

Case Report

Arachnoid web: a mystery unravelled

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ABSTRACT

A 47-year-old lady came with complaints of dull aching low backache and numbness over both the lower limbs since six months, aggravated since one week. She had tenderness over dorsal (D8-D10) and lumbar (L4-L5) spinal and paraspinal regions. Radiographs were inconclusive. Plain and contrast Magnetic resonance imaging (MRI) of the dorso-lumbar (D-L) spine with whole spine screening were also inconclusive initially. But close observation and serial viewing of all the sections revealed features of an arachnoid web at D7-D8 vertebral level. Patient underwent D7, D8 laminectomy with durotomy and arachnoid web excision. She had considerable improvement in her symptoms after the surgery. Hence, prompt recognition and early surgery ensure good outcomes in this uncommon yet relevant clinical entity.

Keywords: Arachnoid web, MRI, Scalpel sign, Laminectomy, Durotomy, Excision

INTRODUCTION

Arachnoid webs are intradural, extramedullary abnormal bands of arachnoid tissue extending to the pial surface of the spinal cord. Literature reports only 31 cases of spinal arachnoid webs, out of which only 13 have been confirmed at surgery.¹ These statistics raise a suspicion as to whether it is indeed a rare entity or merely under-diagnosed or under-reported.

In this report, we present a case of spinal arachnoid web to highlight the need for high index of suspicion to recognize the elusive “scalpel sign” on magnetic resonance imaging (MRI) and to throw light on the role of surgery in treating this rare condition.

CASE REPORT

A 47-year-old lady came with complaints of dull, aching low backache since six months, aggravated since one

week. Pain was continuous, gradually progressed from moderate to severe in intensity and aggravated on sitting and walking. She gave history of numbness in both the lower limbs but denied history of radicular or claudication pain. She had no diurnal variation of pain. Her bowel and bladder habits were regular. Patient gave no history of fever, weight loss or loss of appetite. She gave history of fall from a bike two years back following which she had low backache which relieved with rest and medication. She was a known case of hypertension, on regular medication. On examination, there was no obvious spinal deformity. She had tenderness over D8-D10 and L4-L5 spinal and paraspinal regions. Straight leg raising test and Patrick's test were negative bilaterally. She had no sensory or motor deficits. Deep tendon reflexes were normal. Peripheral pulses were palpable.

Radiographs of the dorso-lumbar and lumbosacral spine showed no significant abnormality. Plain and contrast MRI

D-L spine with whole spine screening were inconclusive to begin with.

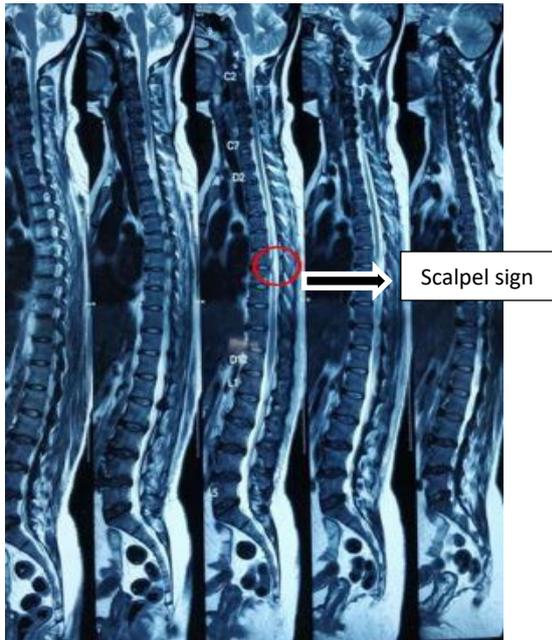


Figure 1: Sagittal view MRI showing “scalpel sign” at D7-D8 vertebral level.

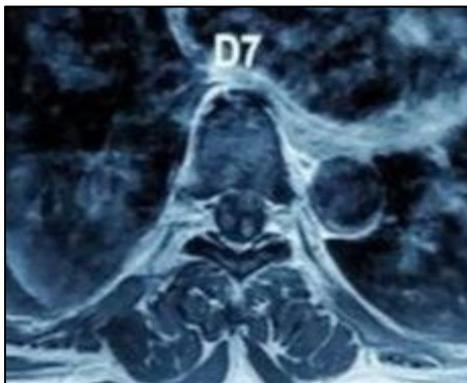


Figure 2: Axial view MRI showing lesion suggestive of arachnoid web at D7 vertebral level.

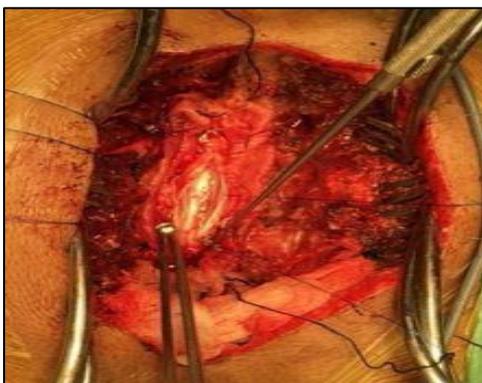


Figure 3: Intraoperative picture showing arachnoid web after durotomy.

Close observation and serial viewing of all the sections revealed a well-defined intradural extramedullary lesion of 16×3 mm on the posterior aspect of the spinal canal at D7-D8 vertebral level with spinal anteroposterior canal compromise (diameter- 5 mm), appearing hyperintense on T2 weighted images and hypointense on T1 weighted images, with no cord edema. The lesion showed no post contrast enhancement. The classical “scalpel sign” pointed to a diagnosis of arachnoid web (Figures 1 and 2). Patient underwent D7, D8 laminectomy with durotomy and arachnoid web excision (Figures 3 and 4). She improved symptomatically. Mobilisation was delayed by 2 weeks as patient had cerebrospinal fluid (CSF) leak from the surgical site which settled spontaneously. She resumed her duties as a teacher one month after the surgery.



Figure 4: Arachnoid web specimen after excision.

DISCUSSION

Arachnoid webs are considered to be rare variants of arachnoid cysts which are most commonly found in the thoracic spine.² There are reports which suggest that they could be remnants of disrupted or collapsed arachnoid cysts or even incompletely formed arachnoid cysts. Although MRI is considered to be the gold standard investigation to diagnose arachnoid webs, it has been found to have suboptimal sensitivity probably due to the thin size of the webs as compared to the adjacent tissue. Yamaguchi et al stated that arachnoid lesions can be identified on MRI only when they cause spinal cord deformity and obstruct CSF flow.³ The “scalpel sign” demonstrated on MRI has been found to be a reliable indicator of a spinal arachnoid web.⁴ Nevertheless, this sign could also indicate a dorsal arachnoid cyst, ventral spinal cord herniation secondary to repeated occult trauma or an idiopathic spinal cord herniation. Computed tomography myelogram, which depends on the principle of CSF flow obstruction, often fails to detect arachnoid webs as they rarely cause complete obstruction. Grewal et al described a relatively novel MRI technique, MRI with constructive interference in steady state (CISS), to detect webs where myelogram was only suggestive.⁵ Chang et al described another MRI based technique, cardiac gated phase-contrast cine-mode MRI in multiple axial planes, to

diagnose arachnoid webs.⁶ This technique demonstrates a one-way valve like the flow of CSF due to the web and accurately localizes the web. Although several such investigations have been described in the literature, not many can be routinely done as they are only done in specialized centres. Both conservative and surgical management have been described for this condition. However, laminectomy, durotomy and surgical release of the compressing bands continues to be the gold standard of treatment. Wali et al performed intraoperative monitoring of somatosensory evoked potentials (SSEP) during laminectomy and excision of the web and found that improvement in SSEP was consistent with simultaneous decompression of the compressed cord.⁷ Monitoring of SSEP is known to be an invaluable tool to assess the extent of decompression and a good predictor of successful clinical outcome.⁸ However, neuromonitoring was not feasible in our setup and hence, we had to rely solely on the patient's post-operative functional outcome to assess the extent of decompression.

CONCLUSION

Recognition of the "scalpel sign" is of paramount importance in diagnosing spinal arachnoid webs. A high degree of suspicion is required to pick up this invaluable, yet elusive, sign. The excellent post-operative outcome justifies the need for surgery as the definitive line of treatment for this rare clinical entity.

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