Intradural herniation of a thoracic disc presenting as left radicular pain and left drop foot

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A 56-year-old woman was emergently transferred to our spine center after a 2-day history of left drop foot and paresthesia. Her bladder and bowel sensations were normal. She had a 2-year history of back pain that had worsened over the preceding 2 weeks with radiation to her left buttoc and leg. There was no history of trauma, fever, or previous orthopedic surgery. Examination revealed hypotonia in the left extremity. Power on the left was 5/5 in the hip and 5/5 in the knee. She exhibited 0/5 ankle dorsiflexion, 4/5 ankle plantar flexion, 0/5 extensor hallucis longus, and 3/5 flexor hallucis longus. Ankle jerk was absent on the left, and sensation to pinprick and light touch on the left was reduced in the L5 distribution. Deep sensation was also reduced on the left. Rectal examination was normal with no saddle anesthesia. Neurologic examination of the right leg and upper limbs revealed no abnormalities.

Magnetic resonance imaging (MRI) (Fig. 1) and postmyelographic computed tomography (CT) (Fig. 2) revealed displacement and compression of the lower thoracic spinal cord at T11–12 caused by a large left paracentral mass lesion. T1-weighted postgadolinium-enhanced MRI showed no enhancement of the intradural component (Fig. 1E). Although Fig. 1B and C appear to show an extradural lesion, Fig. 1D suggests an intradural lesion. Because we could not reach a clear diagnosis using MRI, we performed myelography to obtain more information on both the lumbar and lower thoracic lesions. We also thought that postmyelographic CT scans would help us identify the area to approach for laminectomy to remove the mass lesion. During myelography, we very carefully looked for neurologic responses. The patient displayed no worsening leg symptoms. Postmyelographic CT scans indicated incomplete block and spinal cord compression secondary to a large disc fragment at T11/12 (Fig. 2). Additionally, Fig. 2C suggests that there is an extradural mass. Neither MRI nor CT myelography showed severe root compression at L4/5 (Figs. 1E and 2D).

The patient underwent T11-L1 dorsal hemilaminectomy with lateral extension to the left side. Exploration of the spinal canal did not reveal extradural compression or a herniated intervertebral disc. The dura was sharply incised, revealing an intradural mass consistent with an intervertebral disc located anterolaterally to the conus. The disc material was removed, and a 5-mm anterior defect in the dura was found communicating with the inferior aspect of the disc space. The defect was closed primarily. Watertight closure of the dura mater was subsequently accomplished using polyglycolic acid and a nonwoven fabric (NEOVIL, Gunze Medical Division, Kyoto, Japan). Fibrin sealant was then applied over the suture line to reinforce the sealing effect. The operation was performed safely under intraoperative spinal cord monitoring. The patient had a good neurological recovery. She remains pain-free 2 years after the surgery.

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1. Discussion

Intradural thoracic disc herniation—migration of an intervertebral disc through the dura mater—is a relatively rare clinical entity that has been reported mainly in case reports [1–8]. Although MRI is the preferred imaging modality for diagnosing disc herniation, its imaging resolution may not be adequate to identify the intradural component of the disc herniation preoperatively [1,2,6–8].

Most (80 %) disc herniations occur during the third to fifth decades of life. Disc herniations in the thoracic spine account for only 0.15 to 4.0 % of all disc herniations. In more than 90 % of patients with thoracic disc herniation, the problem occurs between T6 and T11. The most common levels affected are T9-10, T8-9, and T10-11 [3,8]. Thoracic disc herniations most commonly present with back pain, radicular pain, sensory impairment, and/or motor changes [3]. Intradural disc herniation in the lumbar region is a well-recognized entity because more than 90% of all intradural herniations occur there [8]. Fewer than 5% occur in either the cervical or thoracic regions [8].

Several anatomic factors predispose to intradural disc herniation. The most consistently present are adhesions between the annulus fibrosus, posterior longitudinal ligament, and dura mater, which may be anatomically present or occur secondary to chronic disc protrusion [9]. In most cases, intradural herniation is a chronic process during which the intradural discs become heavily calcified [4,5]. In the thoracic region, this calcification contributes to gradual intradural erosion, thus allowing thoracic intradural discs to present with relatively minor spinal cord compression given the narrowness of the thoracic spine. Our case was different from most cases reported in the literature because the disc was soft and only mildly calcified, and the clinical course was acute. The patient had a long-standing history of back pain, but the onset of leg weakness was sudden. Minimal adhesions were found between the disc material and the dura, with no adhesions between the spinal cord and the disc material.

Contrast-enhanced MRI is the most useful imaging tool for investigating disc protrusion [5,7]. Preoperative diagnosis of intradural disc herniation in the thoracic spine is rare [1,6,7]. It should be considered, however, if extensive calcified disc material is visualized in the spinal canal. The sites of epiconus compromise detected on radiologic examination have ranged from the lower level of the T10 vertebra to the T12-L1 intervertebral disc level. They are most frequently found at the T11/12 disc level [10]. The presence of various neurologic features related to epiconus compromise should be carefully evaluated with reference to the level of termination in the spinal cord.

Almond et al [1] reported the first case of T11-12 intradural disc herniation in 2007. Our report is only the second description of epiconus syndrome with left drop foot caused by thoracic intradural disc herniation at the T11-12 level.
2. Conclusions

We described the rare case of a woman with thoracic intradural disc herniation at T11-12 who presented with left radicular pain and left drop foot. Although it is difficult to differentiate intradural and extradural lesions preoperatively using radiologic examinations, we were able to diagnose intradural disc herniation intraoperatively. The disc was removed surgically through a dural opening. The patient had good neurologic recovery and remains pain-free 2 years after surgery.

It is difficult to differentiate intradural and extradural lesions or to distinguish a spinal cord tumor from a herniated disc in the thoracolumbar lesion by either MRI or CT myelography. Preoperatively, we thought that there might be a spinal cord tumor or herniated disc. We finally suspected that it was herniated disc rather than spinal cord tumor because the clinical course had such a sudden onset. We were able to diagnose intradural disc herniation intraoperatively given the grade of suspicion.

3. Ethical standards

The ethics committee of our institution approved this study. The study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Conflict of interest

None

References


Fig. 2. Postmyelographic CT scans illustrate incomplete block and spinal cord compression secondary to a large disc fragment at T11/12. Sagittal (A), coronal (B), and axial (C and D) slices. The CT images revealed no severe root compression at L4/5 (E).

Fig. 3. Postoperative T1-weighted (A), T2-weighted (B) sagittal MRI, and T2-weighted (C) axial MRI show disappearance of disc herniation at T11/12 level.