



Case Report

A case of cervical OPLL and DISH mimicking stroke

Rudra Mangesh Prabhu¹ , Tushar N. Rathod², Shubhranshu S. Mohanty², Bhushan S. Hadole¹, Nandan A. Marathe³, Abhishek K. Rai¹

¹Department of Orthopaedics, Lokmanya Tilak Municipal Medical College and General Hospital, ²Department of Orthopaedics, Seth G.S Medical College and K.E.M Hospital, Mumbai, ³Department of Orthopaedics, Chaitanya Spine Clinic, Vasai, Maharashtra, India.

E-mail: *Rudra Mangesh Prabhu - rmp31395@gmail.com; Tushar N. Rathod - tnrathod@gmail.com; Shubhranshu S. Mohanty - drssmohantyortho@gmail.com; Bhushan S. Hadole - drbh130792@gmail.com; Nandan A. Marathe - nandanmarathe88@gmail.com; Abhishek K. Rai - abhishek110891@gmail.com



*Corresponding author:

Rudra Mangesh Prabhu,
Department of Orthopaedics,
Lokmanya Tilak Municipal
Medical College and
General Hospital, Mumbai,
Maharashtra, India.

rmp31395@gmail.com

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ABSTRACT

Background: Ossification of the posterior longitudinal ligament (OPLL) is a progressive disorder that mostly involves the cervical spine. It is more prevalent in East Asian countries. Patients typically present with the gradual onset of myelopathy, while about 5% show rapid progression.

Case Description: A 51-year-old diabetic and hypertensive male presented with a left-sided hemiparesis following trivial trauma. The first diagnosis was a stroke, but the subsequent workup proved negative. Subsequently, the MRI and CT studies demonstrated significant cord compression due to OPLL extending from C2 to C7. There was also a heterogeneous hyperintense intramedullary cord signal indicative of edema/myelomalacia in the retro-odontoid region. The CT also diagnosed C2–C7 diffuse idiopathic skeletal hyperostosis.

Conclusion: Patients with cervical myelopathy due to OPLL rarely present about 5% of the time with the acute onset of neurological deficit following minor trauma. Certainly, one must consider high cervical OPLL as responsible for hemiparesis in a patient whose brain MR has ruled out a stroke.

Keywords: Cervical, DISH, Hemiparesis, Myelopathy, OPLL

INTRODUCTION

Cervical ossification of the posterior longitudinal ligament (OPLL) typically presents as a slowly progressive painless myelopathy. However, 5% of patients may develop rapid progression of a neurological deficit following even minor traumatic events.

CASE REPORT

Clinical data

A 51-year-old male acutely presented with what appeared to be a “left-sided hemiparesis” following a fall. The neurological examination showed severe left upper extremity monoplegia (0/5), sensory loss diffusely in the left arm, a mild left leg paresis (4/5 level), and bilateral hyperactive reflexes with Babinski responses in the lower extremities. The brain MR ruled out a stroke, while a lateral radiograph of the cervical spine showed both diffuse idiopathic skeletal hyperostosis (DISH) and OPLL [Figure 1]. In addition, the MRI demonstrated significant cord compression due to OPLL extending from C2 to C7 along with a heterogeneous hyperintense signal within the cord (i.e., edema/myelomalacia) in the retro-odontoid region. The cervical CT

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Figure 1: A lateral radiograph of the cervical spine shows the presence of ossification along the anterior and posterior aspects of the vertebrae.

further showed hyperdense mixed OPLL that was continuous from C2-C5 and segmental at C6-C7, along with DISH from C2 to C7 [Figure 2].

Surgical technique

Due to the presence of a positive K-sign [Figure 2] (i.e., a vertical line drawn between mid-canal points opposite C2 and C7 – if the OPLL mass falls anterior to that line, it is termed as the positive K-sign), the presence of multiple level OPLL, and an adequate cervical lordosis, the patient was managed with laminectomy and posterior fusion. A midline laminectomy was performed from C1 to C6 along with foramen magnum decompression. This was accompanied by more extended bilateral foraminotomies at the C4/C5 level to help avoid postoperative C5 palsies. Lateral mass screws were then placed bilaterally in C1 and C3–C6, while bilateral pedicle screws were affixed to C2. The construct was completed with rods and bone graft fusion was achieved from C1 to C6 [Figure 3]. One year later, the patients' modified Japanese Orthopaedic Association score improved to 13, and the MRI showed adequate cord decompression with a reduction of the intrinsic cord myelomalacia [Figure 4].

DISCUSSION

Using the positive or negative K-sign to determine whether anterior or posterior cervical surgery is warranted for OPLL

The positive and negative K-signs are typically utilized to determine whether anterior only or anterior, posterior, or circumferential cervical surgery can be performed to address OPLL and any other pathology. The K-line is drawn vertically from the midpoint of the C2 spinal canal to the midpoint of the C7 spinal canal; if, as in this case, the ventral OPLL mass falls anterior to this line, this constitutes a positive K-sign,



Figure 2: (a) The ossified mass lies anterior to the K-line as demonstrated by the sagittal CT cut (b), (c) Axial CT cuts showing ossified posterior longitudinal ligament decreasing the space available for the cord.

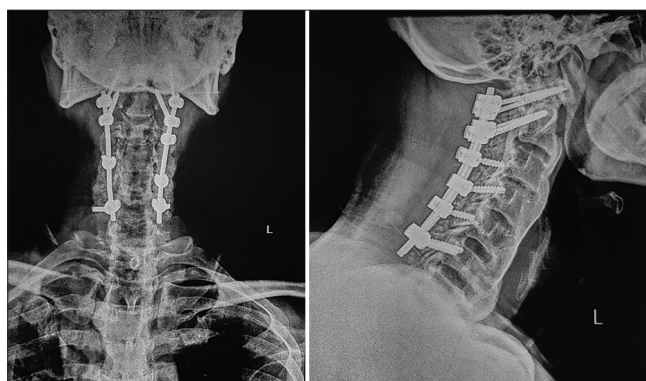


Figure 3: Postoperative radiographs show the final construct.

and anterior or posterior cervical surgery may be performed. Alternatively, the negative K-sign is present when the ventral OPLL mass extends posterior to the vertical line, thus largely dictating that an anterior cervical approach is warranted, typically a corpectomy rather than a discectomy.^[3]

Canal occupying ratio influencing surgical approaches: an additional “Check” on the K-signs

A systematic review of the literature indicates that although the anterior approach is associated with more surgical complications, it is preferred where the canal-occupying ratio is >50–60%. On the contrary, the posterior approach has fewer complications and is recommended when the canal-occupying ratio is <50–60%.^[2]

Role of fusion with OPLL

Multiple studies report better results if cervical OPLL is treated with both decompression and fusion. Fusion

Table 1: Review of the cases with OPLL showing an acute presentation and rapid progression.

Author	Year	Findings	Diagnosis	Management	Outcome
Tanida <i>et al.</i> ^[8]	2016	64-year-old male No trauma Acute tetraplegia	OPLL + cord infarct	Emergency LOP C3–C6	No improvement; ventilator dependent
Mizuno <i>et al.</i> ^[5]	1999	63-year-old male Quadriplegia following a neck injury	OPLL C2–C7	Medical treatment	Fatal sepsis due to UTI 4 yrs later
Tan <i>et al.</i> ^[7]	2015	53-year-old male Acute quadriparesis following an assault	Mixed OPLL: continuous C2–C4; segmental C5–C6	C3–C6 double door LOP	Uneventful recovery
Present study	2022	51-year-old male Acute LUE monoplegia/left leg paresis following a fall	OPLL C2–C7; DISH C2–C7	Lam C1–C6 Fusion C1–C6	Uneventful recovery

OPLL: Ossification of the posterior longitudinal ligament, UTI: Urinary tract infection, LOP: Laminoplasty, LAM: Laminectomy, LUE: Left upper extremity, DISH: Diffuse idiopathic skeletal hyperostosis

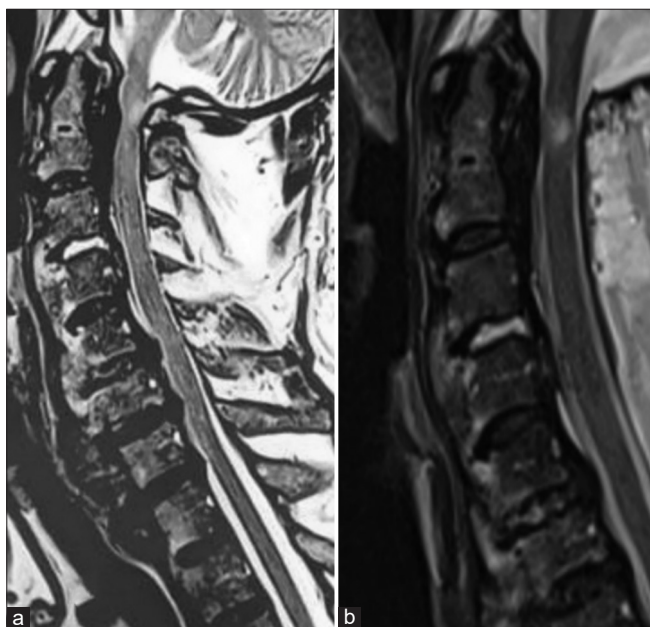


Figure 4: (a) MRI at presentation demonstrating cord compression due to the OPLL mass with effacement of the anterior thecal sac. (b) MRI at a follow-up of 1 year showed improvement in the cord compression and a reduction in the myelomalacia cord changes. OPLL: Ossification of the posterior longitudinal ligament.

accelerates recovery and slows/eliminates the rate of OPLL progression.^[4] Although laminoplasty or laminectomy are appropriate options for patients with an adequate lordosis and positive K-sign and/or a canal-occupying ratio of <50–60%, studies largely recommend these patients also undergo fusion.^[6]

5% incidence of acute deterioration seen in OPLL

Around 75% of patients with OPLL deteriorate in a step-wise manner, 20% worsen slowly, while 5% present with acute

neurological worsening^[1] [Table 1]. Table 1 highlights the cases with OPLL that showed an acute presentation and a rapid progression.^[8,5,7] In the present report, following trivial trauma, our patient presented with an acute left hemiparesis and anterior cord compression from C2 to C7 attributed to OPLL (i.e., once the brain MR ruled out a stroke).

CONCLUSION

Once the brain MR ruled out a stroke, our patient's acute left hemiparesis was attributed to both MR/CT documented cervical OPLL extending from C2 to C7 that warranted a posterior cervical decompression with fusion.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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