
Ear pain/pressure/fullness

Adapted from Lanza DC and Kennedy DW, 1997.

*Facial pain/pressure alone does not constitute a suggestive history for rhinosinusitis in the absence of another major nasal symptom or sign.

minor factor, and there is no diagnostic value of headache characteristics or localization. However, the presence of facial pain accompanying headache is suspicious for sinus disease. It is important to note that the AAO-HNS criteria use headache as one of several symptoms and signs to diagnose a pathophysiologic disorder (ie, sinusitis), while the International Headache Society (IHS) system is looking for a specific pathophysiologic condition to explain the cause of a symptom (ie, headache). In a sense, these two classification systems are polar opposites.

The new IHS criteria for diagnosing sinus-related headache incorporate the AAO-HNS definitions to diagnose sinus-related headache. A second important point to remember is that, in cases where sinus headache is suspected, the clinical diagnosis can be confirmed by computed tomography (CT) imaging of the sinuses or by fiberoptic nasal endoscopy performed by an experienced otolaryngologist. Not only can CT imaging confirm sinusitis, but it can also identify nasal septal spurs, sinus polyps, and abnormalities of the turbinates such as concha bullosa, which can be the source of contact point headaches (Table 26-2). Also, the new IHS criteria to diagnosis sinus-related headache are important to know (Table 26-3).

Armed with this knowledge, this patient did not meet criteria for rhinosinusitis, but she has had migraine since her teenage years.

Barbanti and colleagues reported that 45% of migraine patients experience "neurovascular symptoms," such as lacrimation, rhinorrhea, and nasal congestion, during their migraine attacks. It is not surprising that many patients and, too often, physicians misinterpret these ocular and nasal symptoms as indicative of sinus inflammation, diagnosing sinus headaches when, in fact, the patient has migraine with autonomic symptoms. Lipton and colleagues reported that, among patients with migraine, but not diagnosed as such, 42% had been misdiagnosed by a physician as having "sinus headaches." Other studies have confirmed this frequent misdiagnosis of "sinus headache," which is often unrecognized migraine. Schreiber and colleagues confirmed that as many as 88% of headache sufferers who were self-described or physician-diagnosed as having "sinus headaches" met IHS criteria for migraine. Sixty-eight percent of these patients were dissatisfied with their usual treatment for "sinus headaches," including prescription and OTC drugs such as decongestants, antihistamines, and analgesics.

Ishkanian and colleagues recently completed a double-blind, placebo-controlled, multicenter study of 215 patients who had been treated for self-described or physician-diagnosed sinus headaches, but who met IHS criteria for migraine. Sixty-nine percent of these patients responded within 2 hours to treatment with sumatriptan compared to 43% who were treated with a placebo.

In summary, patients with migraine accompanied by nasal congestion, rhinorrhea, and lacrimation may masquerade as "sinus headaches." Cady and Schreiber described the neurophysiologic connections between the trigeminal vascular system and parasympathetic pathways in the brainstem that explain these autonomic signs that can occur as part of the migraine attack.

Effective treatment demands accurate and complete diagnosis. In addition to the easy confusion between migraine and sinus headache, this patient's headache condition was complicated by depression, a common comorbidity associated with migraine.

Management Strategies

I diagnosed migraine without aura, but with accompanying autonomic symptoms and comorbidity of depression. I did not believe any investigations were necessary. We discussed

Table 26-2. Criteria for Contact-Point Headaches

1.	History of chronic headache
2.	Lack of acute or chronic inflammatory findings on the ear, nose, and throat examination (anterior and posterior rhinoscopy, routine sinus radiography, or CT scan)
3.	Absence of any other obvious cause of headaches after a thorough evaluation by a neurologist, ophthalmologist, dentist, internist, and other related specialist
4.	Presence of contact points as documented by nasal endoscopy or CT scan or both
5.	Failure of medical therapy for headache
6.	Relief of headache after applying topical anesthesia to the contact points
7.	Contact points that still remain after mucosal decongestion

Adapted from Tosun F et al, 2000.

CT = computed tomography.

Table 26-3. International Headache Society Diagnostic Criteria for Rhinosinusitis

11.5 Headache attributed to rhinosinusitis

Coded elsewhere:
Sinus headaches

Diagnostic criteria
A. Frontal headache accompanied by pain in one or more regions of the face, ears, or teeth, and fulfilling criteria C and D
B. Clinical, nasal endoscopic, CT and/or MRI scans, and/or laboratory evidence of acute or acute-on-chronic rhinosinusitis*
C. Headache and facial pain develop simultaneously with onset or acute exacerbation of rhinosinusitis
D. Headache and/or facial pain resolve within 7 days after remission or successful treatment of acute or acute-on-chronic rhinosinusitis

Notes*:
1. Clinical evidence may include purulence in the nasal cavity, nasal obstruction, hyposmia/anosmia, and/or fever.
2. *Chronic sinusitis* is not validated as a cause of headache or facial pain unless relapsing into an acute stage.

Comments:
Other conditions that are often considered to induce headache are not sufficiently validated as causes of headache. These include deviation of nasal septum, hypertrophy of turbinates, atrophy of sinus membranes, and mucosal contact. The last, however, is defined in the appendix under A11.5.1 mucosal contact-point headache.
Migraine and tension-type headache are often confused with 11.5 headache attributed to rhinosinusitis, because of similarity in location of the headache. A group of patients can be identified who have all of the features of 1.1 migraine without aura, and additionally, concomitant clinical features such as facial pain, nasal congestion, and headache triggered by weather changes. None of these patients have purulent nasal discharge or other features diagnostic of acute rhinosinusitis. Therefore, it is necessary to differentiate 11.5 "headache attributed to rhinosinusitis" from so-called "sinus headaches," a commonly made but non-specific diagnosis. Most such cases fulfil the criteria for 1.1 migraine without aura, with headache either accompanied by prominent autonomic symptoms in the nose, or triggered by nasal changes.

Adapted from Headache Classification Subcommittee of the International Headache Society, 2004.

CT = computed tomography; MRI = magnetic resonance imaging.

the recent observations that migraine may masquerade as sinus headache and I gave her patient-oriented literature from the American Council for Headache Education (ACHE) about migraine, the link with depression, and how nasal congestion and fullness may lead to the misdiagnosis of sinus headache. Our headache nurse instructed the patient in keeping a headache calendar, searching for migraine triggers, and recording response to treatment. I prescribed a triptan and a tricyclic antidepressant.

One month later, the patient brought her headache calendar, which documented 11 headaches that month, but she was completely headache free the past week. She reported four migraine attacks in the past month which were severe enough to take the triptan; she obtained complete relief twice, had moderate relief once, and on a fourth time required two tablets for relief. She started a weight-reduction diet program and believed this may have helped reduce her migraine attacks. She also began seeing a counselor for stress management. I gave the patient samples of a different triptan and explained to her that she was not to mix triptans within 24 hours. The Headache Impact Test, MIDAS questionnaire, and Zung Depression Inventory will be repeated at her next visit.

Case History II

A 31-year-old homemaker and registered nurse consulted in February 2000 for headaches. She had a 4-year history of headaches that occurred 2 to 4 times per month. Many of her worst headaches were menstrual-related. Bitemporal headaches gradually progressed over 2 hours and were often relieved by acetaminophen. She described a pressure sensation, which became throbbing with her most severe headaches, accompanied by light and sound sensitivity, and she would retire to a dark quiet room. Sleep helped. The headaches lasted 4 to 12 hours.

Five days before consultation, she developed a throbbing, continuous left temporal headache unrelieved by acetaminophen. Throbbing intensified and was accompanied by left facial pain and nasal congestion when bending over. She experienced nausea, vomiting, and blurred vision the day before consultation. She had never experienced a headache that lasted this long, nor one that was strictly unilateral. Her last menses was 1 week earlier. She was anxious about her condition and asked if she might have had an aneurysm.

Review of systems, past history, and family history were unremarkable; there was no family history of headache or aneurysm. She rarely drank alcohol and did not smoke cigarettes.

The patient weighed 226 pounds. Blood pressure was 140/70. Temperature was 98.8°F. No bruit could be heard over her head or neck and there were no abnormal neurologic signs. There was no tenderness of her face, head, or neck.

Questions on Case II

Please read the questions, try to answer them, and reflect on your answers before reading the author's discussion.

- What would be your diagnosis and management strategy?

Diagnosis and Management Strategies

While in the office, the patient reported 50% improvement of her headache within 30 minutes after receiving subcutaneous injection of dihydroergotamine 1 mg plus trimethobenzamide 100 mg. The medicines caused her to feel mildly flushed.

Magnetic resonance (MR) brain imaging showed mucosal thickening of the left maxillary sinus but normal brain structures. The radiologist diagnosed acute left maxillary sinusitis.

She was treated with trimethoprim, and after 4 days, the headaches subsided.

One month later, the patient reported by telephone that she remained headache free and felt fine. I diagnosed 4 years of migraine with a superimposed new left temporal headache and facial pain resulting from left maxillary sinusitis, which improved under treatment with antibiotic.

Case II Discussion

This patient had a 4-year history of headaches characteristic of migraine that fulfilled the IHS criteria. However, the new acute headache, which she recognized as different from her established pattern, raised a "red flag" that a new, second condition should be suspected, and I requested MR brain imaging. I was not familiar with the recently published AAO-HNS system and criteria for diagnosis of rhinosinusitis at the time, but in retrospect, her presenting symptoms pointed to that diagnosis. She had two major factors; namely, facial pain and nasal obstruction. She also had headache, a minor factor (see Table 26-1).

MR imaging of the brain was normal, but the left maxillary sinusitis surprised me. The sinusitis was ipsilateral to her left-sided headache and facial pain, and I diagnosed acute sinusitis as the cause of her new headache. She responded to treatment with antibiotic and remained headache free 1 month later. So often, in retrospect, the diagnosis should have been easy.

Until I learned of the AAO-HNS criteria for diagnosis of rhinosinusitis, otoscopy and anterior rhinoscopy were not part of my routine neurologic examination. These examinations only take 1 minute, and should be incorporated into the examination of every patient with headaches.

Case Summary

These two cases illustrate how migraine may masquerade as "sinus headache," and vice versa. The recent observations that prominent autonomic nasal and ocular symptoms often accompany migraine are important to keep in mind. Patients are often reluctant to give up their long-held belief that they have "chronic sinus headaches," especially after having received allergy injections for several years and multiple courses of antibiotics and other treatment for "sinus headache." I find it useful to give these patients the ACHE newsletter, published by the American Headache Society, which explains these concepts in layman's terms. There is a powerful authority of the printed word from a respected advocacy group that can help educate a skeptical patient.

The second case illustrates that, just because this patient had migraine, she was not immune from a second condition.

Selected Readings

Barbanti P, Fabbrini M, Pesare M, Cerbo R. Neurovascular symptoms during migraine attacks (Platform P1-A10). Cephalalgia 2001;21:295.

Blumenthal HJ. Headache and sinus disease. Headache 2001;41:883–8.

Cady RK, Schreiber CP. Sinus headache or migraine? Considerations in making a differential diagnosis. Neurology 2002;58 Suppl 6:S10–4.

Cady RK, Schreiber CP, Cova R, et al. Self-described "sinus headache" in patients with clinician-diagnosed migraine headaches: sinus or migraine? (Platform S64.002). Neurology 2002;578:A496.

Headache Classification Subcommittee of the International Headache Society. The international classification of headache disorders: 2nd ed. Cephalalgia 2004;24 Suppl 1:1–160.

Ishkanian G, Blumenthal H, Powers C, et al. Sumatriptan is effective in migraine presenting as "sinus" headache: results of a randomized, double-blind, placebo-controlled study. Arch Intern Med 2004. [In press]

Lanza DC, Kennedy DW. Adult rhinosinusitis defined. Otolaryngol Head Neck Surg 1997;117(3 Pt 2):S1–7.

Lipton RB, Stewart WF, Diamond S, et al. Prevalence and burden of migraine in the United States: data from the American Migraine Study II. Headache 2001;41:646–57.

Lipton RB, Stewart WF, Liberman JN. Self-awareness of migraine: interpreting the labels that headache sufferers apply to their headaches. Neurology 2002;58:S21–6.

Schreiber CP, Hutchinson S, Powers C, Webster C. Migraine among patients with a history of self-reported or physician-diagnosed "sinus" headache: prevalence and effect of sumatriptan tablets. Arch Intern Med 2004. [In press]

Tosun F, Gerek M, Ozkaptan Y. Nasal surgery for contact point headaches. Headache 2000;40:237–40.

Editorial Comments

As a cause of headache and pain, "sinusitis" has historically been a common cause in the eyes of patients and many of their physicians for years. In retrospect, one cannot be too critical of such a diagnostic formulation, as location of headache or head pain "over the sinuses" allowed the association to make clinical sense. Furthermore, the role of autonomic symptoms in primary headache disorders was less appreciated in the past, and to some extent, is still a new learning issue for most doctors. Recent clinical revelations and understandings have allowed the clear recognition of migraine as a cause of many "sinus headaches,"

which opens up the door to better treatments. Nevertheless, this shift in thinking should not go too far, as outlined in these excellent cases by Dr. Blumenthal, since sometimes, the diagnosis is not migraine but is in fact "sinusitis," and even if the patient is a migraineur, "sinusitis" can still coexist. All headache diagnosticians should keep these cases in mind.

Final diagnosis:

Migraine and rhinosinusitis