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When Is a Headache More Than “Just a Headache?”: The Secondary Headaches

While most head pain results from a primary headache disorder such as migraine, at times headache may be a symptom of a more serious, underlying disease. In this chapter, we will explore these “secondary” headaches in some detail, identifying their most common causes and the characteristics of the symptomatology that should compel one to seek immediate or elective medical attention.



Men also experience headaches.

When one develops chronic or recurring headache, and especially when the headache is disabling, it understandably may be difficult to accept that the pain does not reflect serious underlying disease. Within the vast mythology that envelops headache, one of the most enduring misperceptions is that headache often is indicative of a brain tumor. Oddly wedded to this ill-founded conviction is the dogma that headache is self-induced and perpetuated, somehow conjured up by the individual in an annoying attempt to control his/her environment. Joined together, these conflicting myths produce an oxymoron that, although untenable, has exerted a ma-

for influence on headache sufferers, those who live and work with them and those who treat them. (See Appendix 2 for a listing of common myths regarding headache generally and migraine in particular.)

The vast majority of headache is *primary* in origin, arising from a biologic process inherent to the individual, and relatively few acute, chronic, or recurrent headaches are *secondary* (i.e., stemming from structural or metabolic disease within the brain or body).

"Doctor, Do I Have a Brain Tumor?"

While brain tumor may be the greatest fear of many headache sufferers, it is decidedly unusual for a brain tumor to present as headache only, particularly in the absence of other neurologic symptoms and signs. Much more typically, the unfortunate individual who has developed a brain tumor will exhibit behavioral changes or experience seizures or focal neurologic symptoms such as limb weakness or impaired speech.

There is nothing especially distinctive about the headache induced by a brain tumor. Most people with pre-existing primary headache disorders who develop brain tumors note that whatever kind of headaches they previously experienced have become worse; their headaches are more frequent and more severe. If you have migraine and on that headache background develop a brain tumor, you usually get more migraines as a manifestation of your tumor. If you have a history of tension-type headaches and develop a brain tumor, you will get more tension-type headaches. Recall that the brain is not particularly sensitive to pain, and so headache is usually not a

prominent symptom of a brain tumor. Since the brain has few structures that sense pain, the tumor has to become very large before it causes headache. By that time, there usually are other abnormalities evident to the patient, to others or on the neurological examination.

Bottom line: Although brain tumors (and other serious diseases) rarely present with headache alone, it is wise to seek medical evaluation for headache of new onset or worsening of a preexisting headache disorder. Now before you get too anxious about the latter, realize that when one has a primary headache disorder (such as migraine), there will be good times and bad. This fluctuation in clinical severity is both natural and common, and the great majority of individuals who experience a change in the character of their headaches do so because of a change in an already established primary headache disorder not because they now have developed a brain tumor or other serious disease. At times the factors that provoke worsening of a primary headache disorder may be easily identified (egs, pregnancy, other significant hormonal change, chronically disrupted sleep, analgesic [*“pain-killer”*] overuse); many times, however, the destabilizing influence remains obscure. As the Mesopotamians noted: “Headache whose course like the dread wind-storm none knoweth.”

Sinus Headache

Another seemingly unshakeable myth is that chronic sinus disease is a common cause of chronic headache. Millions of dollars are spent each year in the United States on sinus medications, and many headache sufferers are

convinced that these medications will relieve or even cure their pain. As advertisements for sinus pills are pervasive in the media and invariably list symptoms that anyone with any kind of headache can relate to, it's not surprising that the individual with, say, undiagnosed migraine will turn to these readily available "solutions."

Many headache patients undergo sinus X-rays or scans as part of their diagnostic evaluation. The reports from these studies frequently mention "changes" indicative of chronic sinusitis, often confined to one side. As often as not, however, the changes observed are located on the side opposite to the headache, and rarely do these X-ray or scan "abnormalities" have any causal relationship to the patient's chronic head pain. Periodically we see people who submit to surgical procedures in hopes that such treatment of the "abnormalities" will relieve their headaches. Seldom does this help (for an especially poignant example of this, see Cluster Case, Chapter III).

There are two kinds of sinusitis: **acute** and **chronic**. The *acute* variety is just that: an acute illness, often with fever and exquisite tenderness over the involved sinus, typically with infected (i.e., yellow or green and thick) drainage coming from the nose. The pain generally is felt as a deep ache. Leaning forward commonly increases the pain, but this can be true of migraine and other types of headache as well. The sinuses feel blocked, but sinus congestion also may occur with migraine and, particularly, with cluster headache. In migraine and cluster, the sensation of fullness in the sinus is part of the headache, not its cause.

Perhaps the most important point to emphasize here is that no one walks around for months or years with acute sinusitis before seeking medical attention. This is,

again, an *acute* disorder that makes people very ill. If you indeed do have acute sinusitis, you should not simply take over-the-counter “sinus medicine”; at a minimum, you need medical attention and, quite likely, a course of antibiotic therapy.

Chronic sinusitis is far different. Although common, it rarely causes chronic headache, and it certainly never causes one to feel well for days and weeks, suddenly to become very ill for hours and then rapidly to regain wellness. If you walk down the aisles of large pharmacies, you will see for sale many products reputed to be effective for “sinus headaches,” and television emits a persistent drumbeat of advertisements recounting their virtues. These pills are composed of simple analgesics and decongestants. The analgesic component is nonspecifically effective for many types of pain (including migraine headache), and the decongestant component may affect the tone of blood vessels dilated consequent to a migraine attack. (Thus more directly reducing migrainous pain). Some relief from headache can result, and it is hardly surprising that you then are reinforced in your belief that you indeed have sinus headaches. “Sinus headache” is largely an American phenomenon, and those outside of this country rarely consider it a valid diagnosis. This may be an example of a largely factitious disorder produced by a culture awash in media-assisted marketing.

Do I Need New Glasses? Is It My Allergies?
Is It TMJ? Is It My Blood Pressure?

Eyestrain rarely causes severe headache. When it does, it is clearly related to reading or getting new glasses. As

with chronic sinus abnormalities, needing corrective lenses or a stronger prescription will not cause you to become very sick at irregular intervals and then be fine the rest of the time. If reading does clearly trigger your headaches, check with your eye doctor to see if corrective lenses are needed.

Everyone is allergic to something, and yet another misconception is that allergies are an important cause of headaches. If you have migraine, you might expect to see an increase in your migraines when you are in an allergic period, just as you might with any stress. But focusing the treatment of your headache problem on allergies is not likely to be fruitful. In Chapter V, we will discuss foods that can trigger migraines. These foods do not produce migraines on the basis of allergy, however, and allergy shots will not protect you against migraine.

Many people have, or believe they have, temporomandibular joint (TMJ) dysfunction as the cause of their headaches. The following case is typical of that disorder.

Case 2.1

A 23-year-old woman complains of pain in her left temple and in front of her left ear. She notes that if she chews, the pain becomes worse, and she has been eating soft foods. She has felt very stressed, and her sleep is disrupted. The pain is described as an ache, and she does not otherwise feel sick with this headache.

This is a syndrome that causes discomfort when you chew. There is a large muscle in the temples, the temporalis muscle, which can be in spasm. When you open your mouth, a click may be noted in or around the ear. Other

muscles in and around the mouth also may be involved. TMJ dysfunction does not always mean that the problem is arising from the joint. Often the joint dislocates as part of a tension-type headache, where adjacent muscles are exerting excessive pressure on the joint; often, people with this kind of headache grind their teeth or repeatedly clench their jaws while they sleep. Conversely, just as a flare-up of allergies may aggravate a migraineur's migraine, so may TMJ dysfunction lead to a migraine exacerbation.

Most of us have had TMJ problems from time to time; 75% of the population will have a TMJ disorder at some point in their lives. Often it will be precipitated by yawning widely or biting into a candy apple or a tough piece of meat; and usually the symptoms will abate within a few minutes or at most a day or so. There do exist a few poor souls, however, who develop this as a chronic problem; intraoral splints, a course of treatment with an antiinflammatory drug or both then may be helpful.

Some antiinflammatory medicines and a mild muscle relaxant may suffice as treatment for those with an acute TMJ disorder. If it becomes chronic, you need to see your dentist to determine whether there is a problem in the joint or whether there is something wrong with your bite. Occasionally your dentist may want you to wear an appliance to equilibrate your bite or at least keep you from grinding your teeth down. Periodically, surgical management is recommended. This should be reserved only for unusual situations where the diagnosis of TMJ dysfunction is certain and all other treatment approaches have been exhausted.

A common fallacy is that headaches commonly result from chronic high blood pressure (*hypertension*) and that one can predict the blood pressure level according to the presence or absence of headache. In fact, chronic hypertension rarely causes chronic headache, and even acute, severe elevations of blood pressure may not necessarily produce acute headache. If individuals rely on the presence of headache as an indicator of hypertension, this means that many people will not receive proper treatment for regulation of their blood pressure. The only sure way to know if your blood pressure is high is to have it measured. It is true, however, that acute, severe migraine headache commonly will cause an elevated blood pressure even in individuals who typically are normotensive.

When to Worry

As mentioned previously, migraine is the most common cause of recurrent, disabling headache, and the vast majority of patients who seek medical attention for recurrent headache indeed will have migraine; even in the emergency department (ED) setting, the majority of patients presenting with headache will have what is in essence a benign disorder, migraine. While migraine attacks generally begin with relatively mild head pain that may build over hours to become more severe and even excruciating, in some individuals the pain of migraine can begin acutely and with maximal intensity. This is termed “crash” migraine, and this migraine variant is the leading cause of what we refer to as **thunderclap headache**. The hallmark of thunderclap headache is that the

pain begins abruptly and is severe in intensity right from the onset; a typical patient description is “I felt like my head was hit by a baseball bat.”

While **crash migraine** may be the most common cause of thunderclap headache, a host of other conditions and diseases may produce this remarkable wallop of head pain (Table 2.I). Some of these, as with migraine, are “primary” in origin and do not reflect significant underlying neurologic or general physical disease. Two common examples are *benign exertional headache* and *benign sexual headache* / “explosive” type. The following two cases highlight the features of these personally alarming but fundamentally benign headache disorders.

Case 2.2

A 35-year-old female with a prior history of migraine with and without visual aura maintains an aggressive aerobic exercise program over a period of many years. One day, nearing the end of her typical six mile run and, as per usual, increasing her pace significantly over the last mile, she suddenly experiences an abrupt, severe headache that she describes as bilateral, throbbing and quite different from her typical migraine headaches. The headaches slowly resolve over a period of several hours.

Over the next three weeks, she experiences four more episodes of essentially identical headache, each occurring while she engages in intensive aerobic exercise.

Her past medical history is otherwise unremarkable. Her general and neurologic examinations are normal, and brain magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) demonstrate no evidence of brain aneurysm or other structural pathology. A lumbar

puncture yields normal cerebrospinal fluid, without evidence of recent brain bleeding. She is placed on a non-steroidal anti-inflammatory medication, indomethacin, and told to hydrate well before episodes of aerobic exercise.

She has no further episodes of exertional thunderclap headache, and the headaches do not recur when she stops indomethacin six months later.

Case 2.3

A 47-year-old male with no prior history of significant headache reports having experienced multiple episodes of thunderclap headache over the prior three months. Each time the headache occurs during sexual intercourse and either at or immediately prior to orgasm. The headaches are described as severe, often throbbing and generalized throughout the head. They tend to resolve entirely after an hour or less. He has begun to abstain from sex due to his fear that the headache will recur and perhaps precipitate a serious neurologic complication.

His general and neurologic examinations are normal. Brain MRI and MRA demonstrated no pathology. He, too, is placed on indomethacin, and his episodes of intercourse-related thunderclap headache cease entirely and do not recur when he stops indomethacin several months later.

Both of these patients experienced severe and personally alarming thunderclap headaches during physical exertion. The first case represents an example of benign exertional headache, and the second is quite characteristic of benign sexual headache/explosive type. Interestingly, both types of thunderclap headache tend to be quite responsive to treatment with an old-fashioned anti-

inflammatory medication, indomethacin. Such individuals (especially those with the latter condition) rank among our most grateful patients.

Thunderclap headache does not always connote such a benign origin or happy outcome. The most serious, acutely life-threatening cause of thunderclap headache is bleeding within the brain from a ruptured aneurysm (*subarachnoid hemorrhage*). These “Berry” aneurysms typically are present at birth but are seldom inherited; their presence is simply a matter of bad luck (rather than bad health or unfavorable genes). Most aneurysms lie quiescent within the brain throughout an individual’s lifetime, causing no symptoms and making no negative contribution to health or longevity. As the following case reflects, however, the unfortunate patient who does experience rupture of an aneurysm and consequent subarachnoid hemorrhage may suffer dire consequences.

Case 2.4

A 41-year-old female with no prior history of significant headache abruptly develops an “explosive” headache during orgasm. Two hours later in the emergency department (ED), her exam is normal; she complains of neck stiffness, but her neck is described as “supple”. Three nights later, she again develops an “explosive” headache during orgasm, and over the next 30 minutes, her level of consciousness progressively decreases. In the ED 1 hour after headache onset, she is comatose. Her brain computed tomography (CT) scan shows evidence of massive subarachnoid hemorrhage. Figure 2.1, an arteriogram demonstrates a large aneurysm that has ruptured (Figure 2.2). She dies 12 hours later.



Figure 2.1 A brain CT demonstrates blood within the fluid-filled spaces of the brain, indicative of subarachnoid hemorrhage from a ruptured aneurysm.

While this case is terrifying and raises several important clinical issues for patient and clinician alike, it again should be emphasized that the great majority of brain aneurysms will remain asymptomatic throughout



Figure 2.2 A brain arteriogram demonstrates a large congenital aneurysm at the tip of the basilar artery.

an individual's lifetime. Brain aneurysms are not uncommon; in the general population, approximately 1 in 20 people has a berry aneurysm. The risk of aneurysmal rupture and subarachnoid hemorrhage varies widely depending upon the aneurysm's size and location within the brain but averages about 2% per year. In other words, most individuals with a brain aneurysm will suffer no harm from its presence.

This last fact assumes particular significance when one recalls the frequency with which patients complain-

ing of chronic, recurrent headache are referred for brain imaging studies such as CT or MRI scans. If asymptomatic brain aneurysms are common in the general population and no less common in individuals with primary headache disorders such as migraine, then many of these scans will detect *incidental* aneurysms (or other abnormalities) that both may have no relationship to the patient's chronic headaches or, for that matter, any clinical relevance whatsoever. It is extraordinarily unusual for brain aneurysms to cause *chronic* headache, and the discovery of an asymptomatic aneurysm in a patient with migraine may lead to undue alarm and, worse, even an unnecessary surgical intervention.

Let's keep our eyes on the ball here. What is important to keep in mind is that thunderclap headache is a symptom which requires immediate medical attention . . . especially if it is the individual's first experience with such a headache. While subarachnoid hemorrhage *must* be excluded in that instance, the reassuring truth is that only the minority of patients with thunderclap headache will be found to have aneurysmal bleeding or another ominous source for their pain (see Table 2.1).

To rule out bleeding from an aneurysm or meningitis, a lumbar puncture (spinal tap) may be necessary. For reasons never clear to us, nothing strikes more fear in the heart of a headache sufferer than the mention of a spinal tap. Whenever a neurologist recommends a spinal tap, friends and families all share with that patient a story they heard of someone who had one of these and then became paralyzed. Other friends always want to share their understanding that this is the most painful thing you can ever do to a human being. We will confess that

Table 2.1 Thunderclap Headache: Common Causes

Serious

- subarachnoid hemorrhage (bleeding from a ruptured brain aneurysm)
- thrombosis (clotting) of a major vein within the brain
- hemorrhage or infarction (stroke) within the pituitary gland
- dissection (tearing) of the carotid or vertebral artery

Less serious

- cerebral spinal fluid leakage from a tear in the dura (lining of the central nervous system)
 - benign exertional headache
 - benign sexual headache/explosive type
 - “crash” migraine
-

spinal taps, like root canal, are not something you would independently solicit, but these tales of horror just are not justified. Under local anesthetic, the needle is placed well below the level where the spinal cord has ended, so no one can be paralyzed by this procedure. It just does not happen.

Spinal taps give us information we cannot obtain in other ways. We can measure the pressure of the spinal fluid, culture for bacteria and other organisms, and check for bleeding that might have been missed on a CTT scan (CTT scans detect most, but not all cases of subarachnoid hemorrhage).

There is one other problem with getting a spinal tap. Approximately 1 in 4 people get a spinal tap or **postlumbar puncture** headache. Being thin seems to predispose some people to developing this complication. This headache is certainly unpleasant, but easily distinguished from most others. If you get a postlumbar puncture headache, you note that when you are lying down it is gone.

However, it comes on again as soon as you stand up. It may be helpful to lie down for several hours after having a spinal tap and to drink a lot of liquids. It is a known complication of the test; it is not a sign that your doctor did anything wrong.

Ultimately, it is going to go away no matter what you do, but if it is not gone after a few days, you might consider getting an **epidural blood patch**. This is done by injecting a little of your own clotted blood into the site where you had the spinal tap; this commonly stops these headaches very quickly. Eventually, no matter what you do, postlumbar puncture headaches go away.

Sinus disease, as already explained, does not often cause headache. This is not a hard and fast rule, and a CTT scan or other evaluation of the sinuses is sometimes appropriate. Other infections, not only those of the sinuses, can cause headaches. In fact, an infection in any part of the body can cause headache simply through the mechanisms by which the body fights infections. Fever, itself, can cause headache. Some infections cause prominent headaches, such as Lyme disease, even if the infection itself is not in the nervous system. Among the most serious is an infection of the coverings of the brain and spinal cord called **meningitis**. Many different organisms can cause meningitis. Some are rapidly life threatening, others threatening over weeks and months; others, generally viruses, will go away without treatment.

The symptom of meningitis is a generalized headache that particularly involves the back of the head and can be associated with a stiff neck. Usually, but not always, you have a fever. The diagnosis is made with a spinal tap, and if your doctor suspects meningitis, there is no

substitute for this test. Anyone with a headache, stiff neck, and fever should be seen by a physician on an emergency basis.

When Else Should I Worry?

Studies of patients presenting to an ED with the chief complaint of headache have identified the following factors to be associated with a higher risk of secondary headache: severe headache of abrupt onset (ie, thunderclap headache), age greater than 55 years, pain located posteriorly (i.e., back of head and neck) and abnormalities present on physical examination. Of these risk factors, the last is by far the most potent.

As mentioned previously, a change in the characteristics of a chronic headache disorder in intensity, frequency, location, and so on, infrequently may indicate that the headache is secondary rather than primary in origin, but by far the most common cause for a change in headache character is simply a change in the patient's primary headache disorder itself. In many patients with migraine, the typical episodic form of the disorder may change such that the head pain experienced becomes more pervasive; patients so afflicted often develop daily, low intensity head pain that resembles chronic tension type headache, and superimposed upon this baseline pain they may continue to experience attacks of “typical” migraine.

This “transformation” of paroxysmal migraine into a chronic daily headache disorder remains something of a mystery to physicians and scientists. Many times the transformation is attributed to overuse of medications in-

tended for acute treatment of head pain (see Chapter 4), but in many cases such overuse is not present, or the daily headache persists even after the patient ceases to overuse.

Transformed (or “chronic”) migraine is common, afflicting as many as 1 in 50 individuals in the general population. While a change in headache character should prompt a visit to one’s health care provider, it is decidedly unusual for such change to reflect the presence of a brain tumor, chronic meningitis or another equally grim etiology.

There are some other serious conditions that cause headaches and require medical attention (Table 2.2)

Case 2.5

A 72-year-old woman develops headaches in the past month. They are located all over her head, and she describes aching of her shoulders, neck, and head. It has become painful to brush her hair, and she notes tenderness over her temples. She feels “just awful” and even has some weight loss and a low-grade fever. She notes that when she chews her jaw aches.

When someone over 50 years of age develops a new headache that is associated with tenderness of the scalp or temples, it needs emergent attention. This could represent temporal arteritis; an inflammation of arteries, which if untreated can lead to blindness in one out of three people. Usually people with temporal arteritis feel achy and generally awful. Often the scalp hurts even more when they are out in the cold weather. It is amazing how tender the scalp can become with this condition, and hair brushing can become quite an ordeal. Of-

Table 2.2 Headache Classification

Headache Type	Symptoms
Primary headache syndromes	
Migraine	May begin with a prodrome-depression, food cravings, euphoria, irritability, yawning, cold hands and feet. Sometimes auras: visual disturbances, numbness. Pain is pulsatile or aching, often one-sided, worsens with movement. Often associated with nausea, vomiting, light sensitivity, and sound sensitivity
Tension	Band-like pain on both sides of head, relieved by over-the counter medications and rest, often associated with a specific stress or a prolonged neck posture.
Cluster	Usually recur frequently during periods of 2 weeks to 2 months. Agonizing pain builds quickly; eye on affected side reddens and runs, clear liquid discharge from nose. Often start during sleep. Alcohol is a potent trigger.
Secondary headache syndromes	
Brain tumor	Headaches become more frequent and more severe. Substantial change in headache pattern.
Temporal arteritis	Sufferers are usually over 50. Tenderness of scalp or temples, achyness, chewing or speaking painful. Can often lead to blindness.
Idiopathic intracranial hypertension	Patients are usually obese women with irregular periods. Swelling of optic nerves can cause vision loss.
Malignant hypertension	Significant headache caused by severe elevation in blood pressure, modest increases in blood pressure do not cause headache
Subarachnoid hemorrhage	Sudden onset of intense pain in headache, like an explosion in the head.
Meningitis	Generalized headache involving back of head, often stiff neck, usually fever. Light and sound sensitivity prominent

ten, chewing food causes even more pain in the jaw or in the tongue. A simple blood test, an ESR (erythrocyte sedimentation rate), is performed. An abnormal ESR is highly suggestive of temporal arteritis. If temporal arteritis is suspected, a biopsy of the artery in the temple is indicated.

Case 2.6

A 22 year-old obese woman complains of headaches throughout her head over the past 6 weeks. Her periods have become irregular. She hears pounding noises in her head. The pain is worse in the morning when she arises and tends to get better as the day progresses, although there is some degree of pain throughout the day. Whenever she would cough, sneeze, or bear down to have a bowel movement, the pain worsens. Recently, she develops double vision.

There is another syndrome, called **pseudotumor cerebri** or **idiopathic intracranial hypertension** that we see periodically. Most people with this (but not all) are women, often overweight, and often with irregular periods. The description of these headaches resembles that of a brain tumor. Looking into the eyes with an ophthalmoscope, a swelling of the optic nerves called *papilledema*, is visible. A CTT or MRI scan will determine there is not a tumor. Next is a spinal tap to measure the pressure of the spinal fluid (which is very high in this condition) and make sure there is no infection around the brain. Usually medications are indicated to improve the headache and bring the spinal fluid pressure down. Aside from the headache, there is always the risk of vision loss with pseudotumor cerebri, so it is important to

accurately diagnose this problem. Surgical treatments to reduce the pressure in the brain are occasionally needed. Managing this problem requires a collaborative effort between you, your neurologist, and your ophthalmologist.

Most headaches occur around the eye. Most people who seek help for headaches have already been checked out by their eye doctor who tells them everything is fine. How can that be?

The nerves that supply almost everything that is sensitive to pain within the head also supply pain sensation to the eye. Because they share a nerve supply, most pains emanating from the head (including migraine and cluster headaches) are felt above, below and deep inside the eye. This is called **referred pain**. The same phenomenon can cause pain to often radiate down the left arm when one has a heart attack. So, is it always necessary to see your eye doctor if your headache is centered on the eye? Not if you have had your headaches for a while, your eyes are not red, and your vision seems fine. The exceptions to this rule are rare; so let your doctor decide if you really need that appointment.

Case 2.7

A 66-year-old man has a history of high blood pressure. When it is diagnosed a year ago, he has headaches that cease when the blood pressure is treated. As he feels fine, he stops his blood pressure medications. Since he has no return of his headaches, he feels satisfied that his blood pressure is fine.

A common fallacy is that you get headaches from high blood pressure and that you can even predict your blood pressure from your headache. There are several problems

with this First, it is not true. All but the most severe elevations of blood pressure are not associated with headache. That means many people are not being treated properly for increased blood pressure. The only way to know if your blood pressure is high is to have it taken. However, huge elevations in blood pressure, called **malignant hypertension**, can cause significant headache and are treated as a medical emergency.

Case 7

A 48-year-old man notes that over the past 3 weeks, whenever he has an orgasm, he develops a severe headache in the front of his head that comes on over seconds. The pain lasts several hours and is associated with some nausea and light sensitivity. He never has experienced headaches like this before and is afraid to have sex.

There are countless jokes with the punch line being “not tonight honey, I have a headache.” There is nothing funny about having headaches that come on with sexual activity. Sexually induced headaches are related to several other kinds of headaches that come on with exertion, including headaches that may arise from weightlifting or simply sneezing or coughing. Being at a high altitude seems to predispose to these headaches as well. Some people get severe headaches at the time of orgasm. Sometimes these come on quickly and are very reminiscent of those that occur with a ruptured aneurysm of the brain. Most of the time these orgasmic headaches are benign, but should always be checked out since it is not impossible that you have ruptured a cerebral aneurysm during sex. They are disabling but ultimately disappear with

treatment. Several medications are effective to prevent these attacks when taken prior to having sex. At other times, orgasm simply brings on a headache that is probably a tension headache and is usually easy to treat. The recent introduction of Viagra, Levitra, and Cialis to treat impotence in men has increased the number of men complaining of headaches with sexual intercourse. Headache is a common side effect of these drugs, probably because they can dilate arteries.

Seek Medical Attention If . . .

- thunderclap headache (**emergency!**).
- acute headache, fever, neck stiffness = rule out meningitis (**emergency!**).
- headache with persisting focal neurologic deficit (**emergency!**).
- change in character of previously stable headache disorder.
- age over 55/headache of new onset.

Focal neurologic deficit accompanying acute or chronic headache should raise concern for the presence of underlying disease involving the central nervous system. Typical focal deficits include numbness or weakness of a limb or one side of the face or body; difficulty with speech; impaired comprehension; and lack of coordination or balance. In a patient with migraine, it may be difficult to distinguish between benign aura symptoms that accompany some acute migraine headaches and neurologic symptoms that reflect another underlying disease process (eg, acute stroke). You can learn more about aura

symptoms in chapter III; for now, suffice it to say that even in an individual with a history of migraine and associated aura, any headache-associated acute, focal neurologic deficit that persists for more than one hour requires immediate medical attention.

Summary

Acute, recurrent or chronic headache occurring independent of any other neurologic or systemic symptoms rarely is indicative of serious underlying disease. If one experiences recurrent attacks of headache that at times is severe and disabling, in the overwhelming majority of cases the cause is migraine. Table 2.2 lists the most compelling circumstances that call for medical evaluation of headache. Thunderclap headache, prominent headache accompanied by fever, and headache accompanied by persistent focal neurologic deficit all represent special situations wherein immediate medical attention absolutely is required. Headache beginning after age 55 and (at any age) a change in the character of a previously stable headache disorder less commonly represent secondary headaches but do require medical evaluation on a non-emergent basis.

Want to Know More?

Tests and procedures that physicians commonly recommend for headache patients include brain CT or MRI scans, brain magnetic resonance angiography (MRA), brain arteriography, lumbar puncture and electroen-

cephalography (EEG). With the exception of EEG, all of these may be quite helpful in excluding secondary headache and establishing that the patient has a primary headache disorder. As we emphasized in this book’s introduction, however, the most effective tool for differentiating between primary and secondary headache is the patient’s history in combination with a thorough physical examination.

CT Scan

Since 1980 brain computerized tomography (CT) has been widely available for neurologic diagnosis. CT utilizes x-rays to generate photographic “slices” of the brain that may be adjusted to variable degrees of thickness, and the sensitivity of the test is in part dependent upon the thickness of each “slice”; the greater the thickness, the lower the sensitivity. Figure 2.3 demonstrates a CT slice that demonstrates (arrow) an area of bleeding within the left hemisphere of the brain.

When dye is administered intravenously to the patient, the procedure is termed a *contrasted* CT; when no dye is given, the procedure is *noncontrasted*. Noncontrasted brain CT remains the best noninvasive means to identify acute bleeding (hemorrhage) within the brain or immediately adjacent to it; in most other instances, noncontrasted CT is not particularly sensitive in detecting brain pathology. The addition of contrast dye increases the sensitivity of the procedure for identifying tumors, abscesses and other structural abnormalities, but contrasted CT typically is less sensitive than brain MRI in all clinical situations.

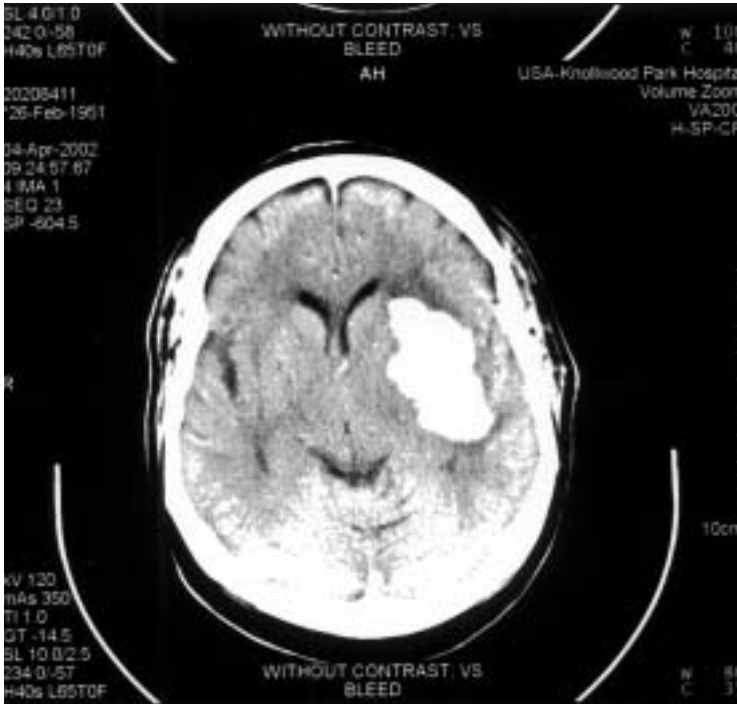


Figure 2.3 A brain CT scan performed without contrast dye shows an area of hemorrhage (bleeding) within the brain tissue of the left hemisphere. The patient had uncontrolled hypertension (high blood pressure).

CT is a relatively noninvasive procedure. Because X-rays are used, women who are pregnant should not undergo CT, and administration of contrast dye at times causes an allergic reaction of varying degrees of severity. Individuals who may be pregnant or have a history of allergy to contrast dye, shellfish or iodine should advise their physicians of this before undergoing the procedure.

MRI

Brain magnetic resonance imaging (MRI) uses an extraordinarily strong magnetic field to generate images of the brain that are of much higher resolution and clarity than what can be produced by CT scan (Figure 2.4). With the previously stated exception of acute intracranial hemorrhage, brain MR is superior to CT for virtually all diagnostic purposes, and that includes the process of ruling out secondary causes of headache. MRI is about the closest we presently can come to a totally noninvasive brain imaging procedure. X-rays are not utilized, and about the only contraindication to MRI is the presence of ferromagnetic material within the body (e.g., a surgical clip) or a cardiac pacemaker.

Lumbar Puncture

Lumbar puncture (LP) involves the insertion of a needle into the fluid-filled (*subarachnoid*) space that surrounds the spinal canal. The puncture is performed below the level where the spinal cord ends, and it is extremely rare for a patient to suffer any significant complications from the procedure. The clinician performing the LP typically first uses a special tube (manometer) to measure the hydrostatic pressure exerted by the escaping cerebrospinal fluid (CSF). In most cases, that pressure reflects exactly the pressure existing within the compartment occupied by the brain, and abnormally high or low intracranial pressure (both causes of secondary headache) can be excluded by LP. CSF then is collected within small tubes that are sealed, sent to the laboratory and analyzed; a

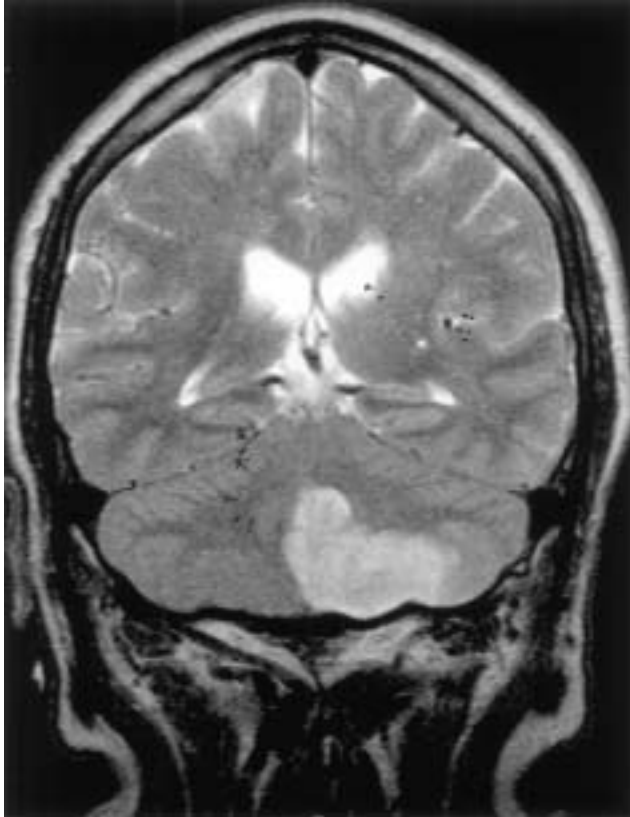


Figure 2.4 A 64-year-old man with high blood pressure, diabetes and a history of prior stroke acutely developed “dizziness,” slurred speech and inability to walk, with a tendency to fall consistently towards the left. A brain CT scan performed shortly after he was brought to the hospital was normal, but this MRI scan demonstrated a large area of stroke injury involving his left cerebellum.

routine CSF analyses involves measurement of the glucose and protein concentrations within the CSF and a search for red or inflammatory (white) blood cells.

The subarachnoid space (the compartment from which the CSF is extracted) is contiguous with the same space surrounding the brain, and, again, an LP is quite useful for ruling out abnormalities of intracranial pressure. It also is extremely helpful in excluding subarachnoid hemorrhage within the brain and is a more sensitive test than noncontrasted CT for that purpose. An LP also is crucial for diagnosing infection or inflammation within the brain (*encephalitis*) or lining of the brain (*meningitis*) and should be performed on every patient who presents with fever, stiff neck and headache as a prominent symptom.

The only common complication of LP is, ironically, headache. The headache is believed to result from continued leakage of CSF through the punctured lining of the spinal canal and into surrounding tissue. The headache that results from an LP characteristically is positional, worsening when the patient is upright and rapidly improving when the patient lies down. Most post-LP headaches resolve spontaneously within a few days and require no treatment beyond bed rest, vigorous oral hydration (especially caffeinated fluids) and administration of simple analgesics such as aspirin or acetaminophen. In a small minority of cases, the headache persists, is severe and requires the placement of a *blood patch*. This involves the injection of a small amount of the patient's own blood into the same area where the LP was performed; the mechanism by which a blood patch may ter-

minate post-LP headache remains something of a mystery, but its effectiveness cannot be denied.

EEG

An electrocephalogram (EEG) is a noninvasive procedure that involves the application to the scalp of a set of electrodes that measure electrical activity generated by the brain's neurons. The test primarily is used for diagnosing and following epilepsy, and even in that setting its relative insensitivity and lack of specificity are legendary. It is not a useful test for headache diagnosis; despite this, many physicians continue to order EEGs routinely on their headache patients, a practice that does little more than add to the already burgeoning cost of health care in the United States.

Other Tests

At times, your physician may order blood tests that relate directly or indirectly to your headache syndrome. For example, in patients over the age of 55 who experience the new onset of persistent head pain, a condition involving inflammation of the arterial blood vessel wall, giant cell arteritis, must be excluded; a simple blood test called an *erythrocyte sedimentation rate* ("sed rate") can be very helpful for this purpose. In other cases, you may be taking a prophylactic (preventative) medication for headache that requires periodic blood test monitoring, or your physician simply may wish to exclude the presence of other diseases that may cause or be associated with chronic headache (eg, hypo [low] thyroidism).



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