

Epidural Blood Patch for Headaches after Endoscopic Third Ventriculostomy.

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Citation

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Abstract

A case of low pressure headache after an endoscopic third ventriculostomy treated with epidural blood patch is presented in this report. The patient presented with a severe debilitating headache that interfered with his daily activities. He was evaluated with an MRI cine study that showed free flow through the ventriculostomy, and a lumbar puncture with an opening pressure of 6cmH₂O. Initial treatments were narcotics, hydration and caffeine without resolution of symptoms. The patient was then seen by anesthesia and an epidural blood patch was thought to be appropriate, due to the pathophysiology of her current debilitating symptom. An uneventful epidural blood patch was done, with immediate resolution of the present symptom. Epidural blood patch may be useful in the treatment of low pressure headaches of etiologies other than secondary to lumbar or thoracic punctures. Implication Statement: Anesthesiologists are sometimes called upon to perform epidural blood patches for patients who have had a dural tear after a procedure along the spinal column. This is a case in which a lumbar epidural blood patch helped a patient who had a hole put in his third ventricle.

INTRODUCTION

Epidural blood patch (EBP) is the treatment of choice for low-pressure post epidural puncture headaches (PEPH).

The mechanism of action is not completely understood.

One theory is that the blood volume and inflammation in the epidural space increases the intracranial pressure, thus almost immediately correcting the symptoms.

Severe headache is a rare complication of endoscopic third ventriculostomy (ETV), usually related to increased intracranial pressure.

We describe a case of ETV complicated by postop low-pressure headache successfully treated by EBP.

CASE DESCRIPTION

The patient is a 37-yr-old man with a long standing history of non-communicating hydrocephalus, that over the course of his life has required 83 revisions for various reasons including infections, and nonfunctioning shunts and valves.

Neurosurgery decided to perform an Endoscopic Third Ventriculostomy (ECT), for which a perforation was created in the floor of the third ventricle to ensure the flow of cerebral spinal fluid (CSF). Now he no longer required

artificial material or valves to prevent the accumulation of CSF and formation of hydrocephalus. The operation was a success and the patient no longer suffers from increased intracranial pressures (ICPs).

Unfortunately the recovery was complicated by headaches.

The headaches were worse while standing and ambulating and improved in the supine position. He reported that the pain was bilaterally temporal. He complained also of photophobia. The pain in his head was quite debilitating and he was unable to perform his normal activities.

Because of lethargy he was admitted to the hospital for evaluation.

An MRI cine study showed that the flow through the ventriculostomy was patent and adequate. The patient had a lumbar puncture and the opening pressure was 6 cmH₂O.

This was initially treated with percocet, hydration and caffeine therapy without improvement.

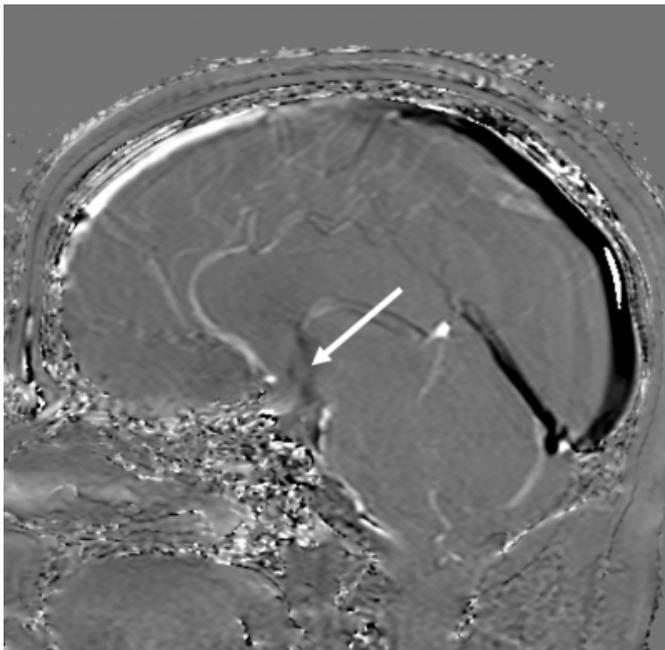
A month after the surgery, after he had tried conservative therapy and was unsuccessful, anesthesia got involved.

His case was unique, however due to the familiar etiology of his headaches a EBP would probably help his symptoms.

After informed consent he agreed and we went to the operating room to perform his procedure. He was laid prone, then prepped and draped in the normal sterile fashion over the lumbar area and an 18 gauge Touhy needle was inserted in the epidural space at L2-L3 using loss of resistance technique with normal saline. We confirmed epidural placement with injection of 1 cc of omnipaque contrast. We then removed 12 cc of venous blood from his hand, which had also been prepped and draped, and injected it into his epidural space. The patient reported no immediate change as he was lying supine and the headache was not bothering him. He was then returned to the supine position and instructed to lay flat for one hour. He was then allowed activity ad lib. Later the same day the patient reported having a great improvement in his headache and was discharged from the hospital two days later.

Figure 1

Figure 1: MRI CSF flow CINE study, sagittal view of free CSF flow through third ventriculostomy. (Acknowledgment Dr. Markovic Radiology MetroHealth Medical center)



DISCUSSION

Epidural blood patch was first suggested in 1960 by Gormley[1], and then first performed by DiGiovanni and Dunbar [2], with the objective of relieving the symptoms of severe PEPH. Two theories have been suggested regarding the etiology of pain: The first is that of reflex meningeal vasodilation secondary to loss of CSF pressure. The second one is that in the upright position traction will occur on cranial nerves and meninges.

Also two theories have been proposed as the mechanism by which the EBP works.

The first that of a tamponad effect on the dural defect and the second is elevation of the subarachnoid pressure, MRI evidence shows a mass effect after injection of epidural blood, with gradual resolution over about 7 hours. [3,4]

The use of EPB for other than PEPH has been documented in the literature in patients with accidental dural puncture, without symptoms, which might benefit from prophylactic EBP, however there is insufficient evidence to support this practice. [5]

Is also reported the use of this technique in-patient with spontaneous intracranial hypotension syndromes, weather be of unknown etiology or after exercise [6]. However all of these references are case reports or series, which do not allow a definitive recommendation.

Endoscopic third ventriculostomy, consist of the creation of a artificial communication from the floor of the third ventricle to the pre-pontine cistern, to allow the flow of CSF in patients with non-communicating hydrocephalous. [7] Reported complications are hematoma and contusion at the operative site, subarachnoid hemorrhage, death, meningitis, oculomotor palsy [8] and cases have been reported of cerebrospinal fluid leak [9].

This is an unexpected complication of this procedure, and we believe this is the first case report of EBP being used for to manage it.

As described before EBP has been used for spontaneous intracranial hypotension, with variable success, although large patient numbers are not found in previous experiences, the overall success of EBP is less frequent than that observed when known meningeal puncture is involved [10]. However appears to be a reasonable approach, since the likelihood of resolution of symptoms with EBP in the long term is greater than those treated with conservative measures [11]

Similar to those patients with PEPH, most SIH resolve spontaneously, and some might benefit from steroids [12], supine position, or caffeine. No definitive evidence is available to recommend its use.

In our patient, the theory is that increased CSF pressure caused by the EBP, for a prolonged time, ceased or slowed the pathologic process, probably a CSF leak from previous procedures.

The mechanisms of how CSF is produced, and its pressure regulated are not completely understood. The possible mechanism of how the EBP initially intended for an unrelated condition could have helped this patient are partially explained by the theories exposed above.

SUMMARY

This patient presented with an unusual complication from a neurosurgical procedure, and when anesthesia was involved we were able to recognize the similar physiopathology of a well know condition in our field of practice, the PDPH. And although evidence is absent the patient benefited from this common procedure in an unusual situation.

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