Intracranial subdural hematoma following lumbar myelography

Case report

Saeid Ale Mohammad, M.D., and William F. Bouzarth, M.D.

Department of Neurosurgery, Episcopal Hospital and The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Persistent headaches after lumbar puncture or myelography can be due to intracranial hematoma. This possibility should be evaluated by computerized tomography, keeping in mind the difficulty in the diagnosis of the isodense subdural hematoma.

**Key Words** - myelography □ subdural hematoma □ persistent headache □ computerized tomography

Complications of invading the lumbar theca for diagnostic purposes are a matter of common knowledge. Local neural injury, infections, damaging effects of contrast media locally and at a distance (arachnoiditis), as well as spinal subdural and epidural hematomas have been reported. This report adds intracranial subdural hematoma as another, but rare, complication.

**Case Report**

This 40-year-old self-employed businessman had intermittent lower back pain and left sciatica for 4 years. A lumbar myelogram using a No. 18 spinal needle was performed. Nearly all of the 9 ml of Pantoopaque (iophendylate) was removed. The needle remained inserted throughout the procedure so that the dura was only penetrated once. After the myelogram, which was considered normal, the patient complained of severe headache and a mildly stiff neck. It was our impression that these symptoms were due to lumbar puncture. He was hydrated with intravenous 2½% glucose and 0.5 cc normal saline, and treated with intramuscular caffeine sodium benzoate. The symptoms improved but did not disappear. He was discharged 3 days after the myelogram.

Four weeks later he returned complaining of persistent, intractable headache with nausea and vomiting. Neurological examination was normal except for a slightly stiff neck. The patient was readmitted for repeat lumbar puncture. The opening pressure was 120 mm H₂O; the cerebrospinal fluid (CSF) cell count and chemistries were normal. After this lumbar puncture, he again received intravenous fluid and caffeine sodium benzoate, and again showed some improvement. Two weeks later, he returned because of headache, but he now complained of decreased vision, double vision, and occasional pain in the right eye. Neurological examination revealed bilateral abducens palsy and bilateral papilledema with peripapillary hemorrhages. Computerized tomography (CT) demonstrated small lateral ventricles and diminution of the cortical sulci. After contrast enhancement, there was a suggestion of an inner membrane of bilateral chronic subdural hematoma (Fig. 1). Carotid arteriography confirmed the diagnosis (Fig. 2). Small bilateral temporal craniectomies were performed. Motor oil-like fluid was drained from the subdural space. Postoperatively, the headache improved, but the papilledema was unchanged. On the 7th postoperative day, repeat CT showed residual bilateral subdural hematoma, now more posterior in location. Bilateral posterior parietal craniectomies were performed. Again dark fluid, the consistency and color of motor oil, was drained. The postoperative period was uneventful, and 6 weeks later the papilledema was gone and CT was normal. The patient was now symptom-free and has remained so.
Discussion

Headache is the most common complaint after lumbar puncture, and it is believed to be due to CSF leakage. Levine and White reported a patient with an 8-month period of postmyelographic headache. Cisternal injection of iodinated serum albumin demonstrated CSF leakage in the lumbar area. An autologous epidural blood patch cleared the symptoms for 2 months. Since repeat injection of a radionuclide failed to demonstrate extra-arachnoid extension, they assumed the second episode of headache was due to a "psychophysiological reaction." No studies were done to rule out the formation of subdural hematoma. Jensen studied plain x-ray films taken after myelography and revealed a 27% incidence of epidural extravasation of Pantopaque. Certainly, the less viscous CSF would also leak out. Glass and Kennedy were able to cure headaches after lumbar puncture by injecting epidural blood, and our former colleagues reported the beneficial effect of autologous epidural blood in preventing postmyelographic headache. If it had not been for the abducens palsy and the papilledema, we would have recommended this treatment.

Even though it is well known that subdural hematomas occur without a history of trauma, or after only trivial injury, we were not convinced, even when CT suggested bilateral convexity isodense subdural hematomas. The history was reviewed again with the patient and his family. There was no remembrance of head impact, falls, strong Valsalva maneuvers, or violent sneezing or coughing, all having been reported to produce subdural bleeding. Laboratory studies failed to uncover a coagulopathy, which is another cause. In the adult, chronic subdural hematoma is seen most frequently in the elderly or the alcoholic, although our patient was neither. Rahme and Green, in their review of 80 patients with chronic subdural hematoma, reported that only 19% were in patients between the ages of 5 and 40 years. Further, in our patient, the only change in the headache with the passage of time was a progressive increase in intensity after myelography.

Nontraumatic subdural hematomas occur as a complication of shunting for hydrocephalus, and this is attributed to tearing of the bridging cortical-to-dura veins as the cerebral mantle collapses. This has been reported in hydrocephalic children, and in adults with normal-pressure hydrocephalus. A similar mechanism seems likely after pneumoencephalography. We have reported that in animal experiments the removal of 10 ml of CSF immediately after closed head injury increased the incidence of subdural hematoma from 10% in the control group to 60%. This finding is indirect evidence that continuing leakage of CSF could be responsible.

Our review of the literature of lumbar puncture and/or myelography indicates that intracranial subdural hematoma after either test is rare. Craigmyle and Welch mentioned such a complication but to their knowledge no case reports have been published. However, Gabriele reported on a patient who died from a subdural hematoma following lumbar myelography and discography. The patient became lethargic 5 days after the latter test and died 3 days later. Postmortem examination confirmed the sub-
dural hematoma. Our patient differs markedly in that Gabriele's patient had multiple punctures of the lumbar theca.

One wonders how often this complication occurs after lumbar puncture, since it has been demonstrated that subdural hematomas can disappear spontaneously. Some postmyelographic headaches may be, in reality, unsuspected subdural hematomas that later resolved. Now, with CT, the diagnosis can be made without invasive tests such as arteriography. However, as in our case, the isodense subdural hematoma may be difficult to diagnose, although recent reports give many clues.

Abducens nerve palsy is another rare complication of lumbar puncture. The first case of bilateral sixth nerve palsy following lumbar puncture was reported in 1941, and a second case 4 years later. However, both patients had lumbar puncture before being treated for active syphilis. There seems little doubt that the abducens palsy in our patient was secondary to increased intracranial pressure from the subdural hematoma.

Another possible explanation of the sixth nerve involvement would be the effect of Pantopaque. Taren reported on a young man who developed a febrile reaction and progressive symptoms of increased intracranial pressure approximately 24 hours after myelography. Although no organism was found, the CSF contained a high concentration of white blood cells. Trephination confirmed brain swelling, and ventriculography was normal (ventricular and cisternal cells). Trephination confirmed brain swelling, and ventriculography was normal (ventricular and cisternal cells). Trephination confirmed brain swelling, and ventriculography was normal (ventricular and cisternal cells). Trephination confirmed brain swelling, and ventriculography was normal (ventricular and cisternal Pantopaque were present on x-ray films). As the patient improved, cranial nerve abnormalities were uncovered. There was no evidence to suggest an unusual sensitivity to the contrast material. In 1952, Erickson and Baaren reported on obstructive hydrocephalus due to Pantopaque arachnoiditis, a condition that was produced in animals by Schurr, et al. Obstructive hydrocephalus is known to produce sixth nerve palsy and/or papilledema. Another patient has been reported who developed immediate pain in the orbital area with flashing lights in that eye when the Pantopaque inadvertently spilled over the clivus. Pain and visual disturbances became worse 31 days later. Skull x-ray films revealed droplets in the vicinity of the optic foramina. Since neither CT nor skull x-ray films uncovered intracranial Pantopaque in our patient, this cause is unlikely.

References

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Address reprint requests to: William F. Bouzarth, M.D., Department of Neurosurgery, The Medical College of Pennsylvania, 3300 Henry Avenue, Philadelphia, Pennsylvania 19129.