AJNR

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AJNR Am J Neuroradiol 1981, 2 (6) 589-590
http://www.ajnr.org/content/2/6/589.citation

Intravasation of Pantopaque during Myelography without Associated Traumatic Tap

Thomas E. Mais[1] and David Fortin[2]

Intravasation of Pantopaque at myelography is usually related to entry or partial entry of a spinal needle into an epidural vein. This may occur initially, while positioning a spinal needle, or during repuncture for removal of contrast agent. We observed an atraumatic lumbar puncture at the L3–L4 interspace made with a single pass, in which intravasation of contrast material occurred in the midsacral region at about S2, remote from the puncture site. The findings confirm that a pathway may exist between the spinal arachnoid granulations and the epidural venous plexus.

Case Report

A 49-year-old man with left-sided sciatic pain of 2 weeks duration was admitted for diagnostic assessment and treatment. The pain was severe, with numbness of the left leg and restriction of gait and motion. No muscle weakness or sensory defect could be demonstrated. The patient had been evaluated 6 months before with the diagnosis of "low back syndrome," and conservative treatment with bed rest and traction offered only slight benefit. However, symptoms gradually abated over a 6 week period while on restricted activity.

The patient's medical history included a cervical laminectomy 17 years before for numbness in his forearm. He was in an accident 2 years before in which he suffered fractures of both arms and torn ligaments in his right knee.

Physical examination showed restriction of motion of the left leg and restriction in bending the lower lumbar region. Lumbosacral spine films showed slight anterior wedging of T12, L1, and L2. Pertinent laboratory information included a reactive serum serology (rapid plasma reagin) at a dilution of 1:32. Cerebral spinal fluid obtained at myelography showed 190 cells/mm^3. The differential leukocyte count was 94% lymphocytes, 1% polymorphonuclear leukocytes, 2% myelocytes, 1% eosinophils, and 1% bands. Cerebral spinal fluid protein and glucose were normal. The spinal fluid fluorescent treponemal antibody absorption test was reactive. The patient had been treated for syphilis 2 years before.

The lumbar puncture at myelography the day after admission was

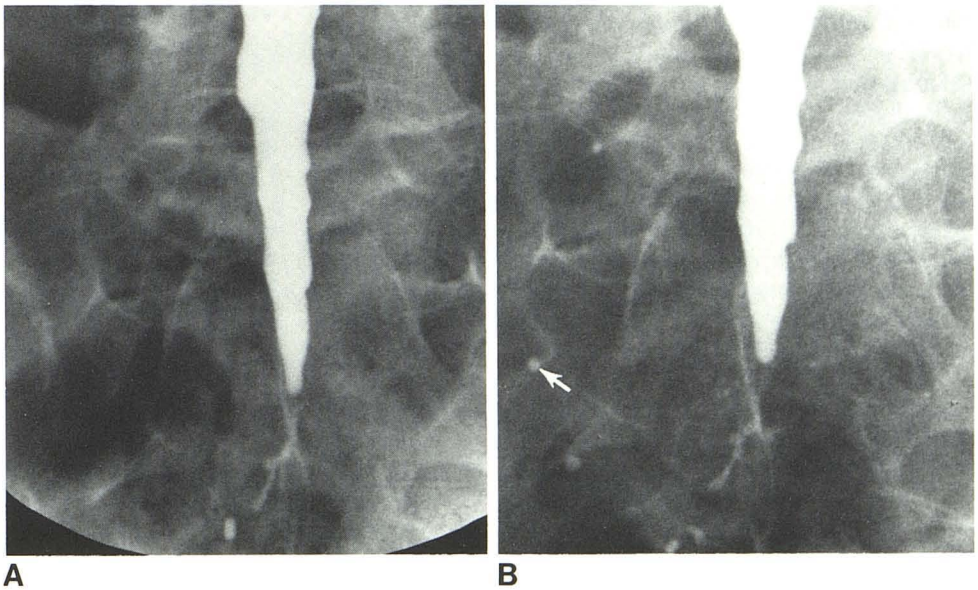

Fig. 1.—**A**, Intravenous intravasation of Pantopaque at S2. **B**, Cephalad movement of contrast material in veins (*arrow*).

Received February 18, 1981; accepted after revision July 9, 1981.
[1]Department of Radiology, Independence Sanitarium and Hospital, 1509 W. Truman Rd., Independence, MO 64050. Address reprint requests to T. E. Mais.
[2]Department of Radiology, St. Luke's Hospital, Kansas City, MO 64111.

AJNR **2:589–590, November/December 1981** 0195-6108/81/0206-0589 $00.00

atraumatic with a single puncture being made at the L3–L4 level. Contrast material was observed to flow freely in the subarachnoid space. After standing the patient upright and distending the thecal sac, contrast material was observed to enter the surrounding venous structures at about S2 and flow cephalad (fig. 1).

This flow ceased when the contrast medium was removed from the caudal end of the sac by placing the patient horizontal, but it was observed again after standing the patient upright a second time. Only a small amount of total injected contrast material was intravasated; the rest was removed at the end of the examination. The myelogram demonstrated asymmetry in the filling of the caudal sac at the L5–S1 level, suggesting a herniated disc on the left. At surgery the next day, an extruded L5–S1 disc fragment was found on the left. The patient made an uneventful recovery.

Discussion

A literature review cited by King and Khodadad [1] showed 22 cases of intravasation of contrast material during myelography. In 16 of the 22 cases, intravasation was associated with a traumatic tap, implicating puncture of a venous structure. In the other six cases, the tap was atraumatic but intravasation was still thought to be related to needle trauma.

In their report of atraumatic intravasation, Zito and Schellinger [2] believed that congenital fistula formation between the subarachnoid spinal space and the venous plexus could account for intravasation associated with atraumatic taps [3, 4].

In the Zito and Schellinger [2] case, the mechanism of intravasation was based on a preexisting connection between the subarachnoid space and the epidural venous plexus. Anatomic connections between arachnoid villi and the venous system were described by Kido et al. [3] in the thoracic and lumbar spine. Endothelial-lined tubules with pores of various size opening directly into venous structures have been demonstrated. The communication between the subarachnoid space and the venous plexus in our patient may represent a localized anomaly or transient dysfunction of the granulations described by Zito and Schellinger [2].

We believe the intravasation in our case was unrelated to a traumatic tap because of the marked difference in the level of the puncture site at L3–L4, and the sacral level of the observed intravasation was clearly unrelated to the present or any previous spinal puncture. A second needle was not used for removal of contrast material. There was no evidence of spinal dysrhaphism or other congenital deformity.

Since intravasation may be associated with embolization of contrast agent to the lungs with symptoms of cough, fever, and vascular collapse, its recognition is of some consequence. Embolization to the lungs was observed in seven of 22 cases reported in the literature [1]. The amount of intravasation may be limited by positioning the patient appropriately if it is recognized early during the study.

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