

## Thoracic Intraspinal Synovial Cyst Causing Myelopathy: A Case Report<sup>1</sup>

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Intraspinal synovial cysts are commonly found in the lumbar spine and occur less commonly in the cervical spine. Occurrence of a cyst in the thoracic spine causing myelopathy is extremely rare. We report here the radiological findings of a case of a thoracic intraspinal synovial cyst that caused myelopathy at the T2-3 level with an accompanying review of the clinical literature.

**Index words :** Synovial cyst  
Spinal cord diseases  
Thoracic vertebra

Intraspinal synovial cysts are found within the lumbar spine and less commonly found in the cervical spine (1). An occurrence of a cyst in the thoracic spine causing myelopathy is extremely rare (2) and to the best of our knowledge, 25 cases of thoracic synovial cyst have been reported in the English language clinical literature and of these cases, only seven cases have been reported where a synovial cyst was combined with myelopathy. These intraspinal extradural cysts arise from the facet capsules of degenerative facet joints and are designated as synovial (1, 2), juxtafacet (3), ganglion (4), or ligamentum flavum cysts (5). We report the radiological findings of a case of thoracic intraspinal synovial cyst that caused myelopathy at the T2-3 level.

### Case Report

A previously healthy 48-year-old woman was admit-

ted to our hospital with a 5-month history of bilateral lower extremity pain, numbness, and weakness. The patient had no history of trauma. A CT scan (Fig. 1A) showed a mass lesion in the spinal canal adjacent to the left T2-3 facet with gas content. An MRI examination (Fig. 1B - E) enabled a correct preoperative diagnosis of an oval mass in the spinal central canal, which compressed the posterior surface of the upper thoracic spinal cord at the T2-3 level and was combined with a high signal change of the spinal cord at the same level as seen on a T2-weighted image. The signal intensity was isointense to the ligamentum flavum as seen on a T1-weighted image (Fig. 1B) and The signal intensity was high with a low-signal intensity rim as seen on a T2-weighted image (Fig. 1C, D). A contrast-enhanced axial T1-weighted image (Fig. 1E) showed peripheral enhancement of the cyst. The patient underwent a left laminectomy at the T2-3 level, and a nodular encapsulated fibrotic mass that compressed the dural sac forward was found. The mass adhered to the dura and was completely extirpated under microscopic magnification. The capsule of the mass was soft and was filled with a clear liquid material.

Examination of the histological sections of the mass demonstrated the presence of a cyst focally lined by a

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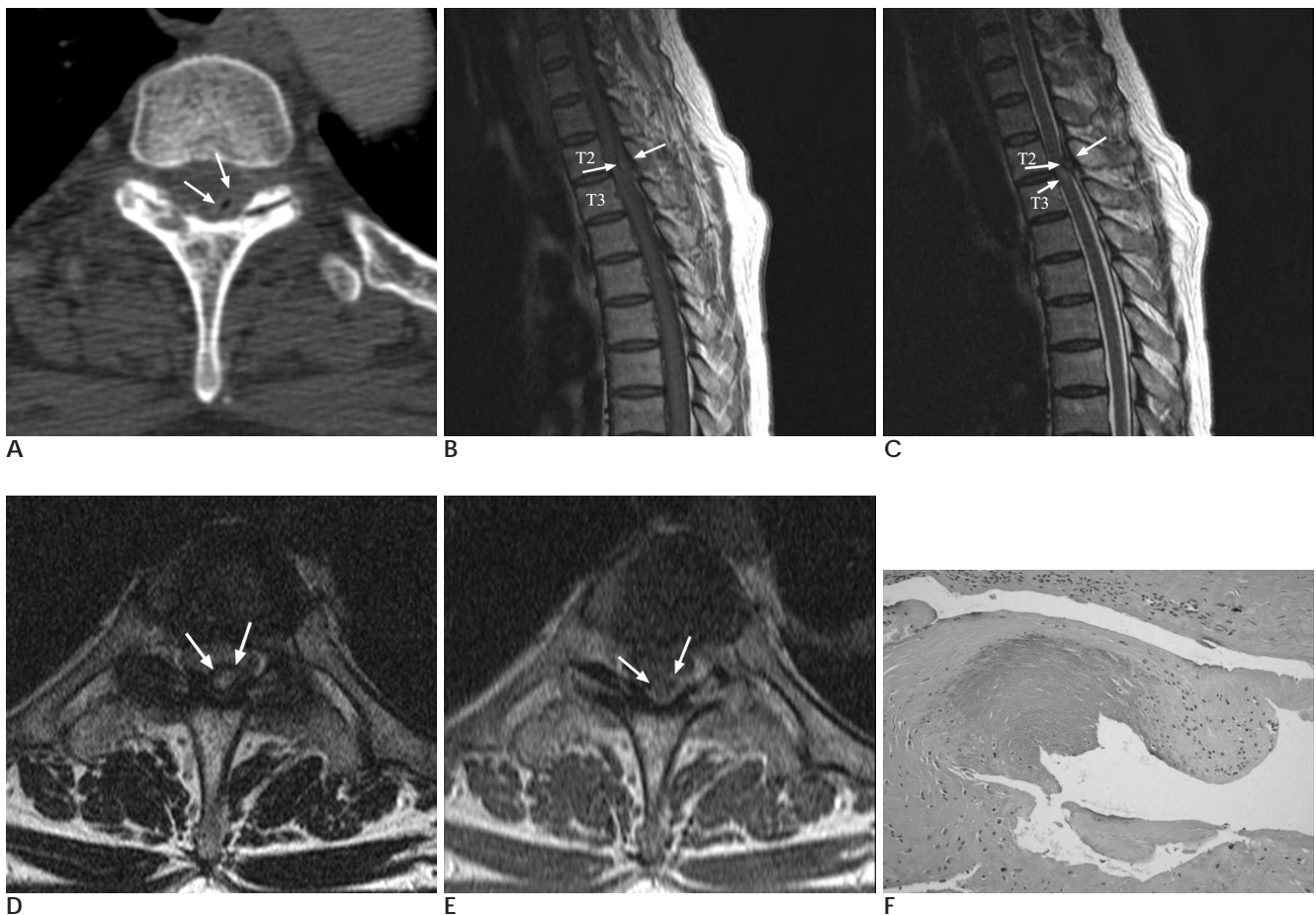
single layer of synovial cells and a degenerative change of stroma (Fig. 1F).

The postoperative course was uneventful with rapid and complete relief of the pain.

### Discussion

Thoracic synovial cysts are much rarer than lumbar and cervical spine cysts (1, 2). To the best of our knowledge, 25 cases of thoracic synovial cysts have been reported in the English language clinical literature. Of these 25 reported cases, only seven cases were of a cyst combined with myelopathy and these cases were mostly found within the lower thoracic spine. The rarity of

these cases may be explained by the decreased mobility of the thoracic spinal canal (6). The pathophysiology of these lesions may involve facet degeneration and areas of focal weakness in the joint capsule caused by repetitive motion due to instability followed by herniation of the synovium and formation of the synovial cyst (7). Myxoid degeneration, increased production of hyaluronic acid, and non-specific proliferation of mesenchymal cells have also been proposed as mechanisms of cyst development and enlargement (8). Most investigators distinguish synovial cysts, which are lined with synovial cells, from ganglion cysts, which do not contain synovial cells. However, several investigators have chosen not to make this distinction (9).



**Fig. 1.** A 48-year-old female with bilateral lower extremity pain, numbness, and weakness.

**A.** A transaxial CT scan demonstrates a mass lesion (arrows) in the spinal canal adjacent to the left T2-3 degenerative facet with gas content.

**B - D.** Sagittal T1- (B), T2-(C) and axial T2 (D)-weighted MR images show an oval mass (long arrows) in the spinal central canal. The mass compresses the posterior surface of the upper thoracic spinal cord and the mass was combined with a high signal change of the spinal cord (short arrow) at the same level as seen on a T2-weighted image. The mass demonstrates high signal intensity along with a peripheral rim of low signal intensity on a T2-weighted image.

**E.** A contrast-enhanced axial T1-weighted MR image shows peripheral enhancement of the cyst (arrows).

**F.** A photomicrograph (hematoxylin and eosin staining,  $\times 100$ ) shows that a single layer of synovial cells and a degenerative change of stroma focally lined the cyst.

The clearest diagnosis of synovial cysts is provided by the use of MRI. Signal intensity of the cysts on MR images may be variable because of the complex composition of the lesions as the cysts may contain hemorrhagic products, calcium, gas, or high-protein fluid (9). Cohen et al. (6) described the pattern of MRI findings of thoracic synovial cysts in nine patients according to their signal intensity. The most common MR signal pattern observed in 33% of the cysts was an extradural lesion that was isointense to the ligamentum flavum as seen on T1-weighted images and as a high signal on T2-weighted images. The classic low signal seen on a T1-weighted image and a high signal seen on a T2-weighted image was present in only three of the cysts (25%). Peripheral enhancement of the cyst wall was common (78%) and was presumed to result from vascularity or surrounding inflammation. In the present case, the cyst was isointense as seen on a T1-weighted image and a high signal was seen on a T2-weighted image that showed peripheral enhancement of the cystic wall.

Treatment of synovial cysts has varied from the use of conservative management to surgery. The use of CT-guided aspiration with or without corticosteroid injection has proved successful in the temporary treatment of symptomatic pain, but only surgical excision has been proved to be associated with a minimal rate of recurrence (2).

The differential diagnosis of an extradural mass on an MR image includes a neoplasm, a herniated disc fragment and an abscess. The presence of a posterolateral cyst with a high signal as seen on a T2-weighted image

that is adjacent to a degenerated facet, with a rim that is seen as a low signal on a T2-weighted image but is enhanced with the administration of contrast material may lead to a correct imaging diagnosis of a benign synovial cyst.

In conclusion, a thoracic synovial cyst should be considered in the case of an intraspinal extradural lesion with myelopathy.

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