

Chapter 139

Headaches in the Emergency Room

Dominique Valade

INTRODUCTION

In emergency departments (7,8), the top priority is to establish a precise etiologic diagnosis and to classify the headache as a primary headache, a benign secondary headache, such as from influenza, or a secondary headache due to a serious condition, requiring further exploration or emergency treatment (meningeal hemorrhage, meningitis, intracranial hypertension) (2,6). The crucial part of this diagnostic step is the interview. This step, supplemented by the clinical examination, will determine the diagnosis and, ultimately, the course of treatment, which is usually conducted on an outpatient basis for primary headache. For benign secondary headache, further diagnosis may be necessary, but can be continued on an outpatient basis. Finally, emergency diagnosis and treatment in the hospital setting may be necessary for secondary headache with serious underlying causes.

The physician must also identify headaches occurring in patients already hospitalized for another reason. It is important to rule out any iatrogenic causes such as drug-induced headaches or headaches caused by hypotension of the cerebrospinal fluid (CSF), such as secondary to a persisting fistula.

Finally, some patients diagnosed with a primary headache may sometimes require hospitalization either because of an acute exacerbation of their primary headache in a particular psychologic context, or, especially, for detoxification for chronic daily headache associated with drug abuse.

STEPS IN THE INITIAL DIAGNOSIS OF A HEADACHE SEEN IN THE EMERGENCY ROOM

Obtaining a History of a Patient Who Presents With Headache

The first step in the diagnosis of headache is to obtain a history from the patient by interview. This can be difficult

for a patient suffering from an intense headache, but can be manageable in a quiet, dark room. During the interview the physician should attempt to ascertain the duration since headache outset, the characteristics of the pain, and the circumstances of and symptoms associated with onset (Fig. 139-1).

Duration Since Onset and Evolutionary Profile

The following questions can assist the physician in classifying the headache:

- How did the headache begin? (sudden or progressive onset)
- How long have you had this headache? (acute or chronic headache)
- Have you ever had this type of headache before? (unusual cephalgia or a new attack of a known headache pattern)
- How has the pain changed since the onset of the headache? (spontaneous improvement, became worse, or remained the same)

Based on the answer to these questions, the headache can be classified as one of four types:

- Sudden acute headache
- Unusual new headache, beginning in the previous days, weeks, or months
- Paroxysmal chronic headache (migraine, cluster headache)
- Chronic tension-type headache or chronic secondary headache

The principal arguments for further diagnostic investigation are headache pain of recent onset, a new occurrence of fast or sudden onset, or, in a patient with a history of primary headache (migraine or tension headache), a pain that is totally different from the usual headache.

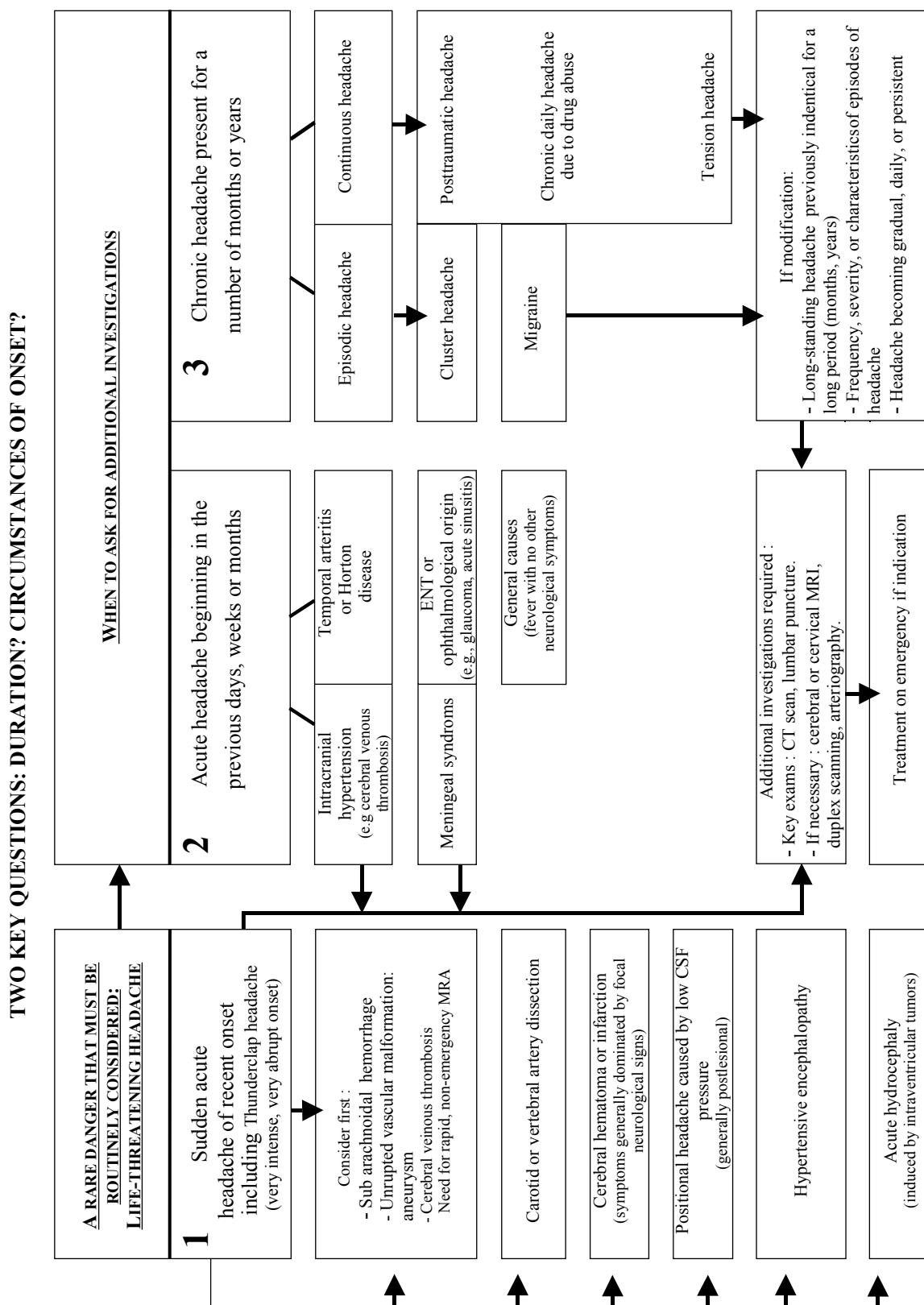


FIGURE 139-1. Two key questions: What has been the duration of the headache? What were the circumstances of onset? CSF, cerebrospinal fluid; CT, computed tomography; MRA, magnetic resonance angiography; MRI, magnetic resonance imaging.

Characteristics of the Pain

The intensity of the pain does not give any indication for a diagnosis of primary or secondary headache. Nevertheless, any sudden and severe headache (thunderclap headache) must be regarded as secondary and further explored in the emergency department. It is important to consider the correlation between the intensity of the pain described by the patient and how the pain impacts his or her attitude (e.g., does he or she require bed rest, difficulties in expressing himself or herself). The type of pain can be very variable (pulsatile, continuous, "electric shock," crushing, pressure, only discomfort) but may not be specific to a particular etiology. Topography can sometimes be an indication of a specific disease, such as the temporal pain of Horton's disease, but is usually not specific to a particular etiology.

Circumstances of Onset

The circumstances surrounding the onset of a headache can sometimes guide the physician to an immediate diagnosis: cranial trauma (hemorrhage or cerebral contusion), medication or drugs recently taken, a lumbar puncture, recent peridural (epidural) or spinal anesthesia causing CSF hypotension, fever associated with general disease, etc.

However, the circumstances surrounding onset can also be misleading: An exertional headache can be benign but also a symptom of a meningeal hemorrhage, and a headache after lumbar puncture is generally a headache caused by hypotension of the CSF but can sometimes signal a cerebral venous thrombosis (1).

Medical History

A patient's medical history must be obtained in a systematic way because it may qualify the diagnosis. Cardiovascular disease and hypertension (AVC), postpartum or venous thrombosis of the lower limbs, cerebral venous thrombosis, neoplasm (metastases), immunosuppressed patients with HIV (cerebral toxoplasmosis), anxiety and depression (decompensation with tension headache), and consumption of psychotropic drugs can all affect headache diagnosis.

Associated Symptoms

Any recent and unusual headache associated with a neurologic symptom, such as loss of consciousness, epileptic seizure, or focal signs, should always be assumed to be due to an intracranial lesion until proven otherwise. A headache with deterioration of health or claudication of the jaw in a patient of more than 60 years of age should immediately point to a possible diagnosis of Horton disease. On the other hand, nausea, vomiting, photophobia, and phonophobia are nonspecific symptoms associated with

meningeal syndromes, such as intracranial hypertension, but are also associated with migraine. The absence of any associated symptoms does not eliminate a diagnosis of secondary headache and should not postpone the initiation of additional examinations if the headache is recent, unusual, and persistent.

Clinical Examination

In addition to a general examination including blood pressure and temperature, a clinical examination should include a neurologic and physical examination. Any abnormality in either the neurologic or physical examination indicates the need for further evaluation. On the other hand, a strictly normal clinical examination does not eliminate the possibility of a serious cause and should not preclude laboratory investigation.

Neurologic Examination

Initially, the neurologic examination considers state of consciousness and cortical function of the patient and explores the possibility of a meningeal syndrome. Then, the physician should check for a focal deficit that the interview could have missed. The physician should then examine the eyelids and the pupils for signs of Claude-Bernard-Horner, which can indicate dissection of the internal carotid artery or unilateral mydriasis caused by compression of the third cranial nerve by an aneurism of the posterior communicating artery, and rule out a cerebellar syndrome such as static cerebellar ataxia, which can go unnoticed in a patient lying down. The physician should also check for anomalies of the visual field, such as left-side homonymous hemianopia of a right occipital lesion in a right-handed patient who complains only about headaches. Finally, the physician should conduct a funduscopic examination to check for papillary edema or hypertensive retinopathy, possibly indicating hypertensive encephalopathy.

Physical Examination

The physical examination should include palpation of the temporal arteries; examination for unusual sinus pressure, redness of the eyes, and exophthalmia or swelling of the eyelids; palpation of the eyeballs; and, finally, auscultation for inspiratory and expiratory breath patterns. It is also important to palpate the cervical and chewing muscles, which are very often contracted and painful in the case of a tension-type headache.

Strategy of the Diagnostic Evaluation

The usual blood examinations are seldom conclusive, except for an increase in the sedimentation rate, which indicates temporal arteritis or an infectious state.

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Any recent headache that is unusual and persistent, whether of sudden or progressive onset, requires two basic examinations to be carried out in a systematic way: the computed tomography (CT) scan without contrast injection and a lumbar puncture (LP) (5).

Computed Tomography Scan

The CT scan is the first examination to be conducted looking for the presence of blood either in the subarachnoid spaces, or in the cerebral or cerebellar parenchyma. It can also show hydrocephalus or localized edema indicating an expansive lesion (tumor or abscess) and will then have to be further investigated later by CT scan with injection or magnetic resonance imaging (MRI) (5). If there is a possibility of acute sinusitis, a scan of the sinuses can be useful. A normal CT scan does not preclude an organic cause: 5 to 10% of meningeal hemorrhages, 30% of cerebral venous thrombosis, many cases of cervical arterial dissection with only headache or some local signs, and many cases of meningitis have normal CT scans, requiring continued investigation.

Lumbar Puncture

The LP should follow a CT scan for each headache that is unusual or of sudden or progressive onset, with a normal CT scan, to search for blood or meningitis, even in the absence of meningeal syndrome. In some cases, LP can be indicated first if there is fever and normal consciousness in the absence of focal neurologic signs, in the event of a possible meningeal hemorrhage, or if a CT scan is not available or normal. It is essential to measure the CSF pressure. Intracranial hypertension with normal CT scan requires checking for a cerebral venous thrombosis or a dural rent.

Transcranial Doppler and Extracranial Duplex Scanning

This examination must be conducted immediately each time the clinical picture indicates a possible carotid or vertebral artery dissection. The dissection can appear as an acute unilateral headache, sometimes isolated, but generally associated with local signs such as painful Claude-Bernard-Horner, tinnitus, paralysis of the last cranial nerves, or signs of retinal or cerebral ischemia. Echocardiography can visualize a hematoma in the arterial wall in which duplex ultrasound evaluates the possible hemodynamic repercussion. However, these two examinations can be strictly normal, particularly in the purely cephalalgic forms, either when the dissection affects portion of the arteries, or when it does not involve a significant arterial stenosis. The diagnosis must then be verified by MRI with magnetic resonance angiography (MRA).

Magnetic Resonance Imaging and CT-Angiography

The MRI is the diagnostic tool of choice for diagnosing cerebral venous thrombosis, which can begin with an acute monosymptomatic headache with normal CT scan and lumbar puncture.

Conventional Cerebral Angiography

It is indicated in the event of acute headache in only two cases:

Meningeal hemorrhages in which the angiography must be conducted by an intra-arterial method to diagnose a possible ruptured or endovascular aneurism

Sudden and severe headache, which is nonregressive, when all preceding examinations are normal. It is not always possible to formally exclude a cerebral venous thrombosis, an arterial dissection, or angiopathies of the arteries of middle gauge. An MRA or an angioscan can be conducted first, possibly followed by intra-arterial angiography. This last examination is often the only one able to clearly show irregularities, "string and beads," of a reversible acute cerebral angiopathy; this can also present as one or more episodes of thunder-clap headache, even when the CT scan, LP and MRI are normal.

TREATMENT

We mention only in this chapter the treatments that are carried out in the emergency room.

In cerebral sinus or venous thrombosis the leading symptom is headache in 80% and thunderclap headache in 25% of patients. It is very important to have an early diagnosis to start heparin therapy to improve consciousness and resolve neurologic function. At the beginning an epileptic strategy should be initiated to prevent seizures.

The correlation of cervical pain, headache, and ischemic signs is characteristic of dissection of carotid or vertebral arteries, and anticoagulant therapy must be rapidly administered to prevent embolism unless the dissection extends intracranially.

If there is an acute posttraumatic headache, in particular with epidural hematoma, immediate trepanation of the skull is the treatment of choice

Various treatments have been used for patients with spontaneous CSF leaks, but there is not one definite approach (4). Some patients, fortunately, improve spontaneously. Bedrest and increased fluid intake have been advocated. The effectiveness of caffeine has been shown in some studies, but durable beneficial effect is doubtful. The efficacy of steroids has not been established. However, there is no control study. Autologous epidural blood patch (EBP) can be considered as the best treatment. In

emergency, if diagnosis is certain, the importance of headache could justify EBP immediately. The recommended target volume is 20 mL (9), but more seems to be optimal; the duration of decubitus after the procedure is 2 hours and the patient could quickly go back home. For orthostatic headache, response to an EBP may occur within minutes, whereas a more permanent delayed response occurs within hours or days and results from definitive sealing of the leak. The success rate is less (30%) than for post-LP headache for two reasons: the level of the leak may be distant from the level of the EBP, and the nature and anatomy of the leak are much different from a simple hole. If a delayed response is absent, EBP can be repeated, sometimes after confirmation of CSF leak, to target the EBP as close as possible to the level of leak. In well-selected cases, surgical intervention can be tried when conservative approaches have failed (3).

When giant cell arteritis is suspected, an erythrocyte sedimentation rate or a C-reactive protein test must be performed. Sometimes they might be very high and sometimes they may be normal. Nevertheless, to avoid visual loss, treatment with steroids should be started as soon as the diagnosis is suspected and always before results of arterial biopsy.

Patients with acute angle closure glaucoma present with pain localized to the eye and radiating to the ear, sinus, and teeth. The intraocular pressure must be measured, and the treatment is with miotics such as systemic acetazolamide, pilocarpine, or eye drops of β^- .

Acute sinus infections are often easy to diagnose because the headache is associated with nasal obstruction, fever, and localized tenderness; however, sphenoidal sinusitis may be painful without associated signs. To avoid intracranial complications, immediate antibiotic and anti-congestant therapy is mandatory and, if appropriate, sinus drainage may be carried out.

During migraine attack, it frequently occurs that a patient comes to the emergency department without having taken any treatment, and then it may be sufficient to initiate therapy with a single 1-g oral dose of aspirin or even with a nonsteroidal anti-inflammatory drugs (NSAID), either by oral route or, in case of vomiting, in suppository form. Metoclopramide or metopimazine in suppositories or by IV administration is given in combination with the above mentioned drugs if serious vomiting is present.

If the patient has already taken aspirin, an NSAID, or paracetamol (acetaminophen) possibly combined with caffeine, codeine, or even dextropropoxyphene, the use of a specific antimigraine therapy is indicated, preferably by nasal or subcutaneous route, as follows:

20 mg sumatriptan nasal spray
6 mg/0.5 mL subcutaneous sumatriptan

In cases of known allergy or contraindication to triptans, it is possible to use dihydroergotamine (DHE) either by nasal route (DHE spray) or injectable route (in-

tramascularity, subcutaneously, or intravenously) (DHE 1 mg/mL).

Either metoclopramide or metopimazine in suppository form or by injectable route must always be administered in combination with therapy.

When specific antimigraine drugs are not effective, preference should be given to the parenteral route of administration. Depending on individual habits and types of medication previously taken by the patient for treatment of attack, the following can be administered:

1 g paracetamol (acetaminophen) over a short 20-minute intravenous infusion in the absence of excessive self-medication with paracetamol (acetaminophen)
ketoprofen in infusion under the same conditions as paracetamol
nefopam in infusion under the same conditions as described above

A 20- or 50-mg ampule of clorazepate dipotassium can be added to infusion depending on the patient's anxiety condition; in case of nausea or vomiting, a 10-mg ampule of metoclopramide can also be added.

In the event of failure of the abovementioned infusions, or in case of excessive use of medicinal products not allowing the use of the abovementioned drugs, 50 mg of amitriptyline and 1 mg/mL clonazepam can be administered, especially if the acute attack is accompanied by tension-type headache. Amitriptyline and clonazepam are infused slowly over approximately 2 hours, after informing the patient that, as a result of the sedative effect of these drugs, it will be necessary for him or her to be escorted home by another person.

In case of *status migrainosus*, the patient should be hospitalized to continue this treatment. In case of excessive use of medicinal products, withdrawal should be planned in a second phase.

For pregnant or nursing women, paracetamol by intravenous route is prescribed as first-line therapy in patients who are not excessive users of analgesics. In the event of treatment failure or daily chronic headache, oxygen delivered via face mask at a rate of 10 L/min for 30 minutes may be administered.

In addition to simple analgesics, which most often would have been given to the child by his or her parents before arrival in the emergency department, the recommended first-line therapy in young children is as follows:

20 mg/mL ibuprofen: 0.5 mL/kg (i.e., 10 mg/kg of body weight, starting from age 6 months)
diclofenac 25-mg suppositories starting at 16 kg body weight (i.e., children over 4 years of age)
275 mg naproxen starting at 25 kg body weight (i.e., children over 6 years of age)
paracetamol (acetaminophen) alone in combination with metoclopramide under the same conditions as described above

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ergotamine tartrate: 1 tablet in children over 10 years of age, never exceeding the dose of 6 tablets/week
sumatriptan 10 mg nasal spray starting at 35 kg body weight (i.e, over 12 years of age)

The rectal route or nasal spray should be given preference in the event of gastrointestinal disorders.

A child presenting with migraine disease should receive relaxation therapy as soon as possible.

Management of migraine disease in an emergency department requires a careful interview and a rigorous physical and neurologic examination of the patient to avoid overlooking any potential secondary headache. Treatment of the attack, adjusted to previous therapies, contraindications, and any excessive use of medicinal products, will be offered to the patient. In the aftermath of the attack, the patient should be managed and in particular should consult his or her family doctor or a neurologist.

Even if the cluster headache attacks are short-lived, they present very often to the emergency room for a lot of reasons: last subcutaneous sumatriptan used during the night, more than two attacks during 24 hours, such as six or seven treated with sumatriptan in the same day, and accentuation of the number of attacks since some days. Oxygen should always been administered first even when it has been tried previously, and sometimes intranasal lidocaine may be effective. Finally, to try to stop the increase of attack frequency, 1 g of intravenous hydrocortisone may be tried.

The tension-type headache patients need emergency medical advice when the intensity of the pain is modified or when the outcome is chronic daily headache; tranquilizers such as lorazepam or muscle relaxants such as clonazepam may be attempted first and a follow-up with a neurologist must be recommended.

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