



(CASE REPORT)



Cervical ossification of the posterior longitudinal ligament revealed by cervical trauma: A case report with literature review

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Abstract

Background: Ossification of the posterior longitudinal ligament (OPLL) refers to bone formation within the posterior longitudinal ligament of the spinal column. This disease of the cervical spine results in a reduced volume of the spinal canal and can cause spinal cord damage. The onset of cervical OPLL is insidious. OPLL may increase the risk of spinal cord injury with various neurological deficits after minor trauma. An acute event can reveal a previously unknown or paucisymptomatic cervical OPLL.

The aim: To present a case of unknown cervical OPLL revealed by cervical trauma after a traffic road accident.

Case report: A 47-year-old female presented intractable cervicobrachial neuralgia in the posttraumatic aftermath of a traffic road accident. Computed Tomography (CT) and Magnetic resonance imaging (MRI) demonstrated an isolated OPLL from C5 to C6, causing significant nerve compression operated via anterior approach with discectomy and intervertebral cervical cage.

Conclusion: Acute cervical trauma must be considered a mode of revelation of previously unknown or paucisymptomatic cervical OPLL and must be considered in the emergency room.

Keywords: Ossification of the posterior longitudinal ligament; Moroccan female; Traffic road accident; Cervical spinal radicular compression; Surgery

1. Introduction

Ossification of the posterior longitudinal ligament (OPLL) in the cervical spine refers to a disease where aberrant proliferation and OPLL in the cervical spine result in a reduced volume of the spinal canal and thus cause spinal cord damage. OPLL is recognized as the leading cause of cervical myelopathy in Japan [1]. Patients complain of progressive pain in the neck and in the occipital area, and this is followed by paresthesia and weakness in the upper and lower extremities [1-4].

OPLL occurs as heterotopic bone forms in the posterior longitudinal ligament, resulting in neural compression, myelopathy, and radiculopathy. OPLL was first described by Key in 1838, and the concept of OPLL has been widely used since Tsukimoto published an autopsy case report on this subject in 1960 [1]. The incidence is higher in East Asian populations (2.4%) compared to Caucasians (0.2-0.7%) [2,4-6].

OPLL may increase the risk of spinal cord injury with various neurological deficits after minor trauma. Patients with OPLL sometimes present with acute cervical cord injury after only minor trauma, such as a fall to the ground or a post-

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traffic road accident. Cervical rotatory manipulation of the cervical spinal cord in traditional practice was reported as revealing OPLL [2-4].

A case of OPLL revealed by a trauma-traffic road accident with a hyperalergic cervico-brachial neuralgia is reported.

2. Case report

A 47-year-old Moroccan female was referred to neurosurgery for intractable and hyperalergic right cervico-brachial neuralgia. The medical history was unremarkable. The patient presented many years ago with episodic cervicgia, which was managed conservatively without any neurological imaging. A month ago, she explained in a traffic road accident with a rebellious right cervico-brachial neuralgia. At admission, she was in good health. A neurological exam showed no abnormalities but hyperalgesia, and untractable cervicobrachial neuralgia with visual analogic echelle at 8/10. Cervical computed tomography (CT) scan in sagittal bone view showed calcification of posterior longitudinal ligament in C5-C6 level. In axial and T1-weighted magnetic resonance imaging (MRI), images, and T2-weighted sagittal cervical, MRI showed disc herniation in C5-C6 level and axial T2-weighted median and paramedian cervical disc herniation with spinal cord compression. Nearly 60% of the cervical spinal canal was compressed. The final diagnosis was OPLL with acute nerve compression following a cervical trauma. The patient underwent surgery via right anterior approach. After a total discectomy, a drilling of the ossification was done. An intervertebral cage was placed between C5 - C6 level (**Figure 1E**). A good decompression was obtained. The postoperative was unremarkable with the disappearance of the neuralgia. With a 10-month follow-up, the patient was very satisfied.



Figure 1 Cervical CT scan in sagittal bone view showing ossification of posterior longitudinal ligament in C5-C6 level (A) and in axial view (B)

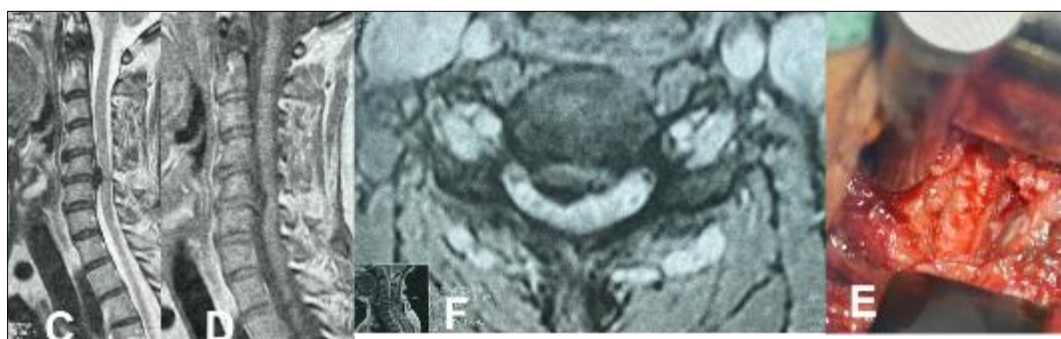


Figure 2 T2-weighted MRI and T1- T1-weighted sagittal cervical MRI showing a disc herniation in C5-C6 level (C, D) and axial T2-weighted; median and right paramedian cervical disc herniation in hypointense signal with near fifteen percent compression. (E): Intra-operative microscope picture showing anterior cervical decompression of C5-C6 level. Cervical ossification of the posterior longitudinal ligament in a 47-year-old female

3. Discussion

Our patient presented acute nerve compression with OPLL revealed by acute trauma. This finding is rare in our practice. OPLL may result in compression of the spinal cord and nerve roots. The onset of OPLL is insidious and often goes

unnoticed by patients until they experience a sudden decline in muscle strength or even paralysis. Patients with OPLL sometimes present with an acute cervical cord injury after only minor, cervical manipulation or severe cervical trauma [2,3].

The prevalence of OPLL varies geographically. The incidence is higher in East Asian populations (2.4%) compared to Caucasians (0.2-0.7%) [2,4-6], with rates of 1.8%–4.1% in Japan, 0.2%–1.8% in China, and only 0.01%–1.7% in the United States and Europe [4,5,6]. The male-to-female ratio is approximately 2:1 [5,9]. The Bakhsh study of 2917 patients reaffirms previous data, with an OPLL prevalence of 2.5% [8].

The OPLL is typically seen in the mid-cervical spine and results in central canal stenosis, predisposing the patient to cord injury from minor trauma: cervical: 75%; thoracic: 15% and lumbar: 10%.

The etiology of OPLL is multifactorial, including genetic, metabolic, and anatomic factors. The pathological mechanism underlying the OPLL process is influenced by both genetic and non-genetic factors. Non-genetic contributors include dietary factors, obesity, mechanical stress stimulation, trauma-induced ligament injury, and hormone levels. These findings suggest the involvement of phosphorus metabolism, inflammatory response, and FGF-23 in the initiation and progression of OPLL [2,4,5,9].

Typically, OPLL appears as continuous or segmental ossification along the posterior longitudinal ligament, creating a bony mass, and usually reveals a continuous low-signal intensity mass on T1-weighted images, corresponding to the ossified ligament. OPLL generally occurs in the cervical spine and involves no more than three vertebral levels [3-6].

Clinically: Patients may be asymptomatic or have evidence of radiculopathy and/or myelopathy. If present, symptoms usually manifest in the 4th–6th decades of life. The disorder is recognized as the leading cause of cervical myelopathy in Japan [7]. Patients complain of pain in the neck and in the occipital area, and this is followed by paresthesia, weakness in the upper and lower extremities, and sphincter dysfunction. Paresthesia is a very common symptom, and it is found in up to 70% of patients. Because OPLL is a progressive disease, the bridging of ossified lesions to the vertebral body gradually increases, thereby decreasing the mobility of the cervical spine; thus, cervical spine function may decrease over time [2,3,4]. OPLL may increase the risk of spinal cord injury with various neurological deficits after minor trauma. An acute event can reveal a previously unknown or paucysymptomatic cervical OPLL.

Radiological assessment and classification: OPLL was first classified by Tsukimato [1], into four types: isolated, segmental, continuous, and mixed, depending on the extent, morphology, and imaging findings of the ossified ligaments. A plain radiograph of the cervical spine: continuous OPLL is visible as a linear density posterior to the vertebral body cortex. CT scan is the investigation of choice to determine the extent and thickness of the ossification. The CT is much more sensitive and indispensable to visualize the detailed outline of the ossified mass. Ossification can appear continuous (spanning multiple segments), segmental (discontinuous along vertebral bodies), and/or localized (spanning just the disc level). The ossification appears confluent with but is often thicker and denser than, the cortical bone of the vertebral body. On MRI, OPLL appears hypointense on T1 and T2-weighted images [2,3,6,7]. The intraspinal hypersignal in MRI is correlated to the severity of myelopathy.

Management: OPLL is a rare but potentially devastating cause of degenerative cervical myelopathy. Decompressive surgery is the standard of care for OPLL and can be achieved through anterior, posterior, or combined approaches to the cervical spine [3,6,9]. Intervertebral fusions are sometimes necessary after a corpectomy. Surgical treatment can provide a notable improvement in neurologic function.

Surgical decision-making accounts for multiple factors, including patient comorbidities, neurologic status, OPLL morphology, radiographic findings, and procedure complication profiles [5-7]. Cervical OPLL is associated with a high incidence of surgery-related complications. Multiple studies have demonstrated that the morphology and size of the OPLL, as well as the cervical alignment, have significant implications for the appropriate surgical approach and technique. Surgical intervention is necessary in severe myelopathies.

4. Conclusion

The majority of patients with OPLL in the cervical spine develop symptoms of nerve and spinal cord compression, which causes symptoms of cervical myelopathy or radicular compression. A CT scan in bone view and a cervical MRI make the diagnosis and classification of the type of OPLL and help in planning adequate surgery. Acute trauma must be considered a mode of revelation of previously unknown OPLL in the emergency room. General practitioners and emergency doctors must be aware of this pathology in regions where the incidence of this pathology is low.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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