

Complications corner: Anterior thoracic disc surgery with dural tear/CSF fistula and low-pressure pleural drain led to severe intracranial hypotension

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Abstract

Background: Thoracic disc surgery can lead to a life-threatening complication: intracranial hypotension due to a subarachnoid-pleural fistula.

Case Description: We report a 63-year-old male with paraparesis due to multiple herniated thoracic discs, with compressive myelopathy. The patient required a circumferential procedure including a laminectomy/fusion followed by an anterior thoracic decompression to address both diffuse idiopathic skeletal hyperostosis (DISH) anteriorly and posterior stenosis. The postoperative course was complicated by severe intracranial hypotension attributed to the erroneous placement of a low-pressure drain placed in the pleural cavity instead of a lumbar drain; this resulted in subdural hematoma's necessitating subsequent surgery.

Conclusion: Severe neurological deterioration occurring after thoracic decompressive surgery may rarely be attributed to intracranial hypotension due to a subarachnoid-pleural fistula. Patients should be treated with external lumbar drainage of cerebrospinal fluid for 3–5 days rather than a low-pressure pleural drain to avoid the onset of intracranial hypotension leading to symptomatic subdural hematomas.

Key Words: Cerebrospinal fluid leak, herniated disc, intracranial hypotension, subarachnoid-pleural fistula, spine, surgery

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INTRODUCTION

History and examination

A 63-year-old obese male, presented with a progressive paraparesis. Magnetic resonance imaging (MRI) and computed tomography (CT) studies documented severe T5-T9 diffuse idiopathic skeletal hyperostosis (DISH) resulting in marked circumferential cord compression

attributed to multiple anterior ossified disc herniations and posterior ossification of the ligamentum flavum (OYL)/facet arthrosis. The most marked cord compression was seen at the T6-T7 and T8-T9 levels [Figures 1 and 2].

Surgical procedure

A decompressive laminectomy T5-T9/pedicle instrumented fusion revealed severe OYL. Dural adhesions

led to a cerebrospinal fluid (CSF) fistula at the T6-T7 level primarily closed with Prolene, and covered with Tachosil and Tissucol (e.g. both sealants). The patient then immediately underwent an additional anterior transthoracic right-sided T6-T7 discectomy. After opening the ossified anterior longitudinal ligament (OALL), the large calcified T6-T7 disc was mobilized and removed; at this point, the posterior positioned fibrin patch was visible, and was supplemented with an anterior patch of Tachosil. As the Valsalva maneuver revealed no residual CSF leak, an intrapleural low-pressure drain (e.g. to promote lung reexpansion) but no external lumbar CSF drain was placed.

Postoperative course

Postoperatively, he became paraplegic. The postoperative MR showed no hemorrhage. The intrapleural drain was removed on postoperative day 2. As he continued

to experience orthostatic headache, bed rest was originally prescribed; however, 3 days later he was found unresponsive. When the brain CT showed bilateral subdural hematomas, bilateral burr holes were placed and the clot was evacuated [Figure 3]. Although he regained consciousness, one day later he again became comatose. Brain MR showed recurrent bilateral subdural hematomas, an obliterated cerebral aqueduct, a swollen brain stem, and herniation of the cerebellar tonsils through the foramen magnum [Figure 4]. He emergently underwent reevacuation of bilateral subdural hematomas and bony decompression of the foramen magnum with a cerebellar tonsillectomy. He regained full consciousness.

When chest X-rays showed a large right-sided pleural fistula attributed to a persistent CSF leak, repeated anterior exploration (posterior had failed to show a fistula) allowed the dural/pleural fistula to be closed

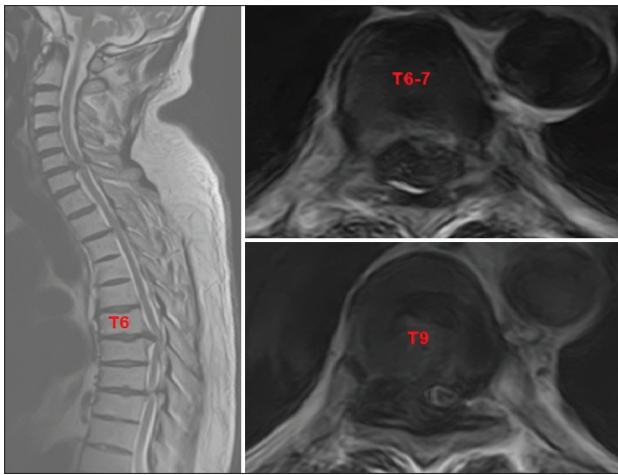


Figure 1: Sagittal T2 MR imaging of the spinal column: herniated discs at T6-7 and T8-9 with dural compression and myelopathy

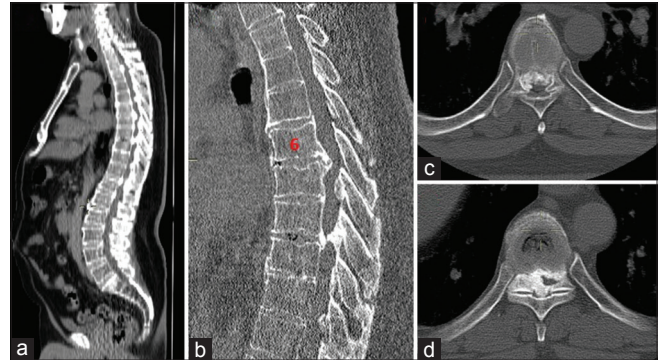


Figure 2: a and b: Sagittal (detailed) CT image demonstrating calcified herniated discs and diffuse ossification over larger parts of the spinal column. c and d: detailed axial CT image at the T6-7 and T8-9 levels showing ossification of the posterior longitudinal ligament, ligamentum flavum and facet joint with subsequent severe spinal stenosis



Figure 3: CT brain image showing bilateral subdural hygroma with effacement of sulci

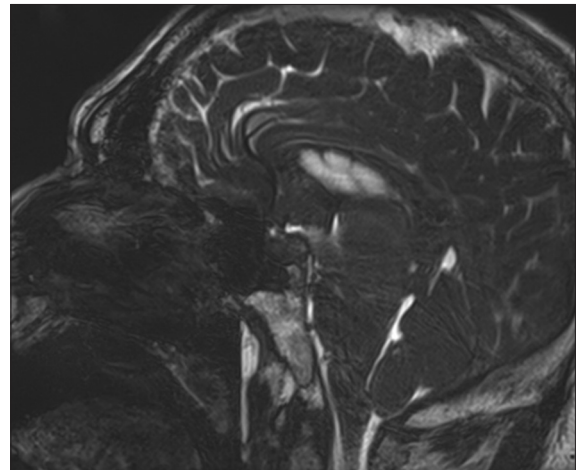


Figure 4: Sagittal T2 MR image showing diffuse edema of the brain stem and an obliterated 4th ventricle in the posterior fossa

and covered by Tachosil [Figure 5]. Postoperatively, he remained stable and was transferred for rehabilitation.

CONCLUSION

Intrapleural low-pressure drains placed following transthoracic procedures to facilitate lung reexpansion may potentiate subarachnoid-pleural fistulas that may result in life-threatening intracranial hypotension.

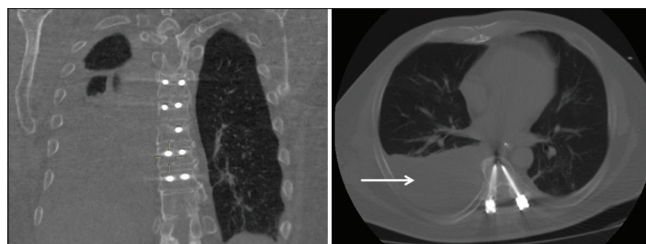


Figure 5: CT images of the thorax showing right sided pleural effusion (arrow)