

Spinal Neurosurgery Report

Complete removal of ossification of the posterior longitudinal ligament in the mid-thoracic spine

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Case report

A 50-year old Korean woman was referred to us because of a 4-month history of progressive gait disturbance and hypesthesia of the lower extremities, and she could not stand by herself. A neurological examination demonstrated hyperreflexia and motor weakness of the lower extremities. Magnetic Resonance Imaging (MRI) of the thoracic spine

showed noticeable compression of the spinal cord from lower part of T4 to upper part of T7 and an isolated beak-type anterior lesion at T 7/8 (Fig. 1a). Computed tomography (CT) (Fig. 1b) revealed ossification of the posterior longitudinal ligament (OPLL).

The patient was operated on through a transthoracic anterolateral approach. A left-sided thoracotomy was performed through the T6/7

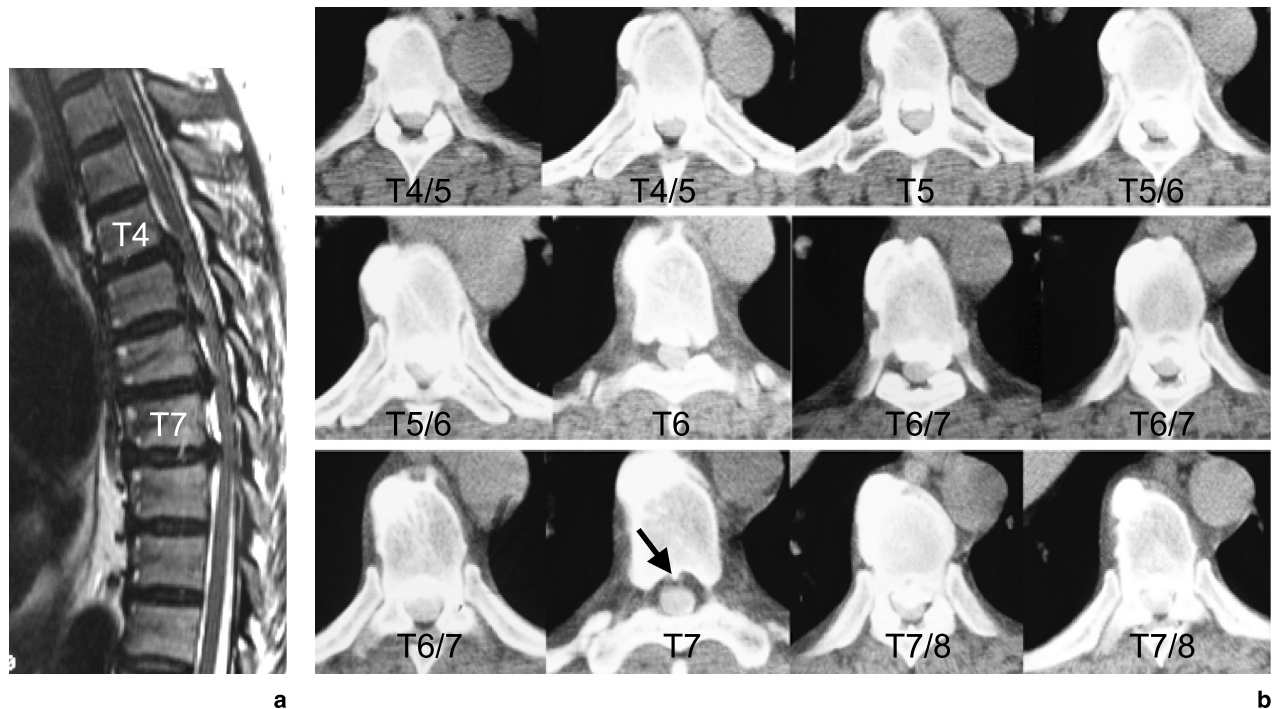
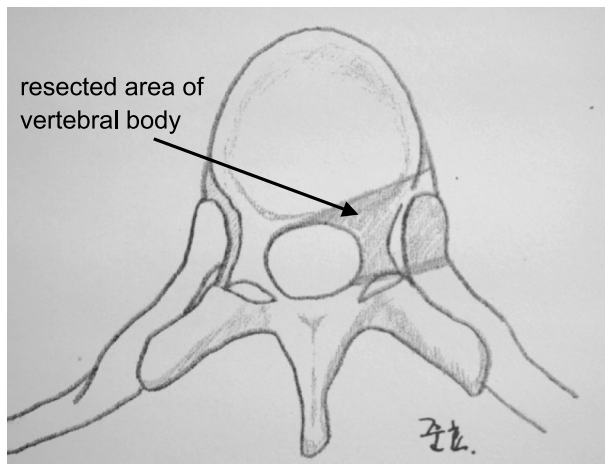
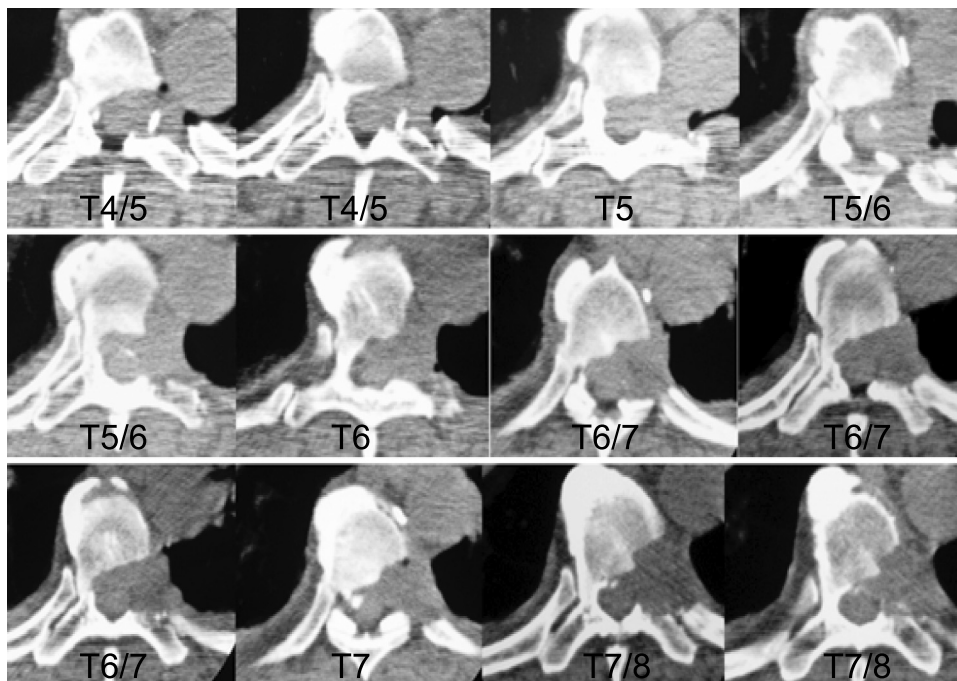


Fig. 1. (a) Sagittal section of a T2-weighted image revealing marked anterior compression of the spinal cord caused by a continuous-lesion from the lower part of T4 vertebral body to the upper part of T7 vertebral body and an isolated beak-type lesion at T 7/8. (b) Serial axial CT scans from T4 to T8 demonstrated thick OPLL at T4/5, T5, T5/6, T6, T6/7, and T7/8. Interestingly, the posterior longitudinal ligament at the level of T7 does not appear ossified (arrow). (c) Sketch created by the surgeon (JYC), illustrating the details of the surgical anatomy. (d) Postoperative serial axial CT scans from T4 to T8 CT scans demonstrate adequate decompression of the spinal cord



c



d

Fig. 1 (continued)

intercostal space and resection of the sixth rib by a thoracic surgeon. The parietal pleura overlying the vertebral bodies was opened off the midline and sharp dissection was carried out to avoid injuring the segmental vessels and sympathetic chains. The posterolateral part of the involved vertebral bodies and the rib head were partially drilled out under the operating microscope. Then, the OPLL was identified and we meticulously drilled out the OPLL using diamond burrs from T4/5 down to T7/8. Ossification of the dura was found and also resected. After resection of the dural ossification, the cord was sufficiently decompressed. During meticulous resection of the dural ossification, cerebrospinal fluid leaked at the level of T5/6 and the dura was repaired with fatty tissue and commercially-available BioGlue (CryoLife, Inc., Kennesaw, GA). Postoperatively, the patient gradually gained motor strength of the lower extremities. The CT scans demonstrated sufficient decompression of the spinal cord (Fig. 1d). Five months after operation, she can take a walk using a cane.

Keywords: Thoracic OPLL; transthoracic anterolateral approach; complete resection.

Discussion

OPLL is a relatively common cause of myelopathy in Korea and Japan since its first description of cervical OPLL causing myelopathy by Tsukimoto in 1960 [5].

Thoracic OPLL is indeed rare. Its management is technically demanding and even more difficult than for OPLL in the cervical or lumbar region because it is anatomically hard to reach the anterior site of the lesion.

Thoracic OPLL may be removed through an endoscopic approach, which has a high potential to reducing unnecessary trauma on soft tissue as well as on structures intimately related to stability. However, the use of longer tools, as well as the new ways of visualization, perception and spatial orientation, have to be learned in the laboratory before starting on clinical application [3].

Our case is of interest in that a surgically challenging thoracic OPLL is completely resected without any complications following minimal body removal through a transthoracic anterolateral approach, which provided an extensive exposure of the anterior aspect of the full length of the involved vertebral bodies [4]. We could repair the cerebrospinal fluid leak with fatty tissue and fibrin glue as Ido *et al.* reported in the literature. They performed direct closure by fixing substitute dura mater with fibrin adhesive sealant or cyano-acrylate adhesive [2]. We do not think fusion is necessary, because the thoracic spine is anatomically stabilized by the presence of the rib cage [1]. The success in obtaining the neurological improvement in our case supports the rationale of our method. Here we report what is believed to be a surgically challenging case of thoracic OPLL.

Acknowledgement

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Comments

The authors describe the unusual occurrence in a 50-year old woman of ossification of the posterior longitudinal ligament (OPLL) over several segments in the thoracic spine. A good surgical outcome is described for a potentially technically challenging problem. It is noteworthy that OPLL in the cervical spine is typically managed via posterior approaches (either laminectomy, laminoplasty or laminectomy and fusion) where as in this case an anterior approach is advocated, quite appropriately, for thoracic disease. The management of the potentially devastating complication of cerebrospinal fluid leak is also discussed with ways to avoid this problem. Interestingly fusion was not required.

This report is useful for surgeons managing patients with OPLL as well multiple contiguous thoracic disc protrusions and the authors are to be congratulated on their good outcome.

Lali Sekhon
Sydney, Australia

The purpose of this paper is to report a rare case of surgical management of OPLL involving the thoracic spine.

The authors present this rare case in a concise manner, provide the necessary information as well as the relevant pictures. A drawing nicely depicts the amount of surgical drilling. Probably this kind of surgery may be done endoscopically. Although no new information is provided, this manuscript adds a rare case to the limited body of literature and is worth being published in “Acta Neurochirurgica”.

W. Deinsberger
Giessen

Nice illustration of an elegant transthoracic approach and complete removal of OPPL from T4 to T8. The strong point is drilling the ossification using microtechnique without manipulating the chronically compressed anterior thoracic spinal cord. The limited bony resection does not destabilise the mid-thoracic spine maintained by the rib cage.

Guy Matgé
Luxembourg

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