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(CASE REPORT)

Post-traumatic arachnoiditis ossificans of the thoracic spine: A case report with literature review

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Abstract

Background: Post-traumatic thoracic arachnoiditis ossificans (AO) is extremely rare in clinical practice. The lesion is a rare pathological entity usually confined to the thoracic and high lumbar regions that can cause progressive spinal cord myelopathy.

The aim: To report a case of AO and to report briefly the literature.

Case report: A case of posttraumatic AO secondary to lumbar fixation and decompression surgery for unstable thoracic fractures is reported.

Conclusion: A thoracic computed tomography scan is the best investigation of the diagnosis of arachnoiditis ossificans. Magnetic resonance imaging of the spinal cord and potential coexisting pathology make both necessary.

Keywords: Post-traumatic; Thoracic spinal cord injury; Computed tomography; Calcification; arachnoiditis ossificans

1. Introduction

Arachnoiditis ossificans (AO) is a rare spinal pathology that develops because of bony metaplasia secondary to chronic inflammation. AO may present with debilitating myelopathy secondary to spinal cord or nerve root compression [1-3].

AO is extremely rare, most commonly in the thoracic spine. AO is an uncommon end-stage appearance of chronic adhesive arachnoiditis secondary to a variety of causes, including previous trauma, surgery, myelography, infection, and subarachnoid hemorrhage [4,5,6].

Post-traumatic AO of the thoracic spine is rarely reported and can present as a delay debilitating myelopathy secondary to spinal cord and nerve root, compression [4].

This article presents an unusual case of AO after spinal surgery.

2. Cases report

A 32-year-old man was referred for post-traumatic paraplegia following a rod traffic accident. He presented with burst fractures of the vertebral body of T8-T9 resulting in Frankel Grade D paraplegia. Rectal sphincter tone was diminished. Sensory examination showed decreased pain and tactile sense bilaterally. He underwent posterior transpedicular screw

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stabilization and decompression of the spinal canal. His neurological status partially improved, with almost incomplete motor and sensory function recovery.

For 3 years he presented progressive neurological deterioration with pain in his legs. Axial and sagittal lumbar CT scan revealed intradural, epidural, and periarticular ossifications extending from T8 to T10 (**Figure 1**). Routine Blood test, parathormone, calcium, and phosphorus were without abnormalities. The final diagnosis was arachnoiditis AO. The patient's symptoms were managed by non-steroidal anti-inflammatory drugs and physiotherapy. The calcifications were extensive and did not require surgery.

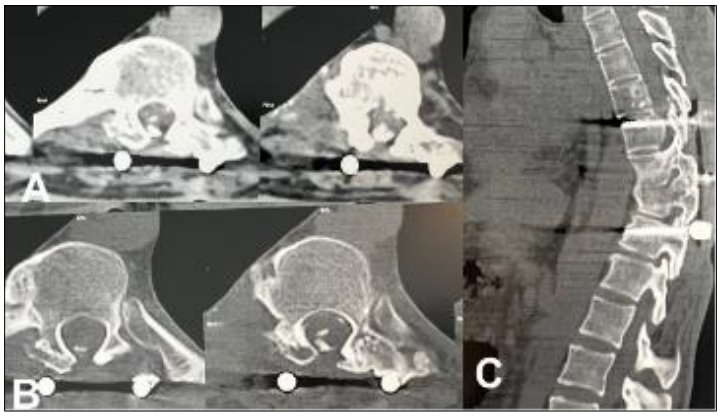

Figure 1 Axial (A and B) and Sagittal (C) CT-scan of the thoracic spine, performed 3 years after surgery, showing intradural, epidural, and periarticular ossifications extending from T8 to T10. Post-traumatic arachnoiditis ossificans of the thoracic spine in 32-year-old man.

3. Discussion

Arachnoiditis ossificans (AO) of the spine is a rare entity defined as an ossification of the leptomeninges resulting in neurologic decline. Post-traumatic AO in cauda equina or thoracic spine is extremely rare in our clinical practice, and its etiology, pathogenesis, treatment, and prognosis are unclear [2].

AO is a rare spinal pathology first described in 1971 that is defined as bony metaplasia of the arachnoid membrane secondary to a chronic inflammatory state. Inflammation occurs secondary to spinal injury or manipulation though rarely it may be idiopathic. As a result of chronic inflammation, dural adhesions, and scar tissue can form which encapsulate dura and nerve roots and disrupt cerebrospinal fluid flow. Rarely, this chronic inflammation may progress to AO [1-3,5,6].

The thoracic spinal cord is involved in 90% of cases. The most frequent site of ossification was at the conus and cauda equina. Four patterns of ossification were identified, including central, nerve root encasing, weblike, and peripheral [5].

Multiple factors are responsible for AO, some of which are local, whereas others are general, possibly of a metabolic or hormonal nature. Mechanical dural sac lesions with probable dural breaching during repeated surgery or following traumatic injuries may provide a propitious environment for the development of arachnoiditis [5,6].

Clinically: AO should be an incidental imaging finding, although invariably accompanied by evidence of a neurologic deficit, which usually progresses over several months to years [5]. The development of symptoms is related to calcification and compression of the spinal cord. Occasionally, syringomyelia and arachnoid cyst formation may be associated with AO as a result of disruption to cerebrospinal Fluid flow.

Neuroradiologically: the study of choice to identify AO is a nonenhanced CT scan because of its ability to detect ossified plaques with helical and multiplanar reconstruction. CT scan is the best investigation for stabilizing the diagnosis, but the acuity of MRI in imaging the spinal cord and potential coexisting pathology makes the need to perform both studies crucial. MRI findings of AO are subtle, usually hyperintense on T1-weighted images and hypo or hyperintense on T2-weighted sequences [4].

The management of AO remains a dilemma between conservative and surgical treatment [1-4]. AO treatment strategies have not been well-established and are typically decided on a case-by-case basis as determined by clinical presentation and morphology. Medical treatment may be applied in more mild cases or where resection is determined not to be possible, often consisting of anti-inflammatories, analgesics, and neuroleptic medications depending on symptomology. Surgical treatment involving decompression. The role of surgery is somewhat controversial due to the increased risk of developing ossifications at new sites. However, when neurological symptoms are invalidating, laminectomy, and if necessary, facetectomy, may provide adequate decompression of the neural elements [6]. Bagly. And al., [4], in his review report; demonstrated 60% of patients improved, 30% were unchanged, and 6% worsened postoperatively.

4. Conclusion

Post-traumatic AO is an infrequent cause of myelopathy, most commonly secondary to a previous spinal surgery. AO is best diagnosed using nonenhanced CT imaging. Treatment of AO is variable based on symptoms and morphology though it often includes a combination of surgical and medical management. Decompression of the cord should be considered only in patients with documented neurologic deterioration. This requires scholars to conduct more research and exploration in this entity.

Compliance with ethical standards

Disclosure of conflict of interest

All authors declare that they have no conflict of interest to disclose.

Statement of informed consent

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

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