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Ossification of the Ligamentum Flavum at the Upper Thoracic Spine: Case Report

Üst Torakal Vertebrada Ligamentum Flavum Ossifikasyonu: Olgu Sunumu

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ABSTRACT

Ossification of the thoracic ligamentum flavum is a rare condition and reports of this pathology have been limited mostly to oriental patients. Uppermost lesions are rare.

A 39-year-old Turkish male presented with spastic paraparesis. He was a piano carrier. Radiological examinations revealed extensive Th2-Th3 and Th3-Th4 interlaminar lesions. These lesions were excised.

Ossification of thoracic ligamentum flavum should be considered in the differential diagnosis of paraparesis, especially in patients whose spine is exposed to axial loading and stretch forces during work.

KEY WORDS: Laminectomy, ligamentum flavum, ossification, thoracic myelopathy.

ÖZ

Torakal ligamentum flavum kalsifikasyonu seyrek rastlanan bir durumdur ve bu konuyla ilgili bildiriler çoğunlukla doğu asya kökenli kişilerle sınırlıdır. En üst torakal lezyonlar seyrekdir. 39 yaşında bir erkek Türk hasta spastik paraparezi ile başvurdu. Hastanın mesleği piyano taşıyıcılığı idi. Radyolojik incelemeler Th2-Th3 ve Th3-Th4 interlaminer geniş lezyonları ortaya koydu. Bu lezyonlar operasyonla çıkarıldı. Torakal ligamentum flavum kalsifikasyonu özellikle çalışma sırasında omurgaları vertikal yüklenme ve gerilme kuvvetlerine maruz kalan kişilerde paraparezinin ayırıcı teşhisinde akla getirilmelidir.

ANAHTAR SÖZCÜKLER: Laminektomi, ligamentum flavum, ossifikasyon, torakal myelopati.

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INTRODUCTION

Although ossification of the thoracic ligamentum flavum (OTLF) was described as a cause of myelopathy in 1960 (13), it is still a rare condition and reports of this pathology have been limited mostly to oriental patients and to the lower thoracic spine. Affection of the upper third of the thoracic spine is rare. This report presents a male from Turkey with Th2-Th3 and Th3-Th4 interlaminar OTLF as an unusual case.

CASE REPORT

History. A 39-year-old Turkish male, working as a piano carrier, was admitted in February 2001 complaining of weakness of both legs. This weakness had been noticed by the patient two months ago and had progressed gradually.

Examination. Neurological examination revealed spastic paraparesis (muscle power in the lower limbs was grade 4/5), increased deep-tendon reflexes and sensory disturbance below the Th6 vertebral level.

Neuroimaging. Plain radiograms revealed no useful information. MRI of the thoracic spine showed well-delineated lesions with a hypo-intense signal at the Th2-Th3 and Th3-Th4 vertebral interlaminar levels in T1- and T2- weighted images (Figure 1) . The one at the Th2-Th3 level was more prominent, but there was no hyperintensity in the spinal cord in either T1- or T2-weighted images. Computerized tomography of the spine demonstrated bilateral ossified ligamentum flavum at these vertebral levels, joining at the midline (Figure 2).

Hematological and biochemical investigation results were normal.

Operation. The patient underwent laminectomy of Th2-Th3 and Th4. The ossified ligamentum flavum was adherent to the dura mater, especially at the level of Th2. Both the outer layer of the dura and OTLF were separated from the inner dural layer together, using sharp dissection.

Postoperative Course. The patient showed rapid improvement after operation. His paraparesis and sensory disturbances resolved completely six months after discharge. He had only little residual spasticity.

Figure 1: Midsagittal T2-weighted MRI image shows areas of low signal intensity at the Th2-Th3 and Th3-Th4 levels invaginating into the spinal canal from the back. The impression at the Th2-Th3 level is more prominent than the one at Th3-Th4 interlaminar space.

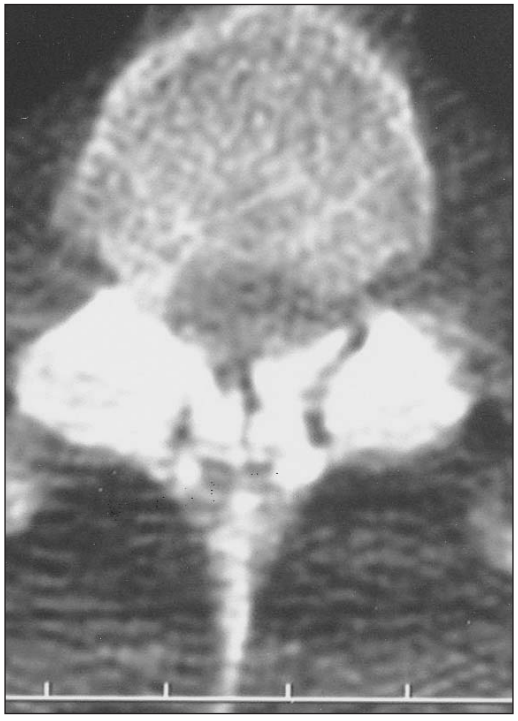

Figure 2.: Axial computed tomography image showing high-density masses, compressing the spinal cord from the back, at the Th2-Th3 interlaminar space.

DISCUSSION

Thoracic ossified ligamentum flavum as a cause of cord compression is not a common entity. Most clinical series before Hamouda's series in 2003 (2) had been from Japanese/Chinese patients (3, 12).

The majority of OTLF cases involve the lower third of the thoracic spine (4). There are not many cases involved at the high thoracic vertebral levels (Table I). OTLF causing symptomatic spinal cord compression has never been found at a level as high as Th2-Th3 as described in Turkish people to our knowledge.

The patient's job is also note-worthy. He was a piano carrier, carrying pianos with a strap supported by his upper thoracic region at the affected vertebral levels. We therefore thought that his job could be responsible for his pathology. Mechanical factors have been postulated as predisposing factors (1). Constant stress and stretch forces on these vertebral levels can be responsible for the breakdown of the elastic fibers and the following degeneration in ligamentum flavum.

Unfortunately, the ligamentum flavum specimen was not subjected to histological examination. The location of the pathology at the thoracic region, male patient and the relatively young age correspond with ossification of ligamentum flavum (9), not calcium pyrophosphate dihydrate deposition disease (5, 6).

The results of decompressive surgery can be favorable. This is especially true if intramedullary hyperintensities are absent on preoperative T2-weighted MRI studies (10). Although rare, ossified ligamentum flavum, even at high thoracic levels, should be considered as a cause of spinal cord compression in all patients but especially in a patient with myelopathy whose spine is exposed to axial loading and tensile forces at work, such as a porter or carrier.

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Table I. The cases of highest levels of OTLF reported in English literature by now.

Author	Year Highest levels of OTLF in the series	Race	Operation
Shenoi (7)	1997 Th2-Th3 (1 case)	Japanese	Yes
Xiong (12)	2001 Between Th1 and Th4 levels (3 cases)*	Chinese	Yes
Shiokawa (8)	2001 Th2-Th3 (1 case)	Japanese	Yes
Vasudevan (11)	2002 Th1-Th2 (1 case)	S. Korean	Yes
Hamouda (2)	2003 Th1-Th2 (1 case), Th2-Th3 (3 cases)	Tunisian	Yes
Sucu	2003 Th2-Th3 (1 case)	Turkish	Yes

*Xiong reported that in 3 cases of his series the levels of OTLF were between Th1 and Th4. But he didn't reported which levels exactly.