Headache in the Emergency Department

Avoiding Misdiagnosis of Dangerous Secondary Causes

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KEYWORDS

• Primary headache • Secondary headache • Thunderclap headache
• Headache misdiagnosis

KEY POINTS

- There are a number of dangerous secondary causes of headaches that are life, limb, brain, or vision threatening that emergency physicians must consider in patients presenting with acute headache.
- Careful history and physical examination targeted at these important secondary causes of headache will help to avoid misdiagnosis in these patients.
- Patients with acute thunderclap headache have a differential diagnosis beyond subarachnoid hemorrhage.
- Considering the "context" of headache "PLUS" some other symptom or sign is one strategy to help focus the differential diagnosis.

NATURE OF THE PROBLEM/DEFINITION

Headache is the fourth most common chief complaint in the emergency department (ED), comprising approximately 3% of all ED visits in the United States.[1,2] Depending on its underlying cause, headache can be broadly categorized as either primary or secondary. The International Classification of Headache Disorders identifies primary headaches as migraine, tension-type, cluster, or one of the other trigeminal autonomic cephalgias.[3] These comprise the vast majority of headaches.[4] Secondary headaches are defined as those due to a distinctive underlying disorder, such as trauma, infection, or malignancy.[3] Evaluation of the patient with headache in the ED is focused on the alleviation of pain and the consideration of dangerous secondary causes.

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A sophisticated clinical approach must be used to determine which patients require expedited neuroimaging or further diagnostic evaluation for potential secondary headache. An in-depth understanding of several specific pathologic entities, many of them rare, is necessary to identify serious disease without the overuse of diagnostic resources in patients with primary and benign presentations. Moreover, in some cases, misdiagnosis of a particular type of secondary headache may lead to treatment that is deleterious to the patient.

GENERAL APPROACH TO THE PATIENT WITH HEADACHE

The first goal of the emergency physician (EP), if the patient is stable, will be targeted at relieving the patient's pain and discomfort. It is important to note that primary and secondary headaches cannot reliably be differentiated based on response to analgesic therapy. A multitude of life-threatening causes of secondary headache, including subarachnoid hemorrhage (SAH) and cervical artery dissection (CeAD), have been reported to respond to simple analgesic and antimigraine medications.[5–12] As the patient's pain is being addressed, the EP considers secondary causes that warrant further workup and intervention. **Table 1** illustrates the most critical secondary diagnoses to consider in the patient with undifferentiated headache, along with key clinical features, and diagnostic and treatment considerations.

The 2009 American College of Emergency Physician (ACEP) clinical policy on acute headache evaluation describes 4 specific groups that deserve special attention and may warrant neuroimaging in the ED setting (**Table 2**).[13] Although we advocate adherence to these guidelines, we aim to highlight additional high-risk presentations and diagnoses. In this article, we identify 10 important clinical scenarios. Not all scenarios necessarily mandate neuroimaging or other testing; each case should be evaluated within its own unique clinical context. Following the discussion of high-risk scenarios, the specific diagnoses of greatest importance to the practicing EP are examined further.

HIGH-RISK CLINICAL SCENARIOS

Scenario 1: Headache + Sudden/Severe Onset

The quintessential dangerous headache presentation is that of the patient with severe, sudden onset of symptoms. Although cases of "thunderclap headache" may ultimately be attributed to primary or benign causes, emergent causes must be considered. A patient presenting with the new onset of a severe and sudden headache will require neuroimaging in the ED to detect hemorrhagic stroke, including SAH.[13–16] Best practices for ruling out SAH in this clinical setting continue to evolve as new data emerge. Cranial computed tomography (CT) without intravenous (IV) contrast does not demonstrate bleeding in all cases and a complete workup currently includes a lumbar puncture (LP) to detect the presence of xanthochromia or red blood cells.[17–19]

Although SAH is a critical to identify, a broader differential of life-threatening diagnoses exists in these patients.[16,20,21] In addition to hemorrhagic stroke, any vascular origin of headache in the arterial or venous system can cause a sudden onset of symptoms. For example, other potential underlying pathologies, such as CeAD and cerebral venous thrombosis (CVT), may present with a thunderclap, and may be clinically indistinguishable from SAH. Severe unilateral symptoms in the head and neck, particularly when accompanied by neurologic deficits, raise concern for CeAD.[22–25] Although CVT more often presents as a gradual-onset headache with other associated visual or