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## Case Report

# Traumatic lumbar vertebral ring apophysis fracture with disk herniation in an adolescent

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### ABSTRACT

We present a case of a 15-year-old male with history of back pain and bilateral lower limb radiculopathy due to fall. The magnetic resonance imaging scan showed disc bulge at L2-L3 level causing compression on contained nerve roots. In this case, computed tomography scan was indispensable for diagnosis and classification of the vertebral apophyseal fracture and to guide appropriate further management. Apophyseal ring fracture is an uncommon cause of back pain with radiculopathy in adolescents and athletes. High degree of suspicion is necessary to differentiate these injuries from disc herniation so as to further guide appropriate conservative or surgical management. The common cause of back pain in this population is related to musculoskeletal injuries. Lumbar disc herniation contributes to negligible number of cases in this age group, as against that seen in the adult population. An important and rare etiology to be considered for these patients includes vertebral ring apophyseal fracture.

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## Introduction

The purpose of this article is to draw attention to an unusual and extremely rare cause of back pain in adolescents and young adults, especially in athletes [1–4]. The common cause of back pain in this population is related to musculoskeletal injuries. Lumbar disc herniation contributes to negligible number of cases in this age group, as against that seen in the adult population. An important and rare etiology to be considered for these patients includes vertebral ring apophyseal fracture.

## Case report

We are presenting a case of 15-year-old male who came with history of minor accident in the form of fall from an autorickshaw followed by back pain and bilateral lower limb radiculopathy. The power in both lower limbs was Medical Research Council grade III of V at presentation. There was no bowel or bladder incontinence.

For the evaluation of back pain with radiculopathy, magnetic resonance imaging (MRI) of the lumbar spine was performed as the primary investigation. It showed a diffuse disc

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**Fig. 1** – T1 weighted (A) magnetic resonance imaging (MRI) image of the lumbar spine in sagittal plane shows a disc bulge at L2-L3 level. A defect with a small suspicious hypointense structure is seen along the posterior aspect of the inferior end plate of the L2 vertebral body. The disc material is seen herniating superiorly through this defect. Short tau inversion recovery (STIR) (B) image shows mild marrow hyperintensity in adjacent bone due to acute fracture. T2 weighted axial image (C) shows disc bulge producing mass effect on contained nerve roots at this level.

bulge with central disc component causing compression on contained nerve roots at L2-L3 level (Fig. 1). A linear T1 and T2 hypointense line was seen along the posterior aspect of the inferior end plate of the L2 vertebral body, which was suspicious for a fracture.

To confirm the same, a limited computed tomography (CT) scan of that region was performed (Figs. 2 and 3). It confirmed a mildly displaced apophyseal fracture of the L2 vertebral body involving its inferior end plate.

In view of neurodeficit in both lower limbs, the patient was subjected to an operative intervention in the form of discectomy and nerve root decompression at L2-L3 level. The fractured fragment was completely resected. On follow-up, patient had grade V by V power in both lower limbs with significant relief of symptoms and complete neurological recovery.

## Discussion

Fracture of the vertebral ring apophysis is an uncommon but important cause of back pain in adolescents [1]. It usually follows a strenuous physical activity or trauma.

The ring apophyses of vertebral bodies appear at age 5 years and fuse with rest of the body at 18-20 years, and in some cases up to 25 years. The annulus fibrosus is adhered to the superior and inferior vertebral plateau via the Sharpey's fibers and also to some fibers of the posterior longitudinal ligament. For these reasons, the fractures are commonly seen along the posterior aspect and in the midline [1,2].

During strenuous activity, there is avulsion of the vertebral end plate fragment along with herniation of the disc. The fracture usually occurs on posterior aspect of the end plate in

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