

A Crescent-Shaped Juxtafacet Cyst as a Rare Cause of High Thoracic Myelopathy with Partial Brown-Séquard's Syndrome

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“Juxtafacet cyst” (JFC), the term proposed by Kao et al. to include both intraspinal synovial cysts and ganglion cysts, often indistinguishable from each other even histopathologically^{1,2)}, usually accompanies degenerative changes in the neighboring facet joint with segmental instability³⁾. This cystic lesion typically occurs in the lumbar spines, most commonly at L4-L5, much less frequently in the cervical spines. The JFC rarely develops in the thoracic spines, if at all, commonly affecting more caudally to the T7 level as shown previously, but this is not always the case⁴⁻⁷⁾. Just recently (2017), there was a second single case report of myelopathy associated with a thoracic synovial cyst located more rostrally to the T7 level⁸⁾. The current study documents a barely reported case of JFC, which developed at the T2-T3 intervertebral level with a crescent-shaped appearance rather than the typically round or ovoid-shaped mass with partial Brown-Séquard's syndrome.

A 65-year-old man presented with a 1-month history of numbness in both legs and increasing difficulty in walking. Neurological evaluation revealed partial Brown-Séquard's syndrome with spastic paraparesis predominantly affecting the right lower limb and loss of pain sensation that predominated in the contralateral trunk and lower limb. Consistent with the right-sided Brown-Séquard's syndrome not involving the upper limbs, MRI of the thoracic spine disclosed an epidural cystic mass with a sharply marginated crescent shape, located posterolaterally in the canal, close to the degenerated right T2-T3 facet joint with joint effusion, compressing the spinal cord. The cyst had a roughly CSF-equivalent signal intensity on MRIs with T1-low and T2-high signals surrounded by a T2-low signal intensity rim suggestive of a fibrous capsule not clearly separated from

the ligamentum flavum (Fig. 1). The CT scans demonstrated mild spondylolisthesis of T2 on T3, severely degenerated facets bilaterally at C7-T1 through T2-T3, and spontaneous fusion at C7-T1 and T1-T2 facet joints (Fig. 2). In fact, intraoperative manipulation of the spinous processes demonstrated movements through the facet joints at T2-T3, but not at T1-T2.

The surgical procedure consisted of laminectomy and medial facetectomies at T2-T3 level on both sides, followed by microdissection of the cyst, posterior spinal fusion with pedicle screw instrumentation, and local bone graft. Our findings at surgery confirmed the diagnosis of JFC, i.e., the cyst had a connection to the right T2-T3 facet joint space, although MRI usually fails to visualize such communications. Spinal cord monitoring with motor-evoked potential studies helped safely dissect off the firmly adhering cyst wall from the dura (Fig. 3). Histopathological examination of the cyst wall demonstrated neither a synovial lining nor a myxomatous change, which is often the case with JFCs, and the frequent sparsity of a synovial lining in JFCs remains a matter of debate⁹⁾. Postoperatively, the patient showed a rapid, progressive improvement of myelopathy and eventually a nearly complete return of function, reflecting the postoperative MRI findings, which confirmed complete cyst removal with adequate spinal cord decompression (Fig. 4).

The JFCs in the thoracic spines have level-dependent predilections, probably because the first seven pairs of ribs, unlike those below, are directly connected to the sternum *via* the costal cartilage, thereby providing more stability with less degenerative cascade for the corresponding thoracic segments than for the lower thoracic spines. However, spine surgeons must bear in mind that it may possibly be a cause

of high thoracic myelopathy, particularly when associated with degenerative spondylolisthesis. This age-related condition might be much more frequently encountered than previously thought with population aging. The unique morphology of crescent-shaped appearance may depend on its vertebral level location and/or reflect one of the various stages of

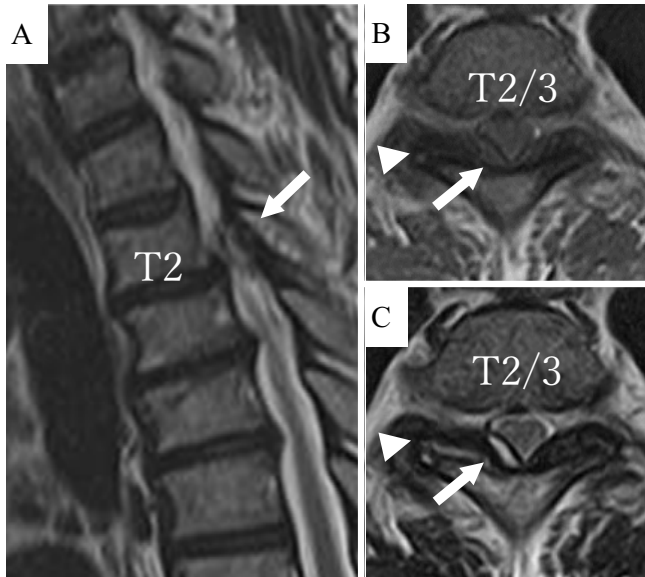


Figure 1. Preoperative MRIs.

The right parasagittal T2-weighted (A), the axial T1-weighted (B), and the axial T2-weighted (C) MRIs show a well-defined, crescent-shaped, cystic mass lesion in the epidural space, located right posterolaterally in the canal, adjacent to the right T2-T3 facet joint (i.e., juxtafacet cyst [JFC], arrows). Note the joint effusion in the right T2-T3 facet joint space shown by the axial MRIs (arrow heads).

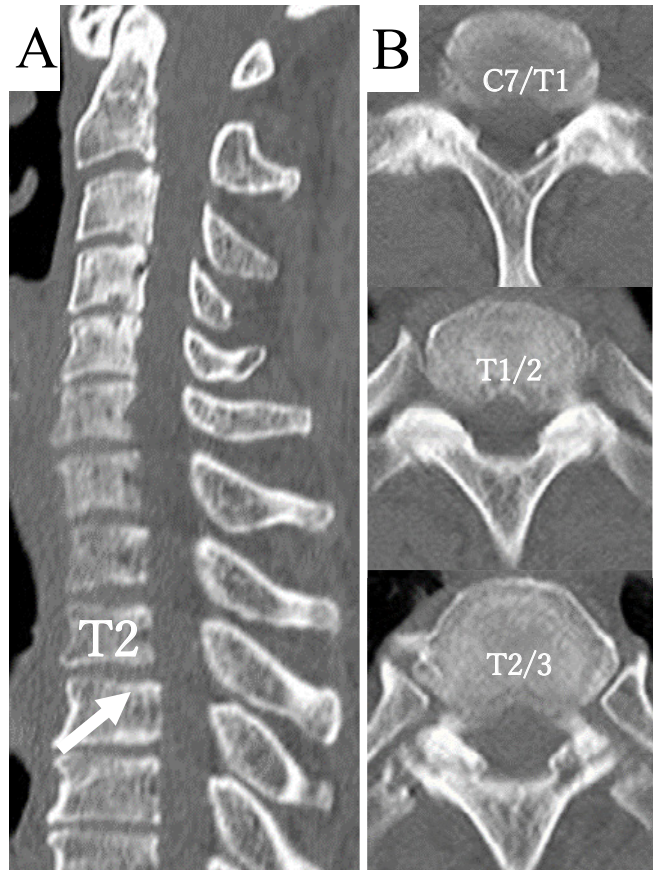


Figure 2. Preoperative CT scans.

The midsagittal reformatted CT image (A) shows a reduced cervical lordosis and mild spondylolisthesis of T2 on T3 (arrow). The axial CT images (B) indicate the severely degenerated facet joints bilaterally at C7-T1 through T2-T3 with spontaneous facet fusion at C7-T1 and T1-T2.

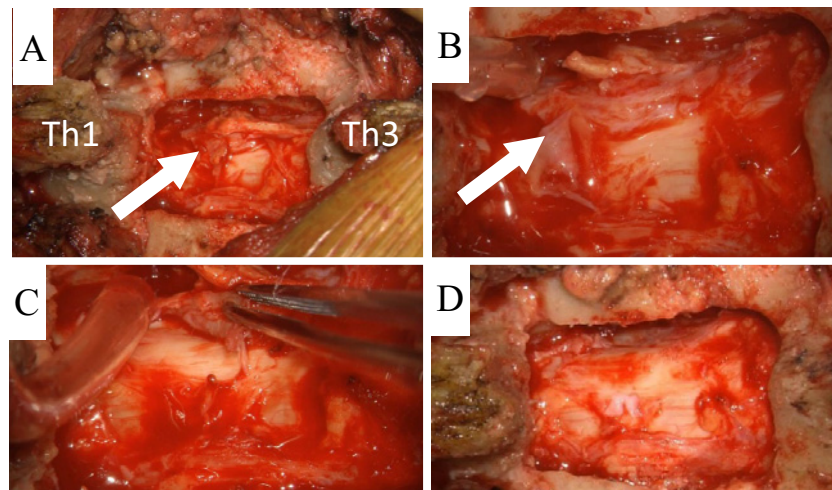


Figure 3. Intraoperative microscopic views.

Operative photographs following laminectomy with medial facetectomies at T2-T3 level on both sides and the removal of the ligamentum flavum, showing the JFC adjacent to the right T2-T3 facet joint (arrows) under a low (A) and a high magnification (B) of the microscope. Firm adhesion between the cyst wall and the dura (C) was dissected off with mostly a blunt microdissection resulting in a complete cyst removal (D).

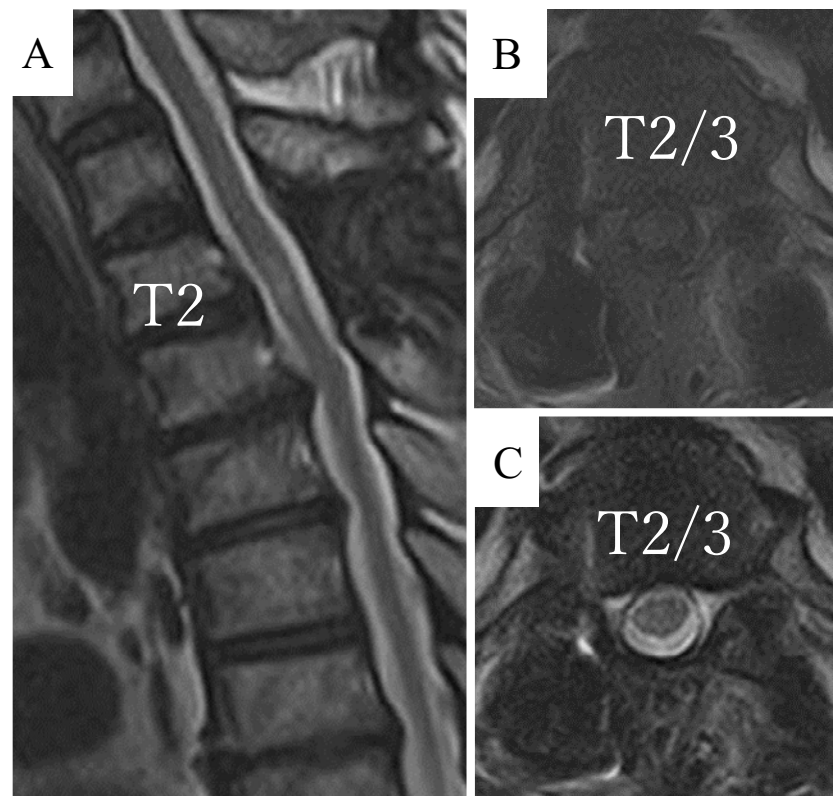


Figure 4. Postoperative MRIs at 2 months. Midsagittal T2-weighted (A), axial T1-weighted (B), and axial T2-weighted (C) MRIs, showing complete cyst removal with adequate decompression of the spinal cord.

the cyst formation¹⁰, but identifying the determinants shaping the JFC requires further evidence.

Conflicts of Interest: The authors declare that there are no relevant conflicts of interest.

Author Contributions: Kazunobu Kida wrote and prepared the manuscripts, and all authors participated in the study design. All authors have read, reviewed, and approved the article.

Informed Consent: Written informed consent was obtained by the patient in this study.

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