Benign Thunderclap headache

Benign “thunderclap headaches” (BTH) or crash migraine. Severe global headaches of abrupt onset that reach maximal intensity in < 1 minute, accompanied by vomiting in as 50%. They may recur, and are presumably a form of vascular headache. Some may have transient focal symptoms.

Although “primary” thunderclap headache is typically accepted to exist, it may be that such cases represent missed diagnoses of underlying causes. The urgent evaluation of the patient with thunderclap headache includes brain CT, followed by lumbar puncture if the brain CT is nondiagnostic. If a diagnosis is not reached following brain CT and lumbar puncture, brain MRI and imaging of the brain and cervical vasculature are indicated.

Patients with thunderclap headache require an emergent and comprehensive evaluation to identify the underlying cause and to initiate appropriate therapy [1].

Differential diagnosis

There are no clinical criteria that can reliably differentiate these from SAH.

Patients with thunderclap headache must be evaluated emergently and comprehensively to rule out underlying disorders that can be associated with high mortality and morbidity, determine the cause for the thunderclap headache, and initiate targeted therapy.

The most common differential diagnosis are subarachnoid hemorrhage and reversible cerebral vasoconstriction syndrome [2].

Other relatively common causes include cervical artery dissection, cerebral venous sinus thrombosis, and spontaneous intracranial hypotension.

Although CTA is frequently used for evaluation of thunderclap headache patients, its utility is not clearly defined. LP follow-up is shown to be the most cost-effective strategy for evaluation of thunderclap headache patients in most clinical settings [3].

A decision tree analysis shows CT with LP follow-up to be the most effective strategy with the highest expected utility of 0.79926 quality-adjusted life-year (QALY) compared with 0.79875 QALY for no follow-up and 0.79869 QALY for CTA follow-up. Monte Carlo simulation showed LP was the best strategy in 86.4% of all iterations. Sensitivity analyses demonstrate that CT without follow-up is the best strategy only when the sensitivity of CT is very high (99.6%) or the pre-test probability of SAH in a patients with thunderclap headache with negative initial CT is low (1.6%).

CT with no follow-up was shown to be the best strategy when the pre-test probability of SAH is low (<1.6%) or the sensitivity of initial non-contrast CT for blood is high (>99.6%). Otherwise, LP should be the preferred strategy for follow-up [4].

Headache developed almost instantaneously in only half the patients with aneurysm rupture and in two thirds of patients with benign thunderclap headache (BTH). In patients with acute severe headache, female sex, the presence of seizures, a history of loss of consciousness or focal symptoms, vomiting, or exertion increases the probability of aneurysmal subarachnoid hemorrhage aSAH, but

these characteristics are of limited value in distinguishing aSAH from BTH. Aneurysm rupture should be considered even if focal signs are absent and the headache starts within minutes [5].

1)
Schwedt TJ. Thunderclap Headache. Continuum (Minneap Minn). 2015 Aug;21(4 Headache):1058-71. doi: 10.1212/CON.0000000000000201. PubMed PMID: 26252591.
2)
Cox M, Sedora-Román NI, Pukenas B, Kung D, Hurst R. Reversible cerebral vasoconstriction syndrome: an important non-aneurysmal cause of thunderclap headaches and subarachnoid hemorrhage. Intern Emerg Med. 2017 Aug 4. doi: 10.1007/s11739-017-1728-3. [Epub ahead of print] PubMed PMID: 28779450.
3)
Malhotra A, Wu X, Kalra VB, Schindler J, Forman HP. Cost-Effectiveness Analysis of Follow-up Strategies for Thunderclap Headache Patients with Negative Non-Contrast CT. Acad Emerg Med. 2016 Jan 4. doi: 10.1111/acem.12891. [Epub ahead of print] PubMed PMID: 26728524.
4)
Wu X, Kalra VB, Durand D, Malhotra A. Utility analysis of management strategies for suspected subarachnoid haemorrhage in patients with thunderclap headache with negative CT result. Emerg Med J. 2016 Jan;33(1):30-6. doi: 10.1136/emermed-2015-204634. Epub 2015 Jun 4. PubMed PMID: 26045444.
5)
Linn FH, Rinkel GJ, Algra A, van Gijn J. Headache characteristics in subarachnoid haemorrhage and benign thunderclap headache. J Neurol Neurosurg Psychiatry. 1998 Nov;65(5):791-3. PubMed PMID: 9810961; PubMed Central PMCID: PMC2170334.