



Spontaneous Superior Sagittal Sinus thrombosis after Lumboperitoneal Shunt Insertion for Pseudotumor

Cerebri

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Introduction

Pseudotumor cerebri is a condition of raised intracranial pressure without clinical, laboratory, or radiographic evidence of intracranial pathology. It is associated with headache, papilledema, and visual deterioration that may culminate in blindness. Other symptoms are pulsatile tinnitus and diplopia. It typically presents in obese females of childbearing age. When medical therapies such as fluid and salt restriction, carbonic anhydrase inhibitors, weight loss and serial lumbar punctures fail, surgical options are considered including lumboperitoneal (LP) or ventriculoperitoneal shunting and optic nerve fenestration (7,8).

We present the case of a patient who developed a cerebral sinovenous thrombosis (SVT) following LP shunt. In this case report, we discuss different factors which may have contributed to the development of this unique complication in treating pseudotumor.

Case Report

A 24 year old female with a one year history of headaches and blurry vision was found to have papilledema and elevated opening pressure by lumbar puncture with normal imaging studies. The patient was treated with acetazolamide and serial lumbar punctures, without sustained relief of her headaches.

She presented for evaluation for LP shunt when she was eight months pregnant with the chief complaints of headaches and diplopia. She had mild papilledema, otherwise her neurological exam was normal. As she was pregnant at the time, she was treated with serial lumbar punctures, with a plan for optic nerve fenestrations should her vision deteriorate. Five months post-partum, the patient underwent a LP shunt insertion which was complicated by symptomatic over-drainage requiring a distal revision on post-operative day 2.

Figure 1: CT Venogram



Post-op Day 2 a flow void in the middle third of superior sagittal sinus is demonstrated

Two days after the revision surgery, she developed a severe headache that was no longer postural in nature. Imaging studies demonstrated an acute superior sagittal sinus thrombus (Fig. 1). The patient was transferred to the intensive care unit and therapeutic intravenous heparin was initiated. A hypercoagulable workup was negative. The patient remained neurologically stable throughout the hospital stay and was discharged home feeling well on warfarin seven days later. On follow up, she is doing well, her headaches have resolved and remains on chronic anticoagulation.

Discussion

Lumboperitoneal shunting is a common efficacious procedure for the management of pseudotumor cerebri. In large reviews (5), the most common complication of LP shunting was obstruction, accounting for 65% of revisions. Other less common complications are infection, low-pressure headaches, acquired Chiari 1 malformation, syringomyelia, subdural hematomas and shunt migration (2)

To our knowledge, this is the first report of cerebral SVT occurring in the immediate post-operative course of a patient undergoing a LP shunt with a negative hypercoagulable profile. Our patient did possess several risk factors that are associated with a hypercoagulable state including obesity, recent surgery, occasional smoking, and use of an intra-uterine device (progesterone only). Recent pregnancy is also a risk factor, but the risk of developing a SVT during the puerperium occurs within the first 7 postpartum days (1), and our patient was five months post partum. The timing of this patient's presentation suggested to us that it was directly related to her recent surgeries.

Over a short period of time the patient went from having intracranial hypertension to a state of relative and symptomatic intracranial hypotension due to cerebrospinal fluid (CSF) overdrainage with her initial lumbar peritoneal shunt. During this latter state, she likely experienced venous engorgement as part of her physiological compensation for the pressure drop. Such dilation would have resulted in decreased blood flow through the affected area. Indeed, blood velocities in the straight sinus have been shown to decrease by almost 50% as measured by transcranial doppler in patients who undergo lumbar punctures for up to at least 6 hours after the procedure (4). This theory is supported by at least 2 case reports in the literature in which patients developed a SVT immediately following unintentional lumbar puncture during the administration of epidural anesthesia (3,6). In both cases patients were in the immediate postpartum period, confounding the potential etiology in these patients.

Conclusions

To our knowledge, this is the first reported case of superior sagittal sinus thrombosis as a complication of LP shunt insertion for pseudotumor cerebri. Although this patient did have several risk factors associated with SVT, we believe that the change in the patient's CSF dynamics may have played a role in the development of this immediate post-operative complication. As the clinical picture and neurologic exam in SVT can be very nonspecific, and the condition itself potentially fatal, this case highlights the need to maintain a high index of suspicion in the post-operative course of similar patients.

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