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Case Report

Incidental diagnosis of limbus vertebra in a patient with sciatica: a case report

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Abstract

The limbus vertebra is formed due to anterior herniation of the nucleus pulposus between the ring apophysis and the adjacent vertebral body, resulting in the formation of a triangular, smooth bony fragment that ossifies separately. It is commonly located in the mid-lumbar spine, usually at the antero-superior margin of a single vertebral body. We present the case of a 31-year-old male who presented to the Emergency Department with complaints of sciatica after bending forwards. The plain radiograph of the lumbo-sacral spine was suspicious for a L5 chip fracture but was diagnosed to have limbus vertebra and discharged. Limbus vertebra is generally identified incidentally, and most patients with anterior limbus vertebra are asymptomatic. Some patients with posterior limbus vertebra can present with symptoms of nerve compression. It can be mistaken for vertebral fracture, infection, degenerative disease of the spine or tumour, resulting in further diagnostic evaluation. Most patients are management conservatively, while those patients with symptoms of nerve compression requiring total laminectomy. Emergency physicians should consider the limbus vertebra as a differential diagnosis in patients presenting with lumbar pain, particular in young patients.

Keywords: Low Back Pain, Spine, Radiography, Intervertebral Disc, Trauma, Blunt Injury

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Introduction

A limbus vertebra is a well-corticated bony fragment adjacent to the vertebral body due to an unfused secondary ossification canter. It is usually triangular in shape and affects the angle of the vertebral body (1).

During childhood or adolescence, the vertebral ring apophysis starts to ossify, and it eventually fuses with the vertebral body during adulthood (2).

Limbus vertebra occurs as a result of remote trauma, chronic stress, or congenital abnormality. This leads to anterior herniation of the nucleus pulposus between the ring apophysis and the adjacent vertebral body, resulting in the formation a triangular, smooth bony fragment that ossifies separately and does not fuse with the vertebra, forming a limbus vertebra (1).

This pathophysiology is postulated to be similar to the development of Schmorl's nodes and Scheuermann's disease, wherein the nuclear material herniates centrally and at multiple levels in the lower thoracic spine, while the nucleus pulposus herniates anteriorly in limbus vertebra (3).

It has also been associated with a variant of COL11A1 collagen gene, and has been noted in athletes who undergo back loading in flexion, especially gymnasts and weight lifters (4,5).

This condition is often asymptomatic, but patients can present with non-specific symptoms like mechanical or inflammatory back pain, muscle spasm and/or radiculopathy. We present the case of a 31-year-old man with low back pain secondary to sciatica from bending forwards, and the presence of an L5 limbus vertebra on imaging. This case highlights that the presence of a limbus vertebra may be an incidental finding, and it is important to differentiate it from an acute fracture, tumor, or other co-existing pathology as the cause of back pain to avoid misdiagnosis.

Case

A 31-year-old male presented to the Emergency Department (ED) with complaints of sudden onset of low back pain after bending forwards to touch his toes.

The pain radiated down to the right buttock up to the toes of the right lower limb. He also complained of numbness with pins and needles sensation over the toes. He could not walk due to pain and called the ambulance. He denied urinary or bowel incontinence.

He did not have any back pain in the past and denied any falls. He had no past medical history.

On arrival in ED, his vital signs were stable and his pain score was 8/10. Clinical examination revealed tenderness over THE right L5-S1 paraspinal area, but there was no spinal step or deformity. He was unable to perform straight leg raising test due to pain.

There was no saddle anaesthesia and his anal tone was normal. Sensations over bilateral lower limbs as well as plantar reflex were normal.

He was given analgesia. Plain radiograph of the lumbo-sacral spine showed loss of lumbar lordosis and a triangular well-corticated fragment at the antero-superior aspect of the body of the L5 vertebra (Fig 1).

Fig 1. Lateral view of plain radiograph of the lumbar spine showing limbus vertebra (marked y arrow) at the anterosuperior margin of the lumbar (L5) vertebral body.

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This was suspicious for a chip fracture of the superior endplate of L5 vertebrae versus limbus vertebrae. The patient did not have any history of trauma or lumbar spine fracture in the past. His pain improved after analgesia in the ED and he was able to mobilize well. Hence, he was diagnosed to have sciatica with an incidental finding of the limbus vertebra and was discharged with anti-inflammatory medications, outpatient follow-up with physiotherapy, and orthopaedics.

The patient was asymptomatic when he visited the orthopaedic surgeon as an outpatient, and he did not undergo further evaluation or imaging and was advised to return back if he had recurrence of back pain with sciatica symptoms.

Discussion

Lumbar back pain, including sciatica, is a common presentation to the emergency department. It affects both males and females and the etiological diagnosis is often challenging. Numerous anatomical structures are responsible for low back pain eg. paravertebral muscle spasm, spinal ligament strain, vertebral injury, and surrounding nerve impingement causing sciatica. A limbus vertebra is a bony fragment adjacent to the vertebral body. The term limbus was first described by Schmorl, and is derived from the Latin word meaning fringe/edge (6). It is most commonly located in the mid-lumbar spine, usually at the anterosuperior margin of a single vertebral body. Its presence in the anteroinferior and posteroinferior corners is less frequent. There have been reported cases of limbus vertebrae in the cervical and thoracic spine (7).

There are two types of limbus vertebrae:

Anterior: more common, generally asymptomatic and detected incidentally

Posterior: less common, and can mimic intervertebral disc herniation symptoms due to nerve compression (8). Few studies describe an association between limbus vertebra and low back pain (9). In most patients, the diagnosis of the limbus vertebra is often incidental. Most patients present with symptoms of low back pain. The patient's presenting signs and symptoms, detailed physical examination, and plain radiography of the spine is usually adequate to make its diagnosis. It is important to consider its existence in back pain patients presenting to the ED, with or without a history of trauma.

Moreover, studies have reported that patients with an anterior limbus vertebra have a relatively higher incidence of intervertebral disc disease, as the presence of the anterior limbus vertebra can trigger the early onset of intervertebral disc degeneration (3, 10).

It is difficult to establish an exact prevalence of symptoms as most patients with anterior limbus vertebra is asymptomatic. But studies have reported that 11 –19% of patients with lumbar disc herniation were associated with posterior limbus vertebrae on radiographic imaging (8).

As discussed earlier, most patients with anterior limbus vertebra are asymptomatic. Our patient presented with symptoms suggestive of sciatica, and the neurological symptoms could have been caused by associated disc protrusion due to the sudden movement of bending forwards on a background of associated intervertebral disc disease. But as the patient's symptoms resolved in the ED and he was asymptomatic during the outpatient follow-up with orthopaedic surgeons, he did not undergo further evaluation or imaging for his sciatica presentation. So it is possible that our patient had an incidental diagnosis of limbus vertebra during the ED visit. On plain radiography, it appears as a well-corticated, triangular bony fragment with a sclerotic margin, and is located at the corner of a vertebral body (11). In cases where plain radiography is not diagnostic, especially in patients with posterior limbus vertebra at the level of L5 or S1 vertebrae, further imaging with CT or MRI may aid in better characterization of the lesion and its diagnosis. It is often misdiagnosed as a fracture (limbus or teardrop fracture), especially in a patient with a history of minor trauma. Limbus vertebra can be differentiated radiologically from a fracture by the presence of sclerotic border, which suggests the chronology of a limbus vertebra (11). The other differential diagnosis includes Schmorl's nodes, vertebral tumour, intercalary bone,

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degenerative disease of the spine, or infection (12).

Most patients are managed conservatively with analgesia for their complaints of back pain. The presence of the limbus vertebra does not require any specific treatment. If conservative treatment fails, or in patients with posterior limbus vertebra and associated nerve root compression, surgical treatment may be needed. Usually, surgical decompression and total laminectomy are recommended for the excision of the limbus fragment (8).

Conclusion

Emergency physicians should consider the limbus vertebra as a differential diagnosis in patients presenting with lumbar pain, especially in young patients with trauma or in sportsmen. It may be an incidental radiological finding in these patients. Physicians should attempt to differentiate it from an acute fracture, and also consider that its incidental identification could co-exist with other pathology-causing symptoms. This will help avoid further diagnostic evaluation or treatment procedures.

Conflict of Interest

All authors declare that they have no conflict of interest.

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