WHAT TO DO WHEN SPONTANEOUS INTRACRANIAL HYPOTENSION IS WORSENED BY A POST PUNCTURE HEADACHE

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INTRODUCTION / AIM

43 y Fem. presented to a community ER, 3 days after tripping on uneven ground in her back yard, 24 hrs. later developed pain in the neck and occipital region, radiating bilaterally to the temporal region. The headache increased in severity over the course of a few hours, and was postural in nature.
PMHx: hypertension, dyslipidemia, Non smoker, alcohol intake two glasses of wine a day.
Meds.: rosuvastatin, perindopril, indapamide, and amlodipine.
A noncontrast CT head as well as a CT angiography of the Circle of Willis, were normal.
A lumbar puncture was performed with the intent of ruling out bacterial meningitis, but this procedure was not successful. The patient was discharged home with a prescription for Percocet.
Three days later, she presented to the same ER for persisting worsening symptoms. At this time, some cervical muscle steroid shots were administered, and she was once again discharged, with the diagnosis of migraine.
Three days later her family physician referred her to Neurology.
Seven days after her fall a new brain MRI shows small bilateral subacute vs chronic subdural hematomas, a mildly slumped midbrain, ventral flattening of the pons, and mild distention of the dural venous sinuses, all findings consistent with intracranial hypotension. The MRI spine did not identify a site of CSF leak.
At the moment of our consult the patient's headache was also present in supine becoming intolerable with postural changes.

Key words (SIH) Spontaneous intracranial hypertension, (PPH) post puncture headache, (CSF) Cerebro spinal fluid

METHODS

1. Criteria for Spontaneous intracranial hypotension
2. Implications of interventional procedures in the diagnosis of SIH
3. Establish differences in the conventional use of Epidural Blood patch
4. Implications of delay diagnosis and possible complications

RESULTS

The situation was explained to the patient and the possibility of a repeat blood patch was also explained.
We proceed to hydrate the patient (80cc/hr) even when PO. was tolerated, corrected her electrolytic imbalance and kept her on bed rest for 48hr. until the headache on supine was absent.
Analgesics, caffeine and bed rest were continued.

A Fluoroscopically guided blood patch was performed at the level of L3/L4, and 3 cc of omnipaque dye was used to verify position of the Tuohy (18G) needle in the epidural space; 17cc of Autologous blood was injected, this was the maximum volume used because the patient reported feeling pressure at the level of the neck. The injection of Blood should be stop at any moment that the patient reports pressure at any level of the spine, neck or head.

The patient was kept in the supine position for the next 4 hours. Afterwards the patient was allowed to take a shower sitting, at this point no headache was reported. However we still gave the patient restrictions for her activities of daily leaving for the next 2 weeks (no lifting, no valsalva, no pushing, no pulling), for the next 4 weeks caution and avoidance with lifting heavy weight was suggested. Afterwards normal activities should be well tolerated if there was no headache recurrence.

The patient was discharge from the hospital 3 days later, with no headache, no recurrence reported after 7 months.

**DISCUSSION / CONCLUSIONS**

The prototypical orthostatic headache is the most frequent manifestation of SIH, but thunderclap headache, non positional headache, exertional headache, second-half-of-the-day headache and cough headache can be also less typical manifestations.

This patient presents with a combination of two mechanism causing her CSF leak. SIH and PPH as she presented with a dry tap when the lumbar puncture was done. The original postural headache developed after a very mild trauma its clinical features are recognized in the literature as SIH, the cause of new daily persistent headaches, particularly among young and middle age people, but initial misdiagnosis remains common.

The international Criteria for Headache Disorders (ICHD-2) are clinical and rely on the positional features of the headache, the presence of associated symptoms and the resolution of symptoms after an Epidural Blood Patch. Other criteria that has been suggested includes radiological features with non invasive radiographic procedures, but still takes into consideration low opening pressure (< 60mm Hg).

No criteria takes into consideration the worsening of the headache and its possible complications due to a PPH by interventional radiographic procedures, measuring of opening pressure or Lumbar puncture to rule out other pathology.

With the anatomical knowledge of the two different mechanism that produced this CSF leak the treatment remains a Fluoroscopically guided Epidural blood patch, the difference consists that for SIH the lesion is most frequently thoraco-lumbar or cervico-thoraclic and the volume required to cover the epidural space to the level of the nerve root sleeve in the anterior spinal canal, where the lesion is most frequently presented, should be in the order of 20cc or more at the thoraco-lumbar level and about 10cc at the cervico-thoraclic level to avoid complications, for the PPH the lesion is in the posterior spinal canal; the Lumbar puncture was performed at the
L4/L5 level, therefore the volume might be variable, depending on the size of the puncture or multiple punctures.
Invasive Radiological procedures; CT myelography and radionuclide cisternography are effective in locating the CSF leak level 67% and 55% of the times respectively, (3), but worsening of the original pathology can happen with any interventional procedure. Worsening CSF leaks can lead to subdural hematomas, which can be produce by the original lesion or the subsequent lumbar puncture, in the case of our patient the subdural hematomas were not present in the original studies. Once the lumbar puncture was done and the headache worsened the subdural hematomas were visualized.
The pressure dynamics of the CSF suggests that when blood is injected in the epidural space, the pressure becomes positive and compresses the dura, increasing the adjacent subarachnoid pressure and through continuity the intracranial pressure,(5) therefore high volumes of blood injected to fast or too high in the spine (cervical) can also case complications like subdural hematomas.(9) The diagnostic approach to suspected SIH should begin with obtaining an accurate history about the clinical features of headache as it relates to the patient's posture.(3) SIH headache can be diagnosed with clinical criteria an non invasive Radiological procedures (cranial MR, spinal MR or MR myelography (1) Non of the diagnostic tools have showed distinct superiority in predicting a favorable clinical outcome. (3) It is important to properly diagnose postural headaches so that posterior interventional procedures can be avoided as they may worsen the original pathology.

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