A Diagnostic Approach to Acute Headache

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Headache is one of the most common symptomatic ailments encountered by the physician. According to one estimate, headache constitutes the major complaint in more than 50% of patients seen in office practice.[1] This figure refers to patients with chronic recurring headache, many of whom are seen electively when they are asymptomatic, and may not accurately reflect the frequency with which patients present, during the acute phase, complaining of head pain. The term acute headache refers to those episodes of cephalgia which lead the patient to seek immediate medical care.

Headache must of course be regarded as a symptom and not a disease. Almost everyone suffers an occasional headache, be it from psychologic stress or excessive indulgence. Fortunately the vast majority of head discomforts stem from minor and reversible conditions which do not pose a threat to health. On the other hand, headache secondary to a bacterial meningitis or subdural hematoma calls for prompt and often heroic measures. Referring to headache, Wolff states in the preface to his text, "Failure to separate the ominous from the trivial may cost life or create paralyzing fear."[2] Therefore, the evaluation of the patient with acute headache must avoid the extremes of passing the symptom off as a minor condition with only a haphazard evaluation, on the one hand, and of subjecting the patient to an unnecessarily expensive and extensive evaluation, on the other.

It is the purpose of this report to describe the evaluation of the patient who suffers from the onset of acute headache. The most important decision to be made in this setting is whether one is dealing with a benign or malignant illness. By malignant, I am referring to disorders in which early intervention is necessary to prevent death or disability. The symptoms and signs which may aid in this distinction will be presented as well as a sequential diagnostic approach which, one hopes, will insure as complete an evaluation as is necessary and at the same time cause no harm or undue discomfort.

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History

A detailed history is usually the clinician's most valuable tool in evaluating the patient with acute headache. The basic headache history should be concise and organized so that relevant facts are not overlooked. A simple outline of the important areas to be covered is in Table 1.

Onset. It is particularly helpful to establish the time and mode of onset. Headaches which begin in the second and third decades of life are commonly of vascular origin and migraine rarely makes its first appearance after the age of 50. On the other hand, temporal arteritis and glaucoma must be considered when headache has its onset in the fifth decade or later. Headaches secondary to cervical spondylosis or depression are also more likely to occur among older patients.

The time of day at which the headache begins may also be helpful. Pain due to space-occupying intracranial disease is notoriously worse on waking in the morning. Head pain, on the other hand, due to muscle tension or cervical osteoarthritis usually is worse in the late afternoon, and cluster headaches typically awaken the patient in the middle of the night.

Also under the heading of onset, one should establish the rapidity of onset. An abrupt severe

TABLE 1
Headache History Outline

1. Onset
2. Location
3. Severity
4. Temporal course (prodrome, duration, frequency)
5. Associated symptoms
6. Precipitating factors
7. Medical and family history

headache should make one suspicious of subarachnoid hemorrhage particularly if there is associated alteration of consciousness.

Location. The location of the headache may provide a diagnostic clue. In this regard, it is useful to have the patient point to the precise area of pain, and the region of radiation if one exists. Relying on the patient's anatomic knowledge may be dangerous, and indeed a "sinus heachache" may be located over the occiput.[3] The site of pathology may be clearly delineated in patients with dental and sinus disease. Pain localized to one eye should raise the suspicion of cluster headache or ocular pathology. Occipital and nuchal pain are often seen with chronic tension and with cervical osteoarthritis. Unilateral headaches typically occur in migraine but can also occur in more serious diseases such as temporal arteritis and subdural hematoma.

Severity. Pain itself cannot be measured by the observer and the headache may be equally intense whether its implications are benign or malignant. According to Wolff, "there are few instances in human experience where so much pain may mean so little in terms of tissue injury."[2] Severity of pain may, however, be estimated by asking such questions as, Did the pain awaken you from a sound sleep? Did it compel immediate rest and cessation of all activity? Severe pain is worrisome particularly if it comes on suddenly or if it represents the result of progressive increase in intensity.

Temporal Course. Prodromal, or premonitory, symptoms, such as scotomata and hemianopia, preceding the headache suggest migraine. Similar visual symptoms may uncommonly occur with angiomas and tumors.

Vascular headaches such as migraine and cluster are throbbing in character, usually last from minutes to hours, but tend to be episodic and recurrent. Tension headaches, on the other hand, are dull and nagging and characteristically are persistent, often lasting weeks and even months without a pain-free interval. Headache in the patient with a space-occupying lesion may be intermittent at first but generally becomes progressively more constant and severe.

Associated Symptoms. Nausea and vomiting are commonly associated with migraine. Vomiting, however, may also occur with increased intracranial pressure and frequently is unaccompanied by nausea. Patients with cluster often exhibit nasal congestion, unilateral redness of the eye, and lacrimation. Similar symptoms may be seen in the patient with upper respiratory infection (URI) or sinusitis, but these are generally more prolonged. Disturbance of vegetative functions such as sleep, bowel function, and appetite may suggest underlying depression. Associated convulsions or disturbance in consciousness should always raise concern of serious underlying disease. Focal neurologic symptoms and disturbances of vision, although commonly associated with migraine, should be carefully investigated.

Precipitating Factors. A variety of precipitants have been implicated in initiating a migraine attack. These include fatigue, menstruation, bright sunlight, alcohol, and tyramine-containing foods. Emotional factors, which so frequently precipitate headache, should be sought with careful questioning regarding recent marital, occupational, or financial difficulties. The exertional headache should always arouse suspicion of an intracranial lesion. This is a headache which comes on from complete comfort following activities such as running, coitus, and Valsalva maneuver. Although the pain is often quite severe, it usually is of brief duration. Also of concern are headaches which are precipitated by changes in posture or head position. Such headaches could represent a ball-valve effect produced by an intraventricular tumor.

Past Medical and Family History. A strong family history of migraine may be reassuring when evaluating the young adult with the sudden onset of unilateral headache; however, neither its presence nor absence is diagnostic. Since a variety of systemic illnesses such as chronic pulmonary and renal disease are associated with cephalgia, a complete medical history and review of systems should be performed. History of surgery on a melanoma or other primary tumor should alert the physician to the possibility of metastatic brain disease. A medication history should also be obtained. Previous relief from ergotamine or activation of headache with nitrates might suggest migraine. Recent use of reserpine in the predisposed

individual might provoke a depressive episode which is manifested by headache.

Examination

After obtaining the history the physician generally has a fairly good idea of the type of headache he is dealing with. A complete and careful physical and neurologic examination, however, provides an additional screen for underlying serious disease and helps in deciding what further diagnostic studies are necessary. Rather than reviewing the entire examination, this discussion will be limited to those aspects of the physical and neurologic examinations which are particularly relevant to the headache patient.

Observation. The appearance and activity of the patient during the initial interview often provides valuable information. Individuals with severe head pain have a characteristic facial expression and tend to move slowly and deliberately; the patient with psychogenic disease, on the other hand, often appears relaxed while complaining bitterly of severe discomfort.[4] Gait and station should also be observed; ataxic gait associated with the recent onset of headache is alarming and should be expeditiously pursued diagnostically.

Physical Examination. The vital signs, particularly temperature and blood pressure, should be routinely recorded. Fever and its resultant vasodilation may be responsible for headache; however, its presence should prompt a search for infection. A central nervous system infection such as meningitis or brain abcsess must be considered. It should be remembered that fever may also be present in some systemic illnesses such as temporal arteritis. Headache can be the earliest symptom in the patient with malignant hypertension. The headache associated with hypertension is usually generalized, throbbing, and often increased in the supine position.

A careful examination of the head and neck is essential in evaluating the patient with head pain. Inspection may reveal a tortuous and prominent superficial temporal artery in the patient with temporal arteritis, or facial erythema and lacrimation in the individual suffering an acute cluster attack. Fundoscopy is a 'must' in any patient presenting with acute headache. Visual fields should be checked by confrontation. Any patient with a disturbance of vision or visual field defect which is not transient, or clearly associated with a migraine attack, must be investigated further. One can also grossly evaluate intraocular pressure by palpating the eye through the closed lid. Glaucoma may present initially with headache, and careful tonometry needs to be performed if this diagnosis is suspected. Finally the nose, ears, and mouth should be examined for evidence of inflammation. Patients with URI and flu-like syndromes often list headache as their primary complaint.

Limitation of movement or spasm on examination of the neck would suggest cervical spondylosis or chronic tension. Stiffness, however, with limited neck flexion is usually noted in the presence of meningeal irritation, and meningitis or subarachnoid hemorrhage should be suspected.

Neurologic Examination. A complete neurologic examination of the headache patient is very important. Perhaps the most important part of this examination is the assessment of mental status. Altered consciousness in a patient presenting with headache should always be regarded with concern. An evaluation of the cranial nerves should also be carried out. The first cranial nerve is often neglected and may be easily tested by having the patient identify common odors, such as tobacco, through each nostril. Anosmia may be the only sign of olfactory groove meningioma.

Motor and sensory function as well as reflexes and coordination should be systematically tested. Any abnormality on neurologic examination which cannot be confidently explained on the basis of a previous illness or injury requires further diagnostic study.

Diagnostic Studies

The diagnostic evaluation of the headache patient should proceed in a logical sequential manner to insure a complete investigation when necessary and to prevent costly and potentially harmful studies when these are not indicated. To conceive of the acute headache evaluation occurring in stages is a useful approach[5]; however, certain circumstances may require a more expedient evaluation and therefore this approach is intended to be a guide rather than a cookbook to testing patients complaining of acute headache (Table 2).

The first and probably the most important stage consists of a detailed history and thorough examination as outlined earlier in this paper. All patients except those requiring urgent therapeutic procedures should pass through this phase. Unless there has been a recent evaluation or the diagnosis of a benign entity is certain, patients should undergo routine screening

TABLE 2
Approach to Diagnostic Evaluation

Stage 1	History and physical
Stage 2	Routine screening (eg. CBC, ESR, skull x-rays)
Stage 3	Extensive systemic and neurologic evaluation (eg. CT scan, EEG, lumbar puncture)
Stage 4	Invasive diagnostic studies (eg. angiography, ventriculography)

tests. The procedures which constitute Stage 2 not only provide information which cannot be obtained on examination but also serve to reassure the patient that a complete evaluation is being carried out.

Stage 2 at a minimum should include a complete blood count (CBC), erythrocyte sedimentation rate (ESR), and skull x-rays. Other studies such as urinalysis, chest x-ray, and blood sugar might also be included. An elevated ESR is a sign of chronic inflammation and primarily serves as a screen for cranial arteritis.

Although the skull x-ray is frequently normal in the headache patient, exceptions must not be forgotten. When least expected, the skull x-ray may reveal signs of raised intracranial pressure, deviation of the pineal, or metastatic lesions. Because of the widely held belief in the infallibility of x-rays, a normal skull series may take on prophylactic and therapeutic properties.[6] An acute tension headache may become chronic through the fear of an underlying tumor.

If, following the completion of Stage 2, one is convinced that the headache is secondary to tension, migraine, URI, or other benign entity, the initial evaluation should be completed. It is probably wise, however, in most cases to arrange for a follow-up visit within a couple of weeks.

TABLE 4
Examination Findings Suggesting Serious Underlying Disease

1. Disturbed level of consciousness
2. Difficulty walking or sitting
3. Disturbance of vision or visual field that is not clearly migrainous
4. Hypertension
5. Stiff neck
6. Any unexplained abnormality on neurologic examination

TABLE 3
Historical Features Suggesting Serious Underlying Disease

1. Abrupt onset
2. Persistent unilateral pain
3. Progressive course
4. Disturbance of consciousness
5. Convulsions
6. Focal neurologic symptoms
7. Headache precipitated by:
   a. exertion
   b. change in posture
8. History or symptoms suggestive of systemic illness

Patients should advance to the third stage of testing when disturbing information is obtained on history, abnormalities are found on examination, or routine screening studies are abnormal (Tables 3 and 4). Some but not all patients who reach this stage require hospitalization. Included at this level would be electroencephalogram (EEG), brain scan, computerized tomography (CT) scan, and lumbar puncture. Depending on suspicions, cervical spine x-rays, sinus films, or other special studies might be indicated.

Stage 4 consists of the use of invasive techniques such as angiography and ventriculography. On occasion it may be necessary to employ these studies after a brief history and examination. However, most often they should be performed after screening procedures have been completed and careful consideration has been given. The studies at this level require hospitalization.

The Acute Headache Problem

In an attempt to put the acute headache problem into some perspective, the emergency room admission records of patients seen in the Medical Emergency Room at the Medical College of Virginia during the month of March, 1977, were reviewed. Of the 1998 visits that month, 105 or 5% listed headache as one of the major complaints. Sixty-one percent of these 105 patients were under the age of 30 despite the fact that no patients under 15 are seen in the Medical Emergency Room. Better than two thirds of the patients were female.

According to the emergency room records, the majority of patients suffered either from tension, URI, or migraine, in that order. A complete breakdown of diagnosis is presented in Table 5.

Only eight patients were admitted to the hospital; three of these had meningitis and two were admit-

TABLE 5
Characteristics of 105 Acute Headache Patients Seen in MCV ER

AGE	15–20	21–30	31–40	41–50	>51
	22	42	19	10	12
SEX	Male	Female			
	34	71			
DIAGNOSIS:			Anxiety-Tension		30
			URI-Flu Syndrome		23
			Vascular-Migraine		17
			Posttraumatic		6
			Hypertension		6
			Depression		4
			Sinusitis		4
			Meningitis		3
			Alcohol intoxication		3
			Other		9
ADMITTED TO HOSPITAL			Meningitis		3
			Depression		2
			Cerebral hemorrhage		1
			Cerebral infarct		1
			Alcoholism		1

ted to the psychiatry service because of depression.

Based on this somewhat superficial review of a selected population, it would appear that the patient seeking acute care for headache is usually young, female, and suffers from a benign entity. However, one cannot be complacent. As is demonstrated, headache is a symptom of a wide variety of disorders, some of which are life-threatening. In order to arrive at a correct diagnosis, an organized approach based on a careful history, complete examination, and sequential testing is essential.

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