Chapter 45

The Case of One Headache Disguised as Another

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Case History

A 28-year-old married male lawyer self-referred for evaluation of headaches. He has had headaches since adolescence and is currently having headaches 3 to 4 times a month. They typically begin with tightness and tension in the muscles of his neck. These symptoms intensify over 1 to 2 hours until eventually the pain migrates into the suboccipital and temporal portions of the head. The headaches are described as bilateral, although on occasion one side of the head is more painful than the other. The quality of the pain is a tight pressure inside his head that waxes and wanes between mild and moderate intensity. The pain is not aggravated by activity, and he adamantly maintains that he functions normally despite the headaches, although on occasion he has postponed "trivial" social or family responsibilities. The muscles in his temples and neck stay tender throughout the headache. He reports anorexia and, rarely, nausea late in the headache, but attributes the nausea to using multiple doses of over-the-counter (OTC) medication. He has never vomited with a headache. He denies photophobia and phonophobia, but acknowledges that if given the option he prefers a quiet environment during a headache. Typically, his headaches last 2 days, but they can resolve after the first day if he gets a good night's sleep.

He treats his headache with an OTC product containing acetaminophen, aspirin, and caffeine, and routinely initiates treatment early when the muscle tension begins in his neck. He repeats the medication every 3 to 4 hours while awake until the headache resolves. Altogether he takes 10 to 12 tablets of medication per headache. Even though the medication helps him function, only rarely does it terminate the headache. The medication makes the headache "bearable," yet it produces a case of "jitters," interferes with sleep, and on rare occasion, makes him nauseated. His current medication is more effective than numerous other OTC products he has tried in the past. He is seeking medical care at this time because the headaches are occurring more frequently, and he is afraid they may begin to interfere with his work performance. He is hoping there is a stronger nonsedating medication that can more effectively relieve his headaches. He is under increasing job stress, as he is being considered for partnership in his law firm.

He reports that either stress or let-down from stress is a major precipitant of his headaches. Also, skipping meals may be a factor, but he acknowledges that skipping meals more likely occurs when he is facing deadlines so he is unsure as to which trigger is more important.

He drinks one to two glasses of wine in the evening, does not use tobacco, consumes little caffeine, and exercises regularly, playing competitive racquetball 4 to 5 days a week. His sister has migraine, and when he was growing up, his mother had headaches that required bedrest.

The patient's review of systems is noncontributory, and his physical and neurologic examinations are normal.

Questions on the Case

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

- What are the diagnostic considerations for this patient?
- Is there further historic information or diagnostic testing required to clarify the diagnosis in this case?
- What therapeutic interventions would you consider for this patient?
- What goals of therapy would define successful treatment?
- What measures, if any, would you use to follow this patient over time?

Case Discussion

This case highlights how even straightforward uncomplicated patients can present headache histories that are not easily categorized into standard diagnostic taxonomy. This case underscores the clinical challenge often encountered in diagnostically separating migraine from tension-type headache. Taken at face value, the patient presents with a mild to moderate headache that is bilateral, nonthrobbing, and not aggravated with activity. The headaches are not associated with photophobia or phonophobia. He rarely experiences nausea, and when nausea occurs, he adamantly attributes it to his medication and not the headache. The headaches do not inhibit important functions. Consequently, from the historic description of the headaches, he would appear to have a diagnosis of episodic tension-type headache.

However, several "red flags" should be raised around the diagnosis of episodic tension-type headache in this patient. First of all, it is uncommon for patients to schedule an office visit because they experience only episodic tension-type headaches. This patient in particular does not appear to be an individual likely to seek medical assistance for insignificant complaints. Secondly, the symptoms he describes are those experienced while he is using medication, and he provides a history of using substantial quantities of medication simply to make his headaches "bearable." This implies that the medication is modulating the intensity of at least some of his symptoms and that the history we obtained may not accurately reflect the true symptomatology of his untreated headaches. This has further ramifications when one considers that migraine is associated with many symptoms beyond those utilized for diagnosis, such as cognitive difficulties or autonomic disruptions, and that these symptoms may be contributing to the impact of the headache but not its diagnosis. Finally, he treats his headache early presumably to avoid disability, but in doing so, he does not allow the underlying headache process to fully express itself. Again, this diminishes the accuracy of the clinical history.

Revisiting the Patient Interview

During the headache history, the patient was queried on headaches he had experienced where he was not able to treat or treat early. He reported that this rarely happened, but did recall an international business trip where he inadvertently packed his medication in his luggage and could not treat for nearly 6 hours. This headache was considerably more severe, throbbing, and aggravated by movement. He specifically recalled how turbulence encountered during the flight seemed to "jar his brain" with every bounce of the airplane. He was nauseated and felt at one time that he might vomit. He was aggravated by the sunlight entering the airplane windows and felt irritated by the volume of the public address system whenever an announcement was made. In fact, he thought for a while he had the flu.

Further Questions on the Case

- Does the description of this headache change your diagnostic considerations?
- What therapeutic efforts would you now consider?
- What assumptions are possible about his headaches, given the description of this untreated headache?

Diagnostic Discussion

The untreated headache described here meets symptom criteria for migraine without aura. The headache was moderate to severe, throbbing, and aggravated by activity. In addition, there were associated nausea, phonophobia, and photophobia. However, there was not a history of five previous attacks of similar headaches required to meet International Headache Society (IHS) criteria for migraine without aura. Thus, a formal diagnosis of IHS migraine was not possible.

However, the description of this headache suggests that this patient has a nervous system with the potential to express a migraine-like headache, and if we were to observe more headaches where treatment was delayed, then a diagnosis of migraine would be likely. It is now reasonable to assume that at least some of his headaches, if untreated, would achieve sufficient symptoms to qualify for an IHS migraine diagnosis. The frequency of the headaches that would evolve into IHS migraine if untreated remains unknown.

The academic approach to this dilemma would be to ask him to keep a symptom diary and monitor symptoms until the headache reaches full intensity before initiating treatment. While this would allow for a more complete diagnostic evaluation of his headache symptomatology, it might also result in him seeking headache care elsewhere.

A more pragmatic approach, and the approach utilized in this case, was to treat his headaches as migraine and evaluate the therapeutic outcome. Because he was not experiencing an abortive response to his OTC medication (or others he had tried in the past) and was seeking more effective relief of his headaches, he was prescribed an oral triptan. The rationale for this approach comes from the Spectrum Study, in which it was demonstrated that in a population of patients with variable presentations of headache including migraine, tension-type, and probable migraine (migrainous) headaches, all three headache presentations were responsive to sumatriptan when they occurred in the same individual. Consequently, he was prescribed 100 mg of sumatriptan and reevaluated 1 month later. He was advised to treat early in the headache

process for headaches that he felt could disrupt important function or were not likely to respond completely to his OTC medication.

After 1 month, at the time of his return visit, he had successfully aborted three headache attacks within 1 hour of initiating sumatriptan. Furthermore, he did not have recurrence of headache and was very satisfied with his treatment plan. He was advised to continue the treatment plan, restrict the use of all acute treatment medications to < 3 days per week, and schedule for a follow-up visit in 6 months. He was advised that his headaches were migraine and that if he began having more frequent headaches or if his headaches did not continue to be responsive to sumatriptan, then he should made an earlier appointment to return for reevaluation.

Overview of the Relationship between Migraine and Tension-type Headache

Differentiating migraine from tension-type headache can be challenging due to several factors. First, there is an overlap in the epidemiology, precipitating events, and symptom-based criteria used for diagnosis; second, self-treatment efforts may distort symptom expression of the underlying headache process; third, there is an overlap in the therapeutic response to pharmacologic intervention; and last, there is no diagnostic test to distinguish migraine from tension-type headache.

Diagnostic Perils and International Headache Society Diagnostic Criteria

The symptom-acquisition model represented by the IHS diagnostic criteria performed effectively in worldwide regulatory studies of triptan medications. In part, this success occurred because these studies required research participants to delay therapeutic intervention until the intensity of the headache had become moderate to severe. Delaying any intervention until this level of headache intensity had been reached allowed sufficient time for the migraine process to evolve and for diagnostic symptomatology for IHS migraine to be diagnosed. Outside of the clinical trial environment, headache sufferers rarely delay pharmacologic intervention until the headache becomes as severe as it will become, and consequently the histories of headache symptomatology reported by patients seeking medical evaluation are often influenced by their efforts to self-treat. This can lead to misdiagnosis.

The current IHS classification system separates migraine without aura and tension-type headache by the presence and quality of symptoms associated with a headache. The latitude for interpretation of these symptoms by both physician and patients may at times make diagnostic interpretation difficult. For example, if a headache begins as a dull unilateral headache but evolves into a moderate to severe bilateral headache, how then should the location of the headache be classified?

According to the IHS classification, tension headache is distinct from migraine in that there is no aura, vomiting, or aggravation of the headache by activity. Ironically, despite the belief that episodic tension-type headache is extremely common, few studies have generated evidence that definitively separates tension-type headache from migraine. Taxonomy efforts to further separate tension-type headache from migraine based on symptomatology have been recently proposed by the IHS nomenclature committee. In this new classification, tension-type headache becomes featureless and can have no associated symptoms. Whether this more restrictive definition of tension-type headache will truly define two separate clinical entities or simply create a larger "gray" area between the two extremes remains to be seen.

Another difficulty in separating migraine from tension-type headache is that the IHS criteria are designed to identify each attack of headache as being an independent event. They are not designed to classify people with headaches. In many ways, this is the antithesis of clinical practice, in which multiple primary headaches are observed and classified in the context of the patient's headache profile. In order to provide timely therapeutic intervention, the diagnosis of a specific developing headache needs to be realized before the headache is fully evolved in order to limit the potential for disability. In clinical practice, this is most often accomplished through assessing the pattern of headache activity rather than each independent episode of headache. This permits predicting rather than responding to treatment need. For example, if a patient experiences headaches that without effective intervention have a high probability of producing significant impairment, then based on this historic pattern, intervention is often initiated before formal diagnosis of the headache can be realized. Thus, treatment anticipates the progression of headache based on the history of previous headache activity and not necessarily on the actual experience that can potentially evolve if the headache remains untreated for significant periods of time.

The Headache Patient versus the Headache Attack

Many individuals with primary headache disorders frequently experience several unique presentations of their headaches. This was documented by the American Migraine Study II (AMSII). Epidemiologically, phone interviews of a random sample of the general population found that approximately 18% of women and 6% of men suffer with headaches that meet IHS criteria for migraine with or without aura within a 1-year time period. From a subanalysis of 1,604 participants in the AMSII who met

criteria for IHS migraine during the telephone interview and had received a physician diagnosis of their headache, they uniformly reported experiencing at least three different headache types: migraine, tension, and "sinus," regardless of the medical diagnosis they had received from their physician. Subsequent studies of subjects self-diagnosing their headaches as sinus have suggested that nearly 90% of these headaches can actually fulfill criteria for IHS migraine or probable migraine (migrainous) headache. These studies suggest that in the population of people with migraine, people experience many different phenotypic expressions of primary headaches and, in part, this may reflect the conundrum patients face selecting self or prescribed treatment.

In the Landmark study, primary-care providers asked patients diagnosed with primary headaches to keep a diary of up to six headache attacks subsequent to an office interview. These diaries were reviewed by a panel of headache experts, and 94% of patients seeking diagnosis for headaches experienced at least some headaches that met IHS diagnostic criteria for migraine or probable migraine. For those patients who were diagnosed by primary-care physicians as having nonmigraine headaches, the diary-reviewing panel of headache experts diagnosed 82% of these headaches as migraine or probable migraine.

The significance of these observations are amplified by findings in the earlier Spectrum study that demonstrated that IHS-defined migraine, probable migraine (migrainous), and tension-type headaches all responded to migraine-specific medication (sumatriptan), and implied that these IHS presentations of migraine may simply be different phenotypic expressions arising from a common pathophysiologic mechanism that underlies the primary headaches, at least in those individuals with some headaches that fulfilled IHS migraine. Further analysis of the Spectrum study data suggested that individuals with exclusively IHS tension-type headaches were difficult to recruit into the study, and that nearly one-third were ultimately reclassified as migraine or probable migraine (migrainous) attacks of headache after review of the symptom diaries.

Taken together, it is fair to conclude that patients seeking medical care for patterns of episodic headache are most likely having migraine. In addition to those headaches that fulfill criteria for migraine, these patients may also experience other nonmigraine headaches, but all these headaches respond to migraine-specific interventions. Finally, numerous factors including treatment efforts can modify the clinical symptomatology observed during a given episode of primary headache.

The Convergence Hypothesis

More recently, the Convergence Hypothesis was proposed by Cady and colleagues to correlate commonly observed phenotypic expression of primary headache into a unified pathophysiologic model (Figure 45-1). According to this model, the pathophysiologic mechanism described in migraine can evolve to express multiple clinical phenotypes of headache including IHS migraine, probable migraine (migrainous) headache, tension-type headache, and what is frequently diagnosed as "sinus" headache. The process of migraine begins when the susceptible nervous system is overwhelmed by environmental factors, both internal and external. These risk factors may be a combination of triggers, such as missing sleep, skipping meals, and the hormonal changes of menstruation. As the nervous system adjusts to the alterations imposed by the migraine-producing factors, various neurochemical changes occur. In 60 to 80% of migraineurs, these produce nonspecific but often disabling symptoms, called prodromal or premonitory symptoms. These premonitory symptoms include fatigue, food craving, alteration in mood, yawning, or fluid retention. A prodrome does not inevitably result in headache. If the nervous system recovers from the alteration of the migraine-inducing environment, then normal neurologic function is restored.

If, on the other hand, the neurochemical changes in the nervous system reach a critical threshold, then the migraine process progresses into the aura phase (perhaps more appropriately referred to as the neuronal phase). Approximately 15% of migraineurs experience this phase of migraine with the symptoms of an aura. Previously, auras were considered pathognomonic for migraine. However, in the newly proposed revisions to IHS criteria, there is a nonmigraine headache with aura classification (eg, tension-type headache with aura).

Without restoration of normal homeostatic mechanisms, the migraine process can continue to escalate and

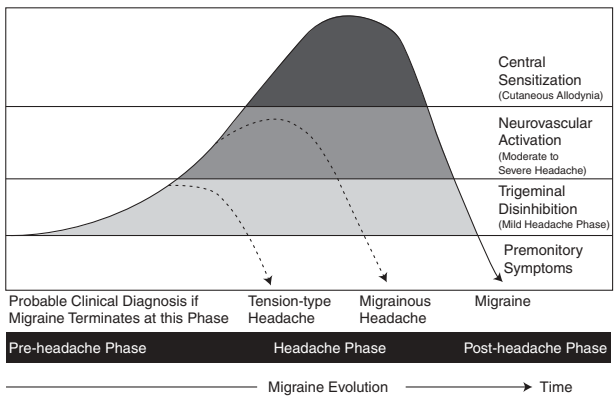

Figure 45-1. Acute migraine is a neurobiologic process and as such can be terminated at any phase of its evolution. Termination of this process at critical stages would be observed clinically as tension-type headache, probable migraine (migrainous), or IHS migraine.

induce activation of the trigeminovascular system. Once activated, the trigeminal afferents release a host of inflammatory peptides that cause vasodilatation and lower the sensory threshold of the trigeminal afferents. As the process is propagated along trigeminal vascular pathways, an abundance of sensory traffic bombards the second-order neurons in the trigeminal nucleus caudalis (TNC) of the brainstem. This increased sensory traffic breeches the inhibitory capacity of the TNC, which allows signals to progress to the thalamus and higher cortical centers. Eventually, this can result in inhibition of central pain processing, and migraine can progress to become a centrally maintained allodynic pain state.

The initial symptoms registered in conscious awareness are typically diffuse, mild, and determined by the peripheral inputs from the various branches of the trigeminal nerve that are involved in the migraine process. Diagnostically, these symptoms would likely constitute the diagnosis of tension-type headache. However, if the cascade of migraine-inducing events progresses and central sensitization occurs, then symptoms intensify, localize, and additional symptoms such as photophobia, phonophobia, and nausea can emerge. At this point, enough symptoms may emerge for a diagnosis of probable migraine (migrainous) or IHS migraine to be made clinically. Thus, the Convergence Hypothesis views primary headaches arising from a common pathophysiologic mechanism. Different phenotypic expressions are possible based on how far the process evolves. Several of these phenotypic expressions constitute IHS diagnostic categories.

Alternative Approaches to Migraine Recognition

IHS criteria have not been widely adopted in clinical practice. In large part, this is due to the difficulties in diagnostically distinguishing migraine, tension-type, and other primary headaches in the context of clinical practice. Consequently, several alternative schemes have been proposed for the clinical recognition of migraine. In 2000, the Primary Care Network suggested a four-question impact recognition tool for use in primary care. This questionnaire essentially defined a stable episodic pattern of headaches that interfered with work, family, or social function as migraine. In addition, the impact tool assesses the potential for medication overuse.

More recently, two additional clinical recognition schemes have been proposed that are based on clinical research. The Headache Screen 1 is a three-question recognition scheme that identified migraine in 77% of 3,034 patients included in the study. The proportion of migraine-diagnosed patients with the Headache Screen was similar among primary-care physicians as well as neurologists. Headache frequency did not impact the sensitivity of the screen. The three questions were as follows:

1. Do you have recurrent headaches that interfere with work, family, or social functions?
2. Do your headaches last at least 4 hours?
3. Have you had new or different headaches in the past 6 months?

Migraine diagnosis was suggested by an answer of "yes" to questions 1 and 2 and an answer of "no" to question 3.

Another diagnostic questionnaire, ID Migraine TM, utilizes three questions, and was validated by administration to 443 patients. Those who either had headaches that interfered with their lives or said they wanted to talk to their physician about headaches were referred to headache specialists who diagnosed them without knowing how they had answered the questionnaire. Of those referred to specialists, 93% were diagnosed by headache experts as suffering from migraine. The three questions were as follows:

1. Has a headache limited your activities for a day or more in the last 3 months?
2. Are you nauseated or sick to your stomach when you have a headache?
3. Does light bother you when you have a headache?

These brief recognition schemes are simple to use and rely on less interpretation than the diagnostic criteria of the IHS. In addition, they quickly define the individual who is not achieving an adequate response to therapy. Whether or not these impact-based recognition schemes will improve diagnostic sensitivity to migraine and other relevant primary headaches in clinical practice remains to be seen.

Conclusion

The academic debate over the relationship of migraine and tension-type headache will undoubtedly persist for many years. Yet, from a clinical perspective, there are several important issues to consider:

1. While episodic tension-type headache may be common in the general population, it is an unlikely reason for seeking medical consultation; in other words, most individuals who become headache patients have migraine.
2. Patients with migraine recognize that they have multiple presentations of primary headaches including migraine, tension, and "sinus."
3. Similar therapeutic responses to triptan medications are observed regardless of which phenotypic expression of primary headache a patient with migraine experiences.
4. Self- or physician-prescribed treatments can distort the clinical symptomatology observed during episodes of headache.

5. Individuals seeking medical consultation almost always will have tried and failed self-treatment efforts.

The diagnostic "gold standard" for primary headache disorders has historically been a detailed history and physical examination; however, given the changing dynamics of health care today, especially in primary care, it is rare for clinicians to have the time to provide this level of service. The development of simplified recognition tools may be able to assist clinicians in these efforts. In addition, to streamline diagnostic and therapeutics efforts, further research on the pathophysiologic relation of different presentations of primary headaches is needed.

Selected Readings

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Editorial Comments

A critical clinical issue facing headache clinicians is whether patients with migraine and a spectrum of presentations from episodic tension-type headache through probable migraine to migraine have one disorder with three presentations, two disorders, or even three. The IHS recommends that "patients receive a diagnosis according to the headache phenotypes that they currently present or that they have presented within the last year...Each distinct type of headache that the patient has must be separately diagnosed and coded...When a patient receives more than one diagnosis, these should be listed in the order of importance to the patient." Dr. Cady believes, based on the Spectrum study, that patients with migraine have different phenotypes but one major genotype; that is, they may present with the phenotype of a tension-type headache, but a particular primary headache in a migraine patient is likely still to be a migraine of low level, or altered by self-medication. This is a more parsimonious pathophysiologic explanation for what is seen clinically, and the fact that all three headache presentations, when they occur in the same patient, respond to sumatriptan, suggests that the Convergence Hypothesis has merit. Nevertheless, the true spectrum of migraine continues to expand, and this case does give the reader something to think about. Finally, the screening tools presented here could represent a way to improve diagnosis of migraine in primary care.

Final diagnosis:

The spectrum of migraine without aura: episodic tension-type headache and migraine without aura in the same patient