

# Epidural Blood Patch for Headache After Lumboperitoneal Shunt Placement

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Headaches complicating lumboperitoneal (LP) shunt placement have been attributed to shunt failure with resultant high intracranial pressure or to overdrainage with resultant low intracranial pressure. In this case, a 17-yr-old girl had symptoms of a low-pressure headache after LP shunt placement alleviated by an epidural

blood patch. The success of this therapy suggests postdural puncture as a possible cause for low-pressure headache after LP shunt placement. Epidural blood patch may be an alternative initial therapy for some low-pressure headaches after LP shunt placement. (Anesth Analg 2005;101:1497-8)

**T**he cause of headache after lumboperitoneal (LP) shunt placement has been attributed to shunt failure with resultant high intracranial pressure or to overdrainage with resultant low intracranial pressure (1-3). Headaches caused by shunt failure (high-pressure headache), typically present in the same way as preshunt headaches, and those caused by shunt overdrainage (low-pressure headache) resemble a postdural puncture headache (PDPH) having a strong postural component (1). We present a case of low-pressure headache after placement of an LP shunt treated with an epidural blood patch, thus suggesting an alternative cause for headaches after LP shunt placement.

## Case Report

A 17-yr-old girl with pseudotumor cerebri had persistent headaches and increased cerebrospinal fluid (CSF) pressure over a 1-mo period before admission, despite placement of a ventriculoperitoneal shunt 1 yr before. Her medical history was significant for hypothyroidism, for which she took levothyroxine. Her physical examination and laboratory values were unremarkable. There were no imaging studies within the year before admission. Computed tomography scan of the head performed 1 yr before admission was unremarkable. The patient underwent placement of an LP shunt under

general anesthesia at the L3-4 level using a Spetzler LP shunt kit (Integra Neurosciences, Plainsboro, NJ). Later that day, she complained of a postural frontal/occipital headache accompanied by nausea and vomiting. An abdominal binder was applied, and she received Vicodin, acetaminophen, morphine, metoclopramide, and ondansetron to treat her symptoms. Despite these measures, the headache remained unchanged.

Because the patient's clinical presentation was indistinguishable from that of a PDPH, it was postulated that the origin of the symptoms was CSF leakage around the LP shunt catheter. The patient was treated conservatively with caffeine and bed rest for 24 h without improvement in symptoms. An epidural blood patch was performed on postoperative Day 4 at the L4-5 interspace. Under full sterile precautions, including 1 g of cefazolin IV, the epidural space was cannulated with an 18-gauge Tuohy needle, and 20 mL of blood, withdrawn from an antecubital vein in a sterile manner, was injected into the space. Shortly thereafter, the patient was able to ambulate without any recurrence of her headache and was discharged later that day. There were no long-term sequelae from the blood patch.

## Discussion

We present a case of low-pressure headache after LP shunt placement successfully treated with an epidural blood patch. The incidence of low-pressure headache after placement of an LP shunt is 15%-20%, with the cause being attributed to shunt overdrainage (2,3). Headache presumably results from low CSF pressure caused by shunt overdrainage. Low-pressure headaches after LP shunt placement are usually treated by shunt revision or replacement. In one case series, low-pressure headaches were the second most common reason for shunt revision or replacement (2).

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This case suggests that PDPH is a possible cause of low-pressure headache after LP shunt placement. The clinical presentations of PDPH and low-pressure headache after LP shunt placement are indistinguishable. Computed tomography myelography, retrograde radionuclide myelography, cisternography, or thin section magnetic resonance imaging could potentially diagnose a CSF leak secondary to postdural puncture, but these studies were not performed because we wanted to determine the therapeutic potential of an epidural blood patch (4). In this case, a 14-gauge Tuohy needle with a 1.6 mm outside diameter (OD) was used to access the subarachnoid space with subsequent placement of a 1.5 mm OD LP shunt catheter. The size difference between the Tuohy needle and the catheter could have allowed CSF leakage around the catheter and PDPH. An analogous situation is the placement of intrathecal epidural catheters after inadvertent dural puncture while performing epidural anesthesia. Placement of catheters in the dural puncture hole decreases the incidence of, but does not completely prevent, PDPH (5,6). Perhaps many of the low-pressure headaches after LP shunt placement that have been attributed to shunt overdrainage were actually caused by CSF leakage around the catheter.

Epidural blood patches performed after "wet tap" during epidural catheter placement or spinal anesthetics have a 70%–98% success rate (4). Although it is unclear to what degree a placebo effect contributes to this success rate, it seems plausible that a blood patch could resolve some low-pressure headaches after LP shunt placement, given the theoretical possibility of CSF leaking around the catheter. The cost savings of preventing unnecessary LP shunt revisions for overdrainage could be significant, and the risk of an epidural blood patch compares favorably with the risk of reoperation (3,7). Common complications of epidural blood patch include back or neck pain and transient fever. More serious, rare complications such as bleeding, infection, and arachnoiditis may also occur (7). A

randomized, controlled trial could determine the risk-benefit ratio of epidural blood patch for low-pressure headache after placement of LP shunts.

Some additional aspects of the case are noteworthy. Entrance of the epidural space at the shunt level was avoided to prevent catheter dislodgment. Also, a 20 mL volume was chosen for the blood patch because this volume has been reported to result in the most frequent success (4). Finally, measures to prevent secondary infection of the LP shunt were taken, including full sterile precautions and prophylactic antibiotics.

In summary, a case of PDPH after LP shunt placement treated successfully by an epidural blood patch was presented. Further study is required to determine whether epidural blood patches are a suitable alternative initial therapy for low-pressure headaches after LP shunt placement.

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