Case Report

Oppenheimer's ossicles in the lumbar spine-a rare cause of lumbar canal stenosis

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1. Introduction

A 51-year-old male presented with chronic mechanical back pain for 2 years and a more recent onset neurogenic claudication with a claudication distance of 300 m for 6 months. Clinical examination documented painful spinal extension and normal neurology with no bowel bladder deficit. A provisional diagnosis of lumbar canal stenosis was made and a MRI was performed for further evaluation.

The MRI showed a large bilateral Oppenheimer's ossicles at the L3-4 level arising from the L3 inferior articular process. (Fig. 1) These unfused articular process remnants caused a significant indentation of the ligamentum flavum with a resultant buckling onto the epidural space and central lumbar canal stenosis. These images co-related clinically with the presentation of neurogenic claudication. A CT scan was performed to clearly delineate the anatomy. (Fig. 2) No other abnormality was noted in the neural arch. The patient was treated with a short course of analgesics using NSAIDs for 1 week and Gabapentin for 4 weeks. The patient was started on a core and back muscle strengthening program with lumbar flexion exercises. The symptoms of the patient improved considerably and on last follow up of 18 months he was doing well.

2. Discussion

Oppenheimer's ossicles were first described by Albert Oppenheimer as non-fusion remnants of secondary ossification centres of articular process.¹ Oppenheimer described these on plain radiographs of asymptomatic individuals.¹ Since this original description multi-detector CT scans have been used to provide better delineated images of this otherwise uncommon neural arch malformation.^{2–5} They appear to have a smooth cortex and may partially lined by articular cartilage.³ The synovial joint of the facet joint often communicates with the cleft between the ossicles and the articular process.^{3,4}

The ossicles may form due to a horizontal cleft at the tip of the articular process which is the most frequent location.^{1,3–5} Less often they are formed by a vertical cleft in the articular process.^{1,5} The ossicles are best seen on sagittal CT scan sections and can be missed on

axial images if the slices are thick.⁴ These ossification centres should fuse between 17 and 25 years of age however they may remain unfused and have an incidence 1–2% based on radiograph and CT scan studies.³

Oppenheimer's ossicles are often discovered incidentally and remain asymptomatic in most individuals.^{1–5} They may be mistaken for fractures in traumatic clinical scenarios if knowledge of this entity is not borne in mind.^{3–5} They are smooth and rounded and this differentiates them from acute fractures and osteophytes. Occasionally calcified ligamentum flavum may be confused with this entity especially in older patients however the ossicles can be identified based on a location posterior to the ligamentum flavum.⁴

They may be associated with other malformations of the neural arch such as hypoplastic articular processes.⁵ They arise from the inferior articular process in majority of patients and may be bilateral in up to 80% scenarios.^{3–5} They are seen in the lumbar spine and affect the L2, L3 levels in the vast majority of reported literature.⁵

Symptoms may arise in the form of low back pain and can be treated with facet blocks as the synovial lining is continuous with the ossicles.⁵ Rarely as in the reported patient the ossicles can cause lumbar canal stenosis due to buckling of the ligamentum flavum which encroaches into the epidural space. They can be treated conservatively and may require surgery if they cause symptoms of lumbar canal stenosis which are refractory to conservative treatment.

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Ethical approval

The study was approved by the Institutional review board.

Conflict of interest

None.

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Fig. 1. A and B Sagittal and axial T2 weighted MRI images at the L3-4 level show significant narrowing of the spinal canal causing compression of cauda equina nerve roots secondary to the Oppenheimer's ossicles (arrows) and buckling of a thickened overlying ligamentum flavum (curved arrow).

Fig. 2. A and B Coronal and Sagittal multiplanar reformatted images in bone window showing: Two discrete bony fragments (asterix) with smooth well corticated margins in the region of bilateral L3-4 facet joints (right larger than left) adjacent to the tip of hypoplastic L3 inferior articular facets suggesting unfused ossicles. Also noted horizontal cleft (arrows) between the tip of L3 inferior articular facet and ossicles.

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