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Sudden Neurological Decline Post Spinal Decompression: Insights into White Cord Syndrome

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Objective:

White cord syndrome is a rare but serious complication characterized by sudden neurological deterioration immediately following spinal decompressive surgery. It is thought to result from reperfusion injury to the spinal cord post-decompression. Timely diagnosis is critical to ensure adequate spinal cord perfusion by hemodynamic optimization, early steroid administration, and physiotherapy initiation to promote recovery outcomes.

Methods:

We report a case of this uncommon condition in a 54-year-old gentleman who presented with four-limb weakness, clinically consistent with cervical myelopathy.

Results:

Fig. 1


Fig. 2

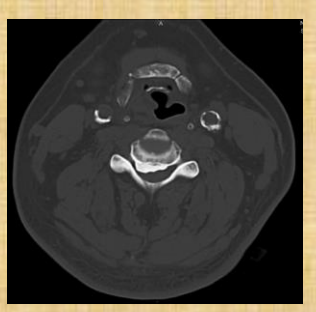
Fig. 3

Initial cervical spine radiographs (Fig. 1) and CT (Fig. 2, 3) revealed extensive C2-4 continuous-type ossification of posterior longitudinal ligament (OPLL), causing moderate to severe spinal stenosis.


Fig. 4

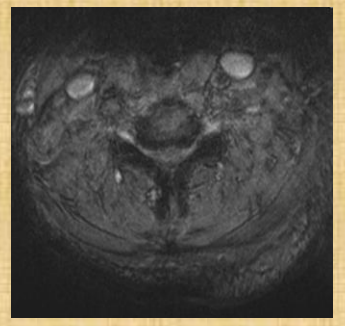
Fig. 5

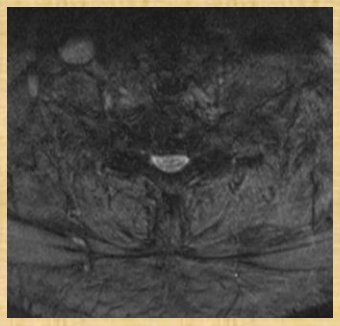
Fig. 6

Preoperative MRI showed moderate spinal stenosis from OPLL and disc-osteophyte complex, cord impingement (Fig. 4) and myelopathic signal changes especially at C4/5 (Fig. 4, 5) and C6/7 level (Fig. 4, 6).

The patient underwent C2-7 full laminectomy for decompression and cervico-thoracic posterior spinal fusion. The surgery was uneventful, with intraoperative findings confirming no residual compression, positive cord pulsation, and no cerebrospinal fluid leakage under the Valsalva maneuver.

However post-operatively, the patient experienced a sudden and significant decline in limb power, worse than his preoperative state – Proximal upper limb power was rated 0/5, while the lower limb power was 2/5. Sensation in all limbs remained intact.

Fig. 7

Fig. 8

Urgent postoperative MRI (T1W Fig. 7; Fat saturated T2W Fig. 8) showed no significant residual spinal stenosis. However, new, extensive abnormal high T2-weighted cord signals were observed from C2-5, along with cord expansion, suggestive of white cord syndrome following uneventful spinal decompression. Note acute posterior epidural hematoma from C2/3 down to C6 levels, with no significant mass effect.

Conclusion:

Patients diagnosed with white cord syndrome typically experience favorable recovery; however, outcomes can be variable. It is worth noting that abnormal MRI signal changes often persist despite clinical improvement. Multidisciplinary collaboration from radiologists, orthopedic surgeons, and physiotherapists, is essential for prompt diagnosis, early treatment initiation, and comprehensive care of patients.