

Intradural lumbar disc protrusion

A case report

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We report a rare case of intradural lumbar disc protrusion describing a specific myelographic appearance that may help in preoperative diagnosis. Most of these patients present with acute sciatica and neurologic deficit. Preoperative awareness and diagnosis is of importance because the extruded disc protrusion lies intrathecally and must be specifically looked for and removed from its intradural position.

Penetration of a lumbar disc through the dura into the intrathecal space is a very rare event. Dandy (1942) reported the first such patient. In a recent review, Lee & Fairholm (1983) reported 38 cases and added 2 cases of their own. Since then, 4 more cases have been reported by Barbera et al. (1984) and Lesoin et al. (1984).

Case report

A 38-year-old male laborer presented with a 2 months' history of moderately severe low back and bilateral sciatic pain, and a 5 days' history of weakness and numbness of his left leg. On the day of admission to the primary hospital, he had noticed a sudden exacerbation of the sciatica, weakness of the left foot, and numbness over the left leg.

When seen in our hospital, he was unable to stand because of severe pain. There was severe paravertebral muscle spasm and loss of lumbar lordosis. The straight leg raising test was positive at 30° on the right and 10° on the left side. The power in the extensors of the left ankle was Grade 3 and that of the left toes was Grade 2 (Medical Research Council Grading). Both ankle reflexes were markedly reduced. There was hyperesthesia over the L5 and S1 dermatomes on the left side.

On the day of admission, he had a metrizamide myelogram and a computerized axial tomographic (CAT) study performed. The lumbar-puncture needle was introduced at the level of the L3-4 space. The myelogram showed a complete block at the level of the L4-5 disc space with deviation of the terminal dye column posteriorly. In addition, there was leakage of the dye into the extradural space (Figure 1), separate from the site of introduction of the lumbar-puncture needle, which is distinctly shown in Figure 1. The CAT study showed a large intraspinal disc protrusion at the level just caudal to the L4-5 disc space (Figure 2) and marked compression of the theca just proximal to the L4-5 disc space.

The patient was operated on a few hours after the myelography. A left hemilaminectomy of the L4 vertebra with resection of the superior margin of the L5 lamina was performed. A piece of disc material was seen inside the spinal canal in the extradural space. The dura was retracted medially and cerebrospinal fluid was seen leaking around this fragment. The disc fragment was gently taken out. It was a large spindle-shaped piece, and on its removal a gush of cerebrospinal fluid came out and a nerve root floated into view. Microscopy was used and a large dural tear, measuring approximately 1 cm, was seen over the anterolateral aspect of the theca. Its edges were jagged; and due to its anterior location, repair with suturing was not feasible. The dural tear was covered with a large, free muscle graft and Gelsponge placed extradurally and the disc space was cleared thoroughly of degenerated disc material.

The postoperative course was uneventful. The

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Figure 1

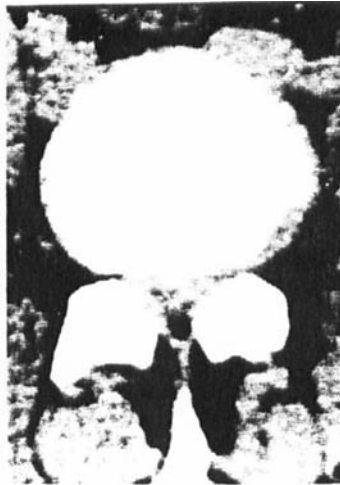


Figure 2

Figure 1. Metrizamide myelogram shows complete block at L4-5 level with posterior deviation of the dye column. There is extraradicular extravasation of metrizamide. The needle is at the L3-4 disc-space level.

Figure 2. Computed tomogram after metrizamide myelogram at the L4-5 level shows no dye in the spinal canal, which has a large amount of intraspinal disc material.

bilateral sciatic pain subsided quickly and there was gradual improvement in the sensory and motor functions. The patient was discharged from the hospital on the ninth postoperative day. When seen at follow-up 14 months later, he had no sciatic pain and no weakness. Minor hyperesthesia and occasional low back pain persisted. He was back in his previous employment.

Discussion

Most of the reported patients with intradural rupture presented with an acute exacerbation of sciatic pain and neurologic involvement, which was superimposed upon a long history of low back pain (Smith 1981, Lesoin et al. 1984). Our patient showed a similar pattern. He had bilateral sciatic pain, but motor weakness occurred on the left side only. This was the reason for the unilateral approach.

The extravasation of metrizamide, as seen on the myelogram, is an unusual finding. This leak must have occurred alongside the loose disc fragment because part of the fragment was intrathecal and part of it was lying in the extradural space. We can be certain of this because the lumbar-puncture needle was situated some 7 mm above the superior edge of the extravasation. We have not found such a description reported. It seems likely that this myelographic appearance

points to an intradural penetration by a protruded disc fragment. In addition to the extravasation of metrizamide, our patient, on myelography, showed a complete block, as most of the other patients reported (Lee & Fairholm 1983, Peyser & Herari 1977, Smith 1981, Tucker 1956).

The intradural penetration of a disc protrusion is a rare event when compared with the common condition of disc protrusion into the extradural space. Dandy (1942) reported 1 case among 300 patients of lumbar disc protrusion. Peyser & Harari (1977) reported 2 cases among 753, and Lesoin et al. (1984) reported 2 among 715 patients, giving an average incidence of 0.3 per cent.

We have found reports of 44 cases of intradural lumbar disc protrusion in the Anglo-Saxon literature (Barbera et al. 1984, Blikra 1969, Ciappetta et al. 1981, Dandy 1942, De Palma 1976, Dinkar & Rao 1971, Hodge et al. 1978, Kulowski 1967, Lee & Fairholm 1983, Lesoin et al. 1984, Lyons & Wise 1961, Pani et al. 1972, Paterson & Gray 1952, Perisic & Popovic 1962, Peyser & Herari 1977, Robinson 1965, Slater et al. 1965, Smith 1981, Teng & Papatheodorou 1964, Wilson 1962). Eighteen out of these 44 cases were at the L4-5 space, 10 were at the L5-S1 space, and the rest were almost equally distributed at the other three lumbar disc spaces (Lee & Fairholm 1983, Smith 1981). In contrast to this, only 3 cases each of intradural disc protrusions at thoracic and cervical regions have been reported.

The exact mechanism of the intradural penetration by the disc material is unknown. If the disc protrusion force becomes excessive or is maintained for a long time, then, the dura may be penetrated by a sequestered fragment; sharp points or edges in such fragments may help in the perforation of the dura (Blikra 1969). Other factors may contribute, such as adhesions and/or weakening of the anterior dura by long-standing pressure from a chronic disc protrusion (Blikra 1969, Penning & Wilmirk 1981, Peyser & Harari 1977). Blikra (1969) studied 40 postmortem cases that had never shown any clinical picture of disc herniation. He found "dense or firm adhesions" between the posterior longitudinal ligament and the dura at the L4-5 level in 24 specimens; at L5-S1 the incidence of such adhesions were less than half of this. It has been postulated that increased incidence of adhesions, either inflammatory or postoperative, may be the cause of the

frequency of the penetration of the dura at the L4-5 level (Lee & Fairholm 1983, Lesoin et al. 1984). It is also likely that such adhesions are increased by a long-standing disc protrusion at that level (Teng & Papatheodorou 1964). Penning & Wilmirk (1981) showed myelographically that maximum changes and stretching of the dura during flexion-extension occurred between L4 and L5.

Even though intradural disc herniation is a rare occurrence, the clinical presentation in most of the patients is that of multiple root damage and a complete block at myelography (Teng & Papatheodorou 1964). In our patient, extravasation of metrizamide served as a pointer to intradural penetration of disc material. In spite of compression of the cauda equina by the intradural disc fragment for 5 days in our patient, surgical removal led to a very satisfactory recovery.

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