Lumbosacral meningismus complicating subdural injection of "blood patch"

Case report

HAROLD A. WILKINSON, M.D.

Department of Neurosurgery, University of Massachusetts Medical Center, Worcester, Massachusetts

The published literature suggests that the technique of epidural “blood patch” injection is both safe and effective for the treatment and prevention of headache after spinal puncture. However, a case is reported in which the complications following a “blood patch” outweighed the disability and discomfort produced by the headache itself. The etiology is believed to have been inadvertent injection of blood into the subarachnoid space.

KEY WORDS • “blood patch” • headache • subarachnoid blood • spinal puncture

Epidural injection of fresh whole autologous blood (“blood patch”) has been recommended for treatment of persistent internal leakage of cerebrospinal fluid following spinal puncture. Previous reports have stressed the efficacy of this procedure, and have minimized its complications. We have recently encountered a patient who was disabled far more severely by the “blood patch” than by her initial headache after spinal puncture.

Case Report

On April 6, 1979, this 29-year-old woman underwent varicose vein ligation under spinal anesthesia at another hospital. A severe, positional type of postspinal puncture headache developed when she attempted to walk, and it failed to remit despite bed rest, intravenous hydration, and oral Priscoline (tolazoline). On April 10, her anesthesiologist performed a lumbar puncture. After encountering cerebrospinal fluid (CSF), he withdrew the needle slightly, then injected 12 cc of fresh whole autologous blood. His progress note states: “headache relief, but backache as expected.” Within the next 2 hours, the patient developed severe pains in her lower back and both legs. This was treated with analgesics and diazepam. Over the subsequent 9 days, back pain diminished, but pains in her coccyx and the posterior aspects of both thighs remained quite severe. She noted no definite sensory loss or weakness. There was some urinary urgency but no incontinence. Pain was severely aggravated by activity or when she lay on her abdomen or back.

The patient was examined for the first time at the University of Massachusetts Medical Center on April 19. She complained of several days of increasingly severe sacroccygeal and bilateral posterior thigh pains. Oral temperature was 37.7°C. She was pale and slightly diaphoretic, and appeared acutely ill and uncomfortable. Neck flexion caused low-back pain, but pain was not elicited by Valsalva maneuver or by jugular compression. Any back bending or hip movement elicited complaints of severe sacroccygeal pain. There was tenderness in response to percussion but not to local pressure over the lumbosacral junction; there was no obvious cutaneous redness, heat, or swelling. Motor power, sensation, and deep tendon reflexes were objectively intact in both lower extremities and the saddle area, despite limitations imposed by her severe discomfort.

Blood tests showed hemoglobin 12 gm%; white count 7200 with 64 polymorphonuclear cells, 9 bands, 24 lymphocytes, 1 monocyte, 1 eosinophil, 1 basophil; Zeta sedimentation rate 61%; platelet count 285,000;
prothrombin time 12.9/12.0 seconds; 37.5 seconds partial thromboplastin time.

Because of the strong diagnostic possibility of epidural or subdural abscess, the patient was taken immediately to the x-ray department. Under fluoroscopic control, epidural aspiration was attempted at L5-S1. Only cloudy orange CSF was obtained. This fluid contained a protein content of 231 mg%, a glucose level of 25 mg%, 17,000 red cells, and 50,000 white cells (20% polymorphonuclear cells, and 80% lymphocytes). Injection of 5 cc of air yielded a confusing picture with an irregular filling pattern. A second spinal needle was inserted at L2-3. The fluid drop technique for epidural space entrance was used, but no fluid was spontaneously inspired. Instead, yellowish CSF was immediately encountered. On analysis, this contained a total protein content of 113 mg%, a glucose level of 30 mg%, 1150 red cells, and 100 white cells (16% polymorphonuclear cells, and 84% lymphocytes). Aerobic and anaerobic cultures of CSF from both sites were negative. Although the potential increased risk of admixing Pantopaque with bloody CSF was recognized, it was thought that the equivocal findings on attempted air myelography were sufficiently suggestive of epidural abscess to warrant the introduction of Pantopaque. Accordingly, 9 ml of Pantopaque was injected through the upper needle puncture. This showed a small irregular dorsal filling defect extending from L-3 to L-5, which was not diagnostic of abscess. At the conclusion of the procedure, all of the Pantopaque and 25 ml of deeply xanthochromic CSF were withdrawn from the L5-S1 needle. Before removal of the two needles, 60 mg (0.75 ml) of Depo-Medrol (methylprednisolone acetate) was injected intrathecally. Following this procedure, the patient's symptoms improved dramatically, and she developed no headache. She was gradually allowed out of bed and was discharged home on April 23.

Over the next 2 months, residual low backache improved partially with ibuprofen administration and exercise, although she continued to complain of urinary urgency and some dribbling without incontinence. She noted some impairment of normal sexual sensation during intercourse. Eight weeks after her aspiration procedure, she developed increasing low backache with tingling in the anterior aspect of the legs and increasing stress incontinence. Neurological examination remained objectively intact, but there was mild limitation of range of back motion. Urological examination showed no evidence of neurogenic bladder dysfunction. Because of increasing symptoms, spinal puncture was repeated on July 11, 1979. The CSF was clear but faintly yellowish, containing a protein content of 47 mg%, a glucose level of 43 mg%, 111 red cells, and 12 lymphocytes. Sixty mg (0.75 ml) of Depo-Medrol was injected intrathecally. Again she tolerated the procedure quite well and again developed no headache. Discomfort and tingling gradually improved following this procedure, and 7 weeks later only mild coccygeal ache and mild impairment of urination and sexual sensation persisted.

Discussion

Gormley first described the epidural “blood patch” technique for treatment of postspinal puncture headache in 1960. The usefulness of this technique has been confirmed by subsequent authors and by my personal observations in a small series of patients. Prophylactic application of “blood patches” to prevent headaches following spinal anesthesia was endorsed by Ozdil and Powell in 1965. Gutterman and Bezir confirmed similar prophylactic use of the “blood patch” in the prevention of postmyelogram headaches.

Although the efficacy of the technique has been confirmed in the treatment and prophylaxis of postspinal puncture headaches, little has been written specifically about the potential complications of the procedure. Shantha, et al., reported one case out of 202; their patient developed back and bilateral leg pain with local tenderness at the puncture site and mechanical signs of nerve-root irritation, but had no neurological loss. Their patient’s symptoms began 2 to 3 hours following “blood patch,” and had totally cleared within 5 days after treatment with oral corticosteroids, diazepam, and propoxyphene. The etiology of their patient’s symptoms was unclear, but they were probably secondary to epidural compression of the nerve roots or to subarachnoid ingress of blood from the epidural space through spinal arachnoid villi around the nerve roots. Although no other specific complications have been reported in relation to this procedure, Glass and Kennedy described occasional “transient tinnitus as the blood is injected and mild backache at the puncture site, lasting 24 to 48 hours” in a series of “over 50” patients. Gutterman and Bezier confirmed that many of their patients developed transient low-back pain which was “not troublesome.” The present case is the first reported in which severe and persistent lumbosacral meningismus developed following injection of a “blood patch.”

Accurate identification of the epidural space can be difficult in patients suffering from postspinal puncture headaches, since CSF can at times be obtained from subdural and even epidural spaces. Having once obtained spinal fluid, partial withdrawal of the needle until flow ceases does not guarantee that the needle opening has been fully withdrawn into the epidural space. In the patient presented here, the blood which was injected entered the subarachnoid space where it loculated to produce an acute and slowly clearing chemical meningitis, as confirmed on subsequent lumbar punctures. That blood acts as a “chemical” irritant in the subarachnoid space is amply documented in neurosurgery, accounting for the meningismus, neck stiffness, fever, and CSF pleocytosis seen following spontaneous subarachnoid hemorrhage.
Meningismus complicating "blood patch"

References


Address reprint requests to: Harold A. Wilkinson, M.D., Department of Neurosurgery, University of Massachusetts Medical Center, 55 Lake Avenue North, Worcester, Massachusetts 01605.