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Treatment of a Duro-cutaneous Fistula Secondary to Attempted Epidural Anesthesia with an Epidural Autologous Blood Patch

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Several cases of duro-cutaneous fistula following attempted entry into the subarachnoid or peridural spaces in the lumbar region for diagnostic, therapeutic, or anesthetic purposes have been reported.¹⁻⁴ We describe a case in which the duro-cutaneous fistula was treated successfully using an autologous blood patch epidural.

REPORT OF A CASE

A 43-year-old woman (G₁P₀) was admitted in active labor. After initial history and physical examination revealed no apparent contraindications to regional anesthesia, the patient was placed in the left lateral position and prepared for continuous epidural anesthesia. An initial attempt to identify the epidural space was made in the midline of the L3-4 interspace using a 17-g Tuohy needle and the hanging drop technique; bone was encountered on this attempt. The needle then was withdrawn, and a second attempt was made at this same interspace (again using hanging drop technique). This attempt resulted in a free flow of clear fluid from the needle, and the needle was removed. A third attempt was made one interspace lower, using the loss-of-resistance technique. No CSF or blood was encountered; a test dose of 2 ml 0.25% bupivacaine was given through the needle without effect, and the catheter then was introduced without difficulty. After a second test dose was given through the catheter, continuous epidural anesthesia was begun. Delivery was uneventful, but analgesia during that time was described as "spotty perineal." The epidural catheter was removed in the delivery room postpartum and the patient transferred to the recovery room.

Approximately 18 h postpartum she complained of a headache and the ward nurse noticed "a wet spot about 6 inches wide" in the bed beneath her lumbar region. Her severe frontooccipital headache was relieved only partially by recumbency. She denied diplopia. Examination of her back revealed three apparent puncture sites: two in the L3-4 interspace and one in the L4-5 interspace. Clear fluid was drip-

ping from one of the sites at L3-4 at a rate of 10-12 drops/min (with the patient in the left lateral position). The fluid was tested for glucose using a Dextrostix[®] reagent strip and found to contain 80-120 mg/dl glucose. The patient then was transferred back to the recovery room, where a surgical prep with povidone iodine was done on the lumbar and right antecubital regions. With the patient in the right lateral position, sterile drapes were applied and two attempts to identify the epidural space using the loss-of-resistance technique in the midline of the L2-3 interspace were made. On both occasions free flow of clear fluid was encountered at the same moment that loss of resistance was obtained. Moreover, after encountering fluid during the second attempt, the Tuohy needle was slowly and carefully withdrawn, while alternately aspirating and testing for loss of resistance; resistance was encountered at the same point where fluid no longer could be aspirated. The needle was removed and the patient positioned in the sitting position and repped and draped. A third attempt to enter the epidural space via the midline in the L2-3 interspace was made using the loss-of-resistance technique; no CSF return was noted in the sitting position. In retrospect, the fluid obtained following loss of resistance probably represented an epidural "pool," which was drained by gravity in the sitting position.

Autologous blood, 10 ml, then was injected via the needle into the epidural space. The needle then was flushed with 2 ml sterile saline and removed and the area sterilely dressed. Over the following 30 min, the patient received 2 l of Plasmalyte A[®] iv with dramatic improvement in her headache. No significant changes in blood pressure or pulse were noted following the administration of this solution.

Following the blood patch, the patient remained afebrile and asymptomatic during 3 days of in-hospital observation, and she was discharged with instructions to contact us immediately if any new symptoms developed. On follow-up appointments she has continued to be asymptomatic and has had no difficulty in keeping the rigorous pace of a new mother.

DISCUSSION

Duro-cutaneous fistula following attempted entry of either the subarachnoid or peridural spaces is a very rare event. Factors were present in the only three other cases reported¹⁻³ that could alter wound healing: 1) use of steroids in the peridural space, with possible deposition

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of steroids in the needle tract^{1,2}; and 2) multiple attempts at entry of the space using the same needle, perhaps resulting in fibrin deposition along the tract.³ Additionally, there are also two cases of fistula formation between the subarachnoid and peridural spaces^{2,4}; in one of these two cases, peridural steroid injection also might be implicated in the fistula formation.²

Several approaches have been used for treatment for this complication. Ball *et al.* treated their patient with antibiotics, oral glycerol, fluid restriction, and a figure-of-eight suture at the skin site of the CSF leak¹; Dougherty *et al.* attempted epidural blood patch, bedrest, scarification, and primary closure of the skin leak—all without success.² Jawalekar and Marx treated their patient with bedrest in the lateral position.³ Brown and Jones used Cushing clips applied during lumbar laminectomy to stop the CSF leak in their patient.⁴ We elected to try epidural autologous blood patch in our case, since the CSF leak persisted in the lateral positions. We felt that the risks of meningitis² were probably no greater with epidural blood patching after a “surgical prep” than the risks associated with a prolonged duro-cutaneous leak.

Epidural blood patch has been used on many patients to relieve headache after postlumbar puncture. The true incidence of major complications following this procedure, however, has not been reported. Abouleish *et al.*⁵ reported two patients who suffered neurologic deficits following epidural blood patch: a right facial weakness developed in one 4 days after the patch, which gradually improved, and episodic dizziness, ataxia, vertigo, and tinnitus, developed in the second after her patch. Adhesive arachnoiditis has been proposed as a theoretic complication of the subarachnoid administration of blood,^{5,6} but Ozdil and Powell injected blood into the subarachnoid space as prophylaxis against spinal headache without neurologic sequelae,⁷ and DiGiovanni *et al.*⁶ stated “Literally thousands of patients everyday sustain a spontaneous subarachnoid hemorrhage without developing arachnoiditis.” Other complications following epidural blood patch include fever (5%), backache (35%), and neckache (0.9%).⁵

In summary, we described a case of duro-cutaneous fistula following multiple attempts at epidural anesthesia,

which was treated successfully with an epidural blood patch. We found this technique to be safe, effective, and less troublesome than previously reported treatment modalities.

Duro-cutaneous fistula formation is associated frequently with multiple attempts to enter the subarachnoid or peridural space made with the same needle or percutaneous injection of steroids into the peridural space. It obviously is prudent to avoid multiple attempts at entry. We heartily agree with the recommendation of Jawalekar and Marx³ that if multiple attempts are made with the same needle, it should be cleansed thoroughly before reinsertion to minimize deposition of fibrin or other material along the needle tract. When feasible, another interspace should be used. Since steroid deposition along the needle tract also has been implicated in the etiology of duro-cutaneous fistula formation, it also seems prudent to avoid percutaneous injections of steroids into the peridural space. If steroids are injected, the needle should be cleared with a few milliliters of sterile preservative-free saline prior to withdrawal to prevent deposition of the steroid along the needle tract.

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