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## Percutaneous Injection of Metrizamide into Spinal Cord Cysts for Preoperative Diagnosis of Syringomyelia

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Five cases of syringomyelia are reported in which the spinal cysts were percutaneously punctured and filled with metrizamide for preoperative diagnosis. There were no side effects from the puncture or the contrast medium. In all cases the cyst was larger than had been demonstrated by previous myelography. A communication to the fourth ventricle was seen in two cases. Four patients had surgical treatment; the neurologic deficits improved in two patients, while the condition of the others has remained unchanged.

Over 50 years ago Vitek [1] described spinal cord puncture techniques in six cases of syringomyelia, in which lipiodol was

injected to demonstrate the extent of the cavities. Very few cases of percutaneous needle aspiration in syringomyelia have been published since that time. In 1980 Quencer [2] reviewed the literature and listed a total of 20 endomyelographies in 26 patients using air or oil-based contrast agents (combined in some cases with radioiodinated human serum albumin). Harwood-Nash and Fitz [3] reported four cases in which they inadvertently injected Pantopaque into a hydromyelic sac in the low lumbar cord in children. Pasquini et al. [4] inadvertently injected metrizamide into two noncommunicating intramedullary cystic tumors during myelography after lateral approach between C1 and C2. Needle aspiration and cystic filling with water-soluble contrast medium in patients with syringomyelia

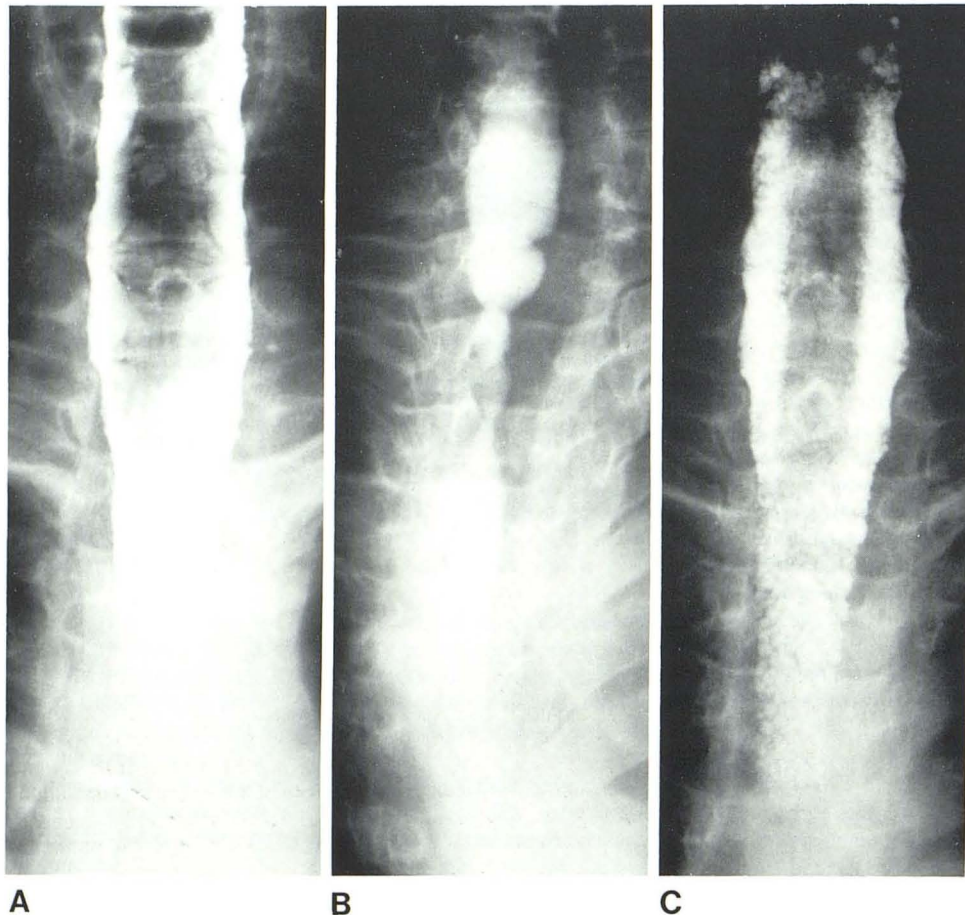


Fig. 1.—Case 1. Syringomyelia. **A**, Cervical cord myelogram. **B**, Cyst extending from C1 to T10 is opacified with metrizamide. **C**, Postoperative myelogram.

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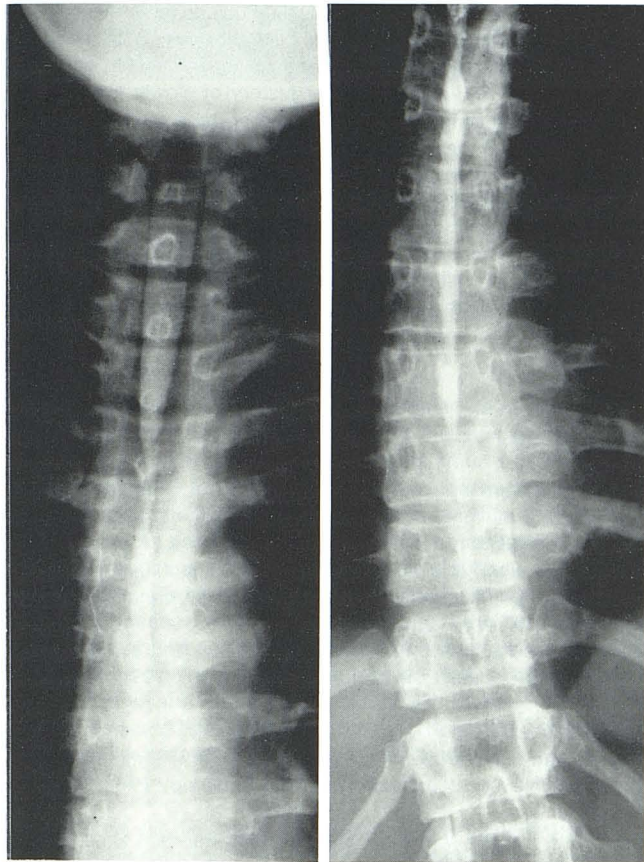


Fig. 2.—Case 2. Endomyelography of syringomyelia in young woman. Enlargement of spinal cord seen only in cervical region, but syrinx extends from C1 to T11.

has not yet been reported. (*Editor's note.*—A paper on this subject appeared recently in *AJNR* [5].)

### Subjects and Methods

Between 1978 and 1982 percutaneous endomyelography was performed in five patients with syringomyelia. All were aware of their disease and before puncture were informed about the examination and the possibility of complications. Myelography and spinal angiography of the cervical cord were performed before puncture to evaluate regional vascularity. Dorsal puncture between C2 and C3 was done in the left lateral position under fluoroscopic control, and cystic fluid was carefully exchanged for metrizamide (170 mg I/ml; Schering, Berlin). Radiography and tomography were performed during injection of the contrast medium (total dose, 1–1.5 g) and after removal of the needle. All punctures were made with a 20 gauge spinal needle (Becton-Dickinson, Heidelberg-Wieblingen) without anesthesia. Computed tomography (CT) with overlapping scans for sagittal and coronal reconstructions was performed 1–6 hr later on a Siemens Siretom 2000 scanner.

### Results

Cyst puncture was successful in all patients. Only one reported a transient burning pain in his arm as the needle entered the spinal

Fig. 3.—Case 3. CT sagittal reconstruction (negative image) of craniocervical region 6 hr after cyst puncture and instillation of metrizamide. Upper pole of cyst at C1 level. No communication between syrinx and fourth ventricle.

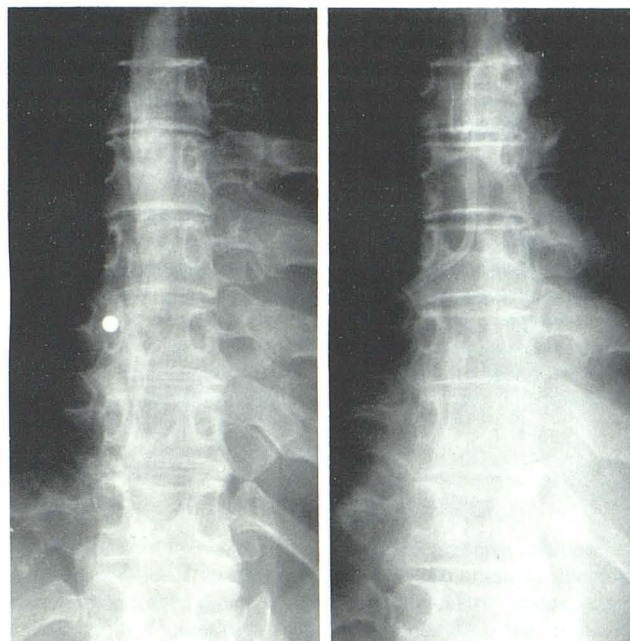


Fig. 4.—Case 4. **A**, Inferior end of syrinx is marked with lead shot on patient's skin to indicate surgical approach. **B**, After syringoabdominal shunt.

cord. The exchange of cystic fluid for metrizamide was without any side effects; excess pressure in the syrinx was avoided.

The myelograms showed the whole extent of the cavity, which was irregularly margined (fig. 1) or had a small and filiform lower end (fig. 2). Sagittal and coronal CT reconstructions of the craniocervical region showed the upper pole of the syrinx and excluded even a small communication to the arachnoid space in three cases (fig. 3). The inferior end of the syrinx was marked on the patient's skin to indicate the surgical approach (fig. 4A). One patient who had a wide communication to the fourth ventricle (fig. 5) refused surgery because a supplementary ventriculostomy was planned.



Fig. 5.—Case 5. Cyst puncture between C2 and C3. Communication between syrinx and fourth ventricle appears wider during metrizamide injection than in subsequent radiography with head tilted slightly downward (*not illustrated*).

The other four patients had surgical treatment shunting the syrinx to the peritoneal cavity 1–7 days after cyst puncture (fig. 4B).

In one patient, postoperative myelography demonstrated markedly thin spinal cord and dilated arachnoid space in the region of

the collapsed intraspinal cavity. More than 3 years after the surgery the neurologic deficits of this patient have remained unchanged. Another patient recovered except for a seismaesthesia of one arm. A third patient, who had a 20 year history of slowly progressive syringomyelia causing flaccid paraplegia of the arms, spastic paraplegia of the legs, and incontinence of urine, is now ambulatory and has experienced improvement of enuresis.

These positive results justified the preoperative cyst puncture to optimize surgical planning. However, we recommend cyst puncture only after pathologic vascularity in the cervical spinal cord has been excluded and only with a neurosurgeon in attendance in case any complications should arise.

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