

## Intradural Disc Herniation at the T1-T2 Level

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Intradural disc herniations comprise 0.26-0.30% of all herniated discs. Five percent are found in the thoracic, 3% in the cervical, and 92% in the lumbar region. Although intradural disc herniation may be suspected on preoperatively made CT scans, myelograms, and MRI scans, establishing the diagnosis prior to the surgery is difficult. We present a case of the patient with severe neurological deficits, caused by intradural thoracic disc herniation at T1-T2 interspace, which required surgical treatment. The symptoms were relieved immediately after surgery. This is the first description of an intradural disc herniation at that level.

**Key words:** *intervertebral disc displacement; paraparesis, spastic; spinal cord compression; thoracic vertebrae*

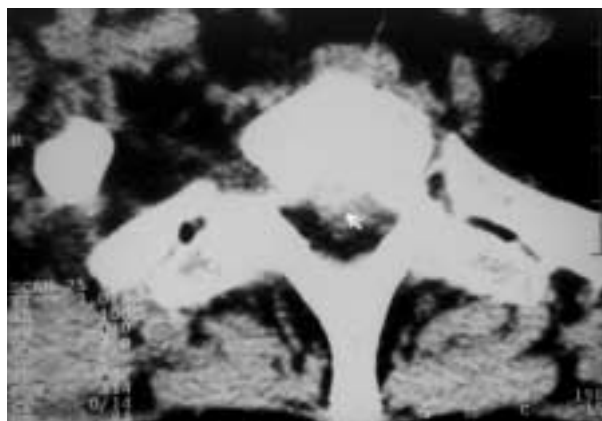
Intradural herniation of the intervertebral disc is a very rare complication of spinal degenerative processes, which comprises 0.27% of all herniated discs. In 92% of the cases, intradural disc herniations are found in the lumbar region, 5% in the thoracic, and 3% in the cervical region (1-4). Patients with intradural thoracic disc herniations present with a higher incidence of Brown-Séquard syndrome and paraplegia (5). The reviewed literature suggests that preoperative diagnosis of this lesion is uncommon. We present a patient with profound myelopathic deficits caused by intradural disc herniation in the thoracic region. This report is the first that describes a patient with an intradural disc herniation at the T1-T2 interspace of the thoracic spinal canal.

### Case Report

In 1992, a 64-year-old alert, fully oriented woman, with history of a right nephrectomy done in 1988 due to an adenocarcinoma, was admitted to our neurosurgery department for evaluation of weakness of both legs and urinary incontinence that had lasted for a month. She was pain-free and denied any trauma to her cervical or thoracic vertebra. Physical examination revealed marked spasticity of both legs, with muscle strength graded 3/5, requiring her to use a walker. She exhibited bilateral Babinski responses, hyperreflexia (3+) at the knees and ankles, and bilateral loss of light touch and pinprick below the T3 level. Proprioception, temperature, and vibration sensations were nor-

mal. Non-contrast computed tomography (CT) scans showed a large, midline, partially left-sided lesion, opposite the T1-T2 interspace and extending into the spinal canal for approximately 6 mm (Fig. 1). Contrast-enhanced CT (myelo-CT) scans demonstrated a midline lesion at the T1-T2 interspace that produced a moderately severe obstruction to the flow of the contrast (Fig. 2). These findings were thought to represent a potential tumor mass in the spinal canal that compressed the thecal sac. Magnetic resonance imaging (MRI) showed an instability at the T1-T2 level and a massive hypointense lesion compressing the spinal cord opposite the T1-T2 interspace (Fig. 3). The T1-T2 left-sided hemilaminectomy was performed. No signs of extradural disc or tumor were identified, but a distended, swollen thecal sac was found. We suspected an intradural herniation. Using the operating microscope, we made a longitudinal dural incision. Upon opening the thecal sac, a disc fragment of approximately 3×2×1 cm was visualized. It was displaced and compressed the ventral cord to the right side.

To gain better exposure, extensive removal of the left T1-T2 facet was performed. Thin arachnoid capsule over the disc mass was incised and the fragment was extirpated in one piece without cord retraction. Frozen section was consistent with disc material. The dural incision was closed with dural sutures in a watertight fashion. There was no leak of cerebrospinal fluid.



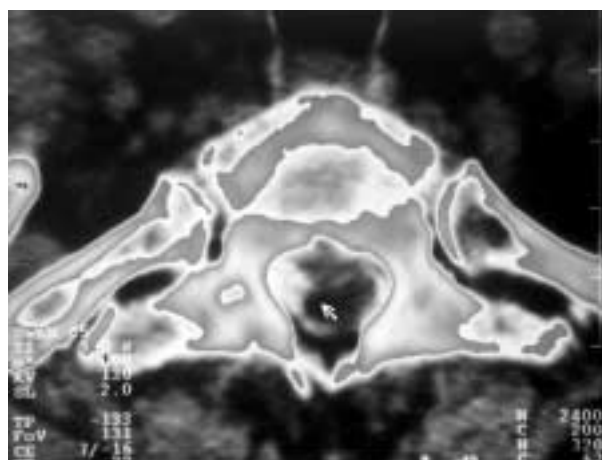
**Figure 1.** Non-contrast CT scan of T1-T2 level demonstrated a large midline calcified lesion that extended from the floor to the center of thoracic vertebral canal (arrow).

Patient tolerated the surgical procedure well and experienced an immediate improvement in sensory and motor function. Prior to discharge from the hospital, she could walk with the aid of a cane and no longer required a Foley urinary catheter. She was discharged ten days after surgery and continued with physiotherapy. Subsequent recovery was uneventful.

When the patient was seen at the follow-up visit 1.5 month postoperatively, she was walking without assistance, but still showed some spasticity in lower extremities. Sphincter function was normal. Six years after the surgery, she continues to function well.

**Discussion**

Approximately 35 cases of intradural thoracic disc herniations have been reported in the literature (6). Our case report presents a patient with an intradural disc herniation at T1-T2 level, ie, in the upper third of the thoracic spine, which is the first finding of this lesion on that level. Reviewing the literature, we have selected the cases of intradural disc herniation that had lesions in the



**Figure 2.** Contrast-enhanced CT scan of T1-T2 level demonstrated a midline intradural lesion (arrow). The value of myelo-CT scan was limited because of paucity of contrast at the level of the block.

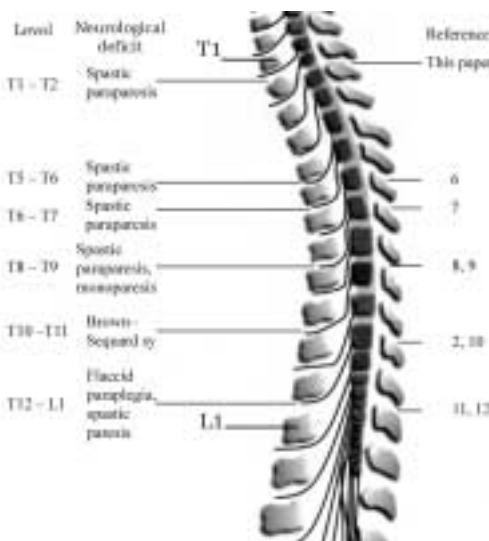


**Figure 3.** MRI sagittal T1-weighted scan demonstrated a massive hypointense lesion compressing the spinal cord opposite the T1-T2 interspace.

middle and lower third of the thoracic spine (Fig. 4). The most affected region is the middle third of the thoracic spine, and the most prominent neurological deficit is spastic paraparesis, which was present in four patients, including ours (6-8). Intradural disc herniations in the thoracic spinal canal comprise 5% of all intradural herniations (1,2,4). The pathogenesis of intradural disc herniation, a rare and unusual lesion, is still uncertain. Ventral dura, which is adherent to the posterior longitudinal ligament, may become the path of relatively less resistance to the herniating disc (13,14). Nevertheless, the incidence of significant adhesions of the dura to the posterior longitudinal ligament and annulus fibrosus in thoracic region is low, which explains why these herniations are rare (15).

The preoperative diagnosis of intradural disc herniation is uncommon (10,16). Originally, the diagnosis of the thoracic disc herniation relied on the plain x-ray visualization of calcification opposite of an interspace or on the deformity of the thecal sac visualized on a Pantopaque myelogram (17).

Varying combinations of MRI, non-contrast CT scans, myelogram, and myelo-CT scans may increase the possibility of establishing a correct diagnosis (2). Lidov



**Figure 4.** Nine cases of intradural thoracic disc herniation.

et al (18) recommend MRI as the most reliable modality for detecting this uncommon complication of disc herniation.

In our patient, the findings on non-contrast CT scans and myelo-CT scans were consistent with a tumor mass compressing the spinal cord. MRI findings were suspicious of a tumor lesion or a thoracic extradural disc herniation at the T1-T2 level. Neither MRI nor myelo-CT scans definitely revealed an intradural disc herniation. The correct diagnosis was made intraoperatively, proving that surgical treatment of intradural disc herniation is an absolute requirement because of the severity of symptoms and neurological deficits (19).

We opted for the posterior approach because of preoperatively suspected tumor or extradural disc. Although laminectomy is no longer an accepted method for approaching a thoracic disc herniation, in our case it offered an adequate exposure and allowed complete extirpation of the intradural disc fragment. The other safer and more convenient surgical approaches include the costotransversectomy, transthoracic approach, and extracavitary costotransversectomy with a hemilaminotomy (6,20,21).

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