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Case Report

Cervical cord compression due to ossification of the ligamentum flavum – A case report and literature review

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Received : 26 December 19
Accepted : 08 February 20
Published : 06 March 20

DOI
10.25259/SNI_605_2019

Quick Response Code:

ABSTRACT

Background: Symptomatic compression of the cervical spinal cord by ossification of the ligamentum flavum (OLF) is rare. It typically involves the elderly and is particularly prominent in the Asian male population. Here, we present a 70-year-old Pakistani female who became quadriparetic due to OLF.

Case Description: A 70-year-old female became increasingly quadriparetic over 3 months duration, but exhibited preservation of vibration and proprioception. The cervical magnetic resonance/computed tomography revealed dorsal OLF measuring 7 mm × 25 mm × 14 mm. Two months following a decompressive laminectomy, her symptoms fully resolved.

Conclusion: Although rare in older patients, cervical OLF may contribute to significant cervical myelopathy characterized by a progressive quadriparesis that can be readily resolved with a decompressive laminectomy.

Keywords: Ligamentum flavum, Ossification of ligamentum flavum, Quadriparesis

INTRODUCTION

Ossification of the yellow ligament (OYL) (ossification of the ligamentum flavum [OLF]) most frequently occurs in the thoracic spine of elderly males of Asian descent.[4,5] It is typically responsible for the onset of myelopathy. Here, we present a rare case of cervical OLF occurring in a 70-year-old Pakistani female who became progressively quadriparetic over 3 months duration. Both the magnetic resonance imaging (MRI) and computed tomography (CT) scans confirmed marked cervical OLF contributing to significant dorsal/lateral thecal sac/cord compression/spinal stenosis. Two months following a cervical laminectomy, she regained normal neurological function.

CASE REPORT

Presentation of spastic quadriparesis

A 70-year-old female presented with a progressive spastic cervical myelopathy/quadriparesis of over 3 months duration. She exhibited 4/5 strength in the right upper/right lower extremity, 3/5 strength in the left lower extremity, and bilateral Babinski responses without any sensory findings.

MR/CT findings

The CT scan directly confirmed hyperdense posterolateral ossification indicative of OYL measuring 25 mm × 14 mm × 7 mm [Figure 1]. The MRI examination of the cervical spinal documented cervical stenosis with cord compression at the C2 level due to OLF; the T2-WT MRI demonstrated a hypointense posterolateral lesion consistent with OLF measuring approximately 7.02 cm × 2.58 cm (CC × AP) [Figure 2]. Both MR and CT studies demonstrated that OLF reduced the sagittal canal diameter of the spinal canal to just 3.55 mm.

Figure 1: Cervical midline sagittal noncontrast two-dimensional computed tomography showed a dense ligamentous calcification central dorsally in the upper cervical canal contributing to marked canal narrowing 25 mm × 14 mm × 7 mm, and severe cord compression. Of interest was the clear separation of the ossification from the dorsal laminae of C1 and C2. This brings into consideration whether the ossification of the yellow ligament has penetrated the dura, as this image is similar to the double-layer sign seen in the subaxial spine.

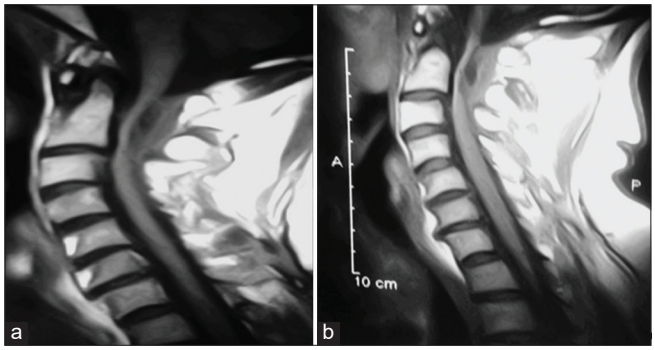

Figure 2: (a and b) T1WI midline and paramedian sagittal magnetic resonance imaging of cervical spine showing a hypointense area of calcification/ossification 7.02 cm × 2.58 cm (CC × AP) opposite the C1/C2 level resulting in severe thecal sac and spinal cord compression.

Patient outcome

The patient underwent a decompressive C1-C2 cervical laminectomy. At surgery, OLF had to be carefully dissected away from the dura using an operating microscope; a cerebrospinal fluid (CSF) leak was averted. Eight days postoperatively, the patient exhibited significant improvement, and within 2 postoperative months, regained normal function.

DISCUSSION

Frequency of OLF

The prevalence of OLF varies from 3.8% to 26.0% and is mostly typically found in the thoracic spine of older men of East Asian descent.[3-5] One report suggested that the overall incidence of asymptomatic OLF was 38.5%, 26.5%, and 0.9%, respectively, in the thoracic, lumbar, and cervical spine.[6] Rahimizadeh *et al*. found the prevalence of C1-C2 OLF to be 0.9% out of 69 cervical cases.[5] Here, we observed C1-C2 OLF in a 70-year-old female.

Pathology of OLF

The ligamentum flavum is composed primarily of elastic fibers. Overtime, and with continued mechanical stress, the normal fibrous tissue can become hypertrophied and become replaced by cartilaginous cells (e.g., chondrometaplasia). The deposition of calcium pyrophosphate dihydrate crystals further contributes to the formation of the OLF mass. OLF may be also linked to environmental comorbidities including obesity, diabetes, and a poor diet, while others invoke a genetic predisposition.[2]

Treatment of OLF

There are no current pharmacological treatments for cervical OLF.[2] Therefore, patients presenting with cervical myelopathy typically warrant surgery consisting of decompressive laminectomy with/without fusion.[1,2] Due to OLFs potential for penetrating the dura mater, an operating microscope should be used to carefully remove OLF and avert a CSF leak.[5] Notably, the overall prognosis of cervical OLF is strongly linked to the preoperative neurological examination, duration/severity of myelopathy, and efficacy/safety of surgery.

CONCLUSION

Although rare, ossification of ligamentum flavum should be kept on the differential when faced with symptoms of decreased strength and mobility, especially in the elderly population.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Chachan S, Kasat NS, Keng PT. Cervical myelopathy secondary to combined ossification of ligamentum flavum and posterior longitudinal ligament-a case report. Int J Spine Surg 2018;12:121-5.
2. Christiano LD, Assina R, Goldstein IM. Ossification of the ligamentum flavum: A unique report of a Hispanic woman. Neurosurg Focus 2011;30:E15.
3. Geber J, Hammer N. Ossification of the ligamentum flavum in a nineteenth-century skeletal population sample from Ireland: Using bioarchaeology to reveal a neglected spine pathology. Sci Rep 2018;8:9313.
4. Oh JY, Wang VT, Teo TW, Kaliya-Perumal AK, Hee HT. Ossification of the yellow ligament in the cervical spine-an unusual location. Biomedicine (Taipei) 2019;9:14.
5. Rahimizadeh A, Asgari N, Soufiani H, Rahimizadeh S. Ossification of the cervical ligamentum flavum and case report with myelopathy. Surg Neurol Int 2018;9:263.
6. Song JY, Park JH, Roh SW. Ossified ligamentum flavum causing cervical myelopathy. Korean J Spine 2012;9:24-7.

How to cite this article: Iftekhar N, Rasool A, Khan I. Cervical cord compression due to ossification of the ligamentum flavum – A case report and literature review. Surg Neurol Int 2020;11:37.