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Case report

Anterior spinal cord herniation after multilevel anterior cervical corpectomy: A case report

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ABSTRACT

Many complications related to the resection of an ossified posterior longitudinal ligament via the anterior approach have been reported. Postoperative neurological deterioration is one such complication that may appear due to massive anterior spinal cord herniation related to a dural defect following resection of the ossified posterior longitudinal ligament. Specifically, spinal cord herniations have been reported to be associated with posterior approaches, and a large number of theories regarding this association have been offered by various authors. However, anterior spinal cord herniation is extremely rare, and its pathophysiology has not yet been explained. In this case report, we report a male patient who experienced anterior spinal cord herniation following anterior surgery. Spinal cord herniation may develop following the removal of the anterior cervical corpectomy. Therefore, surgeons should be aware of this condition when planning treatments for cervical spondylotic myelopathy via the anterior approach.

1. Introduction

Various complications associated with the treatment of cervical spondylotic myelopathy due to ossified posterior longitudinal ligament (OPLLs) have been reported [1–3]. The most common complications are inadequate decompression, haemorrhage, postoperative neurological deterioration and cerebrospinal fluid (CSF) leakage [3–5].

Spinal cord herniation (SCH) is frequently idiopathic or spontaneous. Additionally, trauma and surgery may be factors that are related to the development of SCH [6,7]. However, SCH following cervical anterior multilevel corpectomy for the treatment of cervical spondylotic myelopathy due to OPLL has rarely been reported [4], and the cause of this pathophysiology have not yet been explained. Therefore, we present a case who developed anterior SCH following two-level corpectomy and OPLL resection and explain the pathophysiology of

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Abbreviations: OPLL, ossified posterior longitudinal ligament; CSF, cerebrospinal fluid; SCH, spinal cord herniation; MR, Imagnetic resonance imaging; COPD, chronic obstructive pulmonary disease.

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the formation of the SCH via a new hypothesis in the present report.

2. Case report

A 60-year-old male patient presented with a three-year history of quadriparesis and neck pain. A neurological examination revealed that his muscle strengths were 4/5 in the bilateral upper extremities and 3/5 in the lower extremities. Deep sensory loss was present in the bilateral upper and lower extremities, and the deep tendon reflexes were hyperactive in the lower extremities but hypoactive in the upper extremities. Pathological reflexes were identified in the bilateral lower extremities. Magnetic resonance imaging (MRI) and computed tomography revealed an OPLL that caused cord compression between the C3 and C6 disc levels. The lesion was in the midline of the vertebral body (Fig. 1). The most severe compression occurred at the C5–6 levels (Fig. 2A and B). We decided on anterior spinal surgery, but the patient had chronic obstructive pulmonary disease (COPD) and was therefore referred to a chest disease doctor prior to surgery. Medical treatment was administered for two weeks prior to the surgery. Approval forms were collected from the patient before the surgery. During the operation, C4 and C5 vertebral body resections were performed with Kerrison punch and a high-speed drill. Subsequently, the central portion of the OPLL was removed with a diamond drill, but a tiny shell of the cortical bone was left in place. While we were removing this central portion of the OPLL using a micro-hook and Kerrison punch, the dura was torn, and the arachnoid membrane and neural tissue were directly exposed. Direct repair of the dura was not possible. Therefore, the dura was closed using a synthetic dural graft and tissue adhesive, and an iliac bone autograft was subsequently inserted into the corpectomy side. A cervical plaque was inserted and screwed. The patient's neurological status was examined on the first postoperative day, and no neck pain was noted, and his upper and lower extremities were relaxed. However, he had a persistent cough during the postoperative period. CSF collection was performed under the incision field on the second postoperative day. To achieve this collection, an external lumbar drainage catheter was placed at the lower lumbar level. The lumbar catheter was withdrawn on the fourth postoperative day because no CSF was collected under the incision site. The patient's neurological examination results worsened on the sixth postoperative day. The

Fig. 1 – Preoperative cervical axial CT showing the location of the OPLL mass on the midline of the cervical spine.

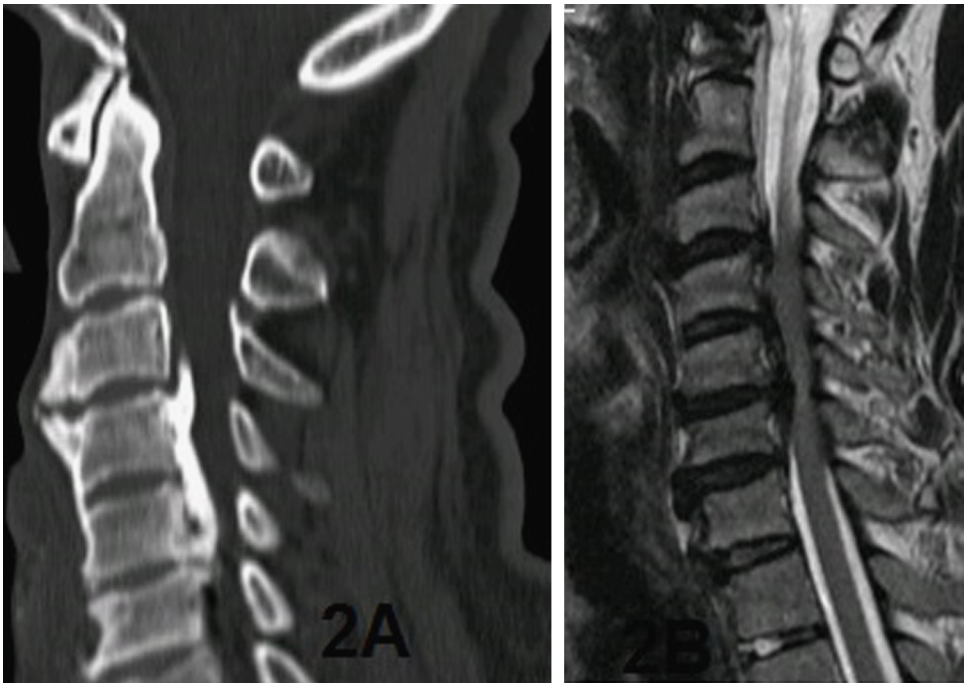

Fig. 2 – The maximal compression area occurred at the C5–C6 levels of the cervical spine as indicated by preoperative sagittal CT (A) and sagittal T2-weighted MRI images (B).