AO SPINE

Lumbar Posterior Ring Apophysial Fracture

Dr. Amit Kale
Professor and HOU unit 4
Department of Orthopaedics
Dr. dy patil medical college&Hospital, pimpri, pune

Learning Objectives

- To describe the characteristics of the posterior ring apophyseal fracture (PRAF)
- Discussing available options to treat PRAF
- Discuss a clinical case of PRAF
- Demonstrate case performed by UBE-ULBD

INTRODUCTION

- Lumbar posterior ring apophysis fracture (PRAF) is an uncommon disorder frequently accompanied by lumbar disc herniation (LDH)
- Typically found in adolescents and young adults, especially in young active athletes
- It is characterized by separation of osseous fragment at the posterior cephalad or caudad edge of the adjacent vertebral body, where fusion between ring apophysis and the adjacent vertebral body does not complete fully prior to the age of approximately 18–25 years

- The incidence of PRAF varies greatly at different ages. It was reported that patients with PRAF constitute 5.35–8.2 % among all ages of patients with LDH. In children and adolescents, the frequency was reported variantly ranging from 5.8 to 28 %.
- Due to its rarity, there is lack of an agreed treatment strategy, and lots of different opinions exist, including the choice of decompressive modalities, whether removal of apophyseal fragments or/and disc material, and the necessity of additional spinal fusion
- The most used surgical options were posterior discectomy simultaneous excision of apophyseal fragments without spine fusion.

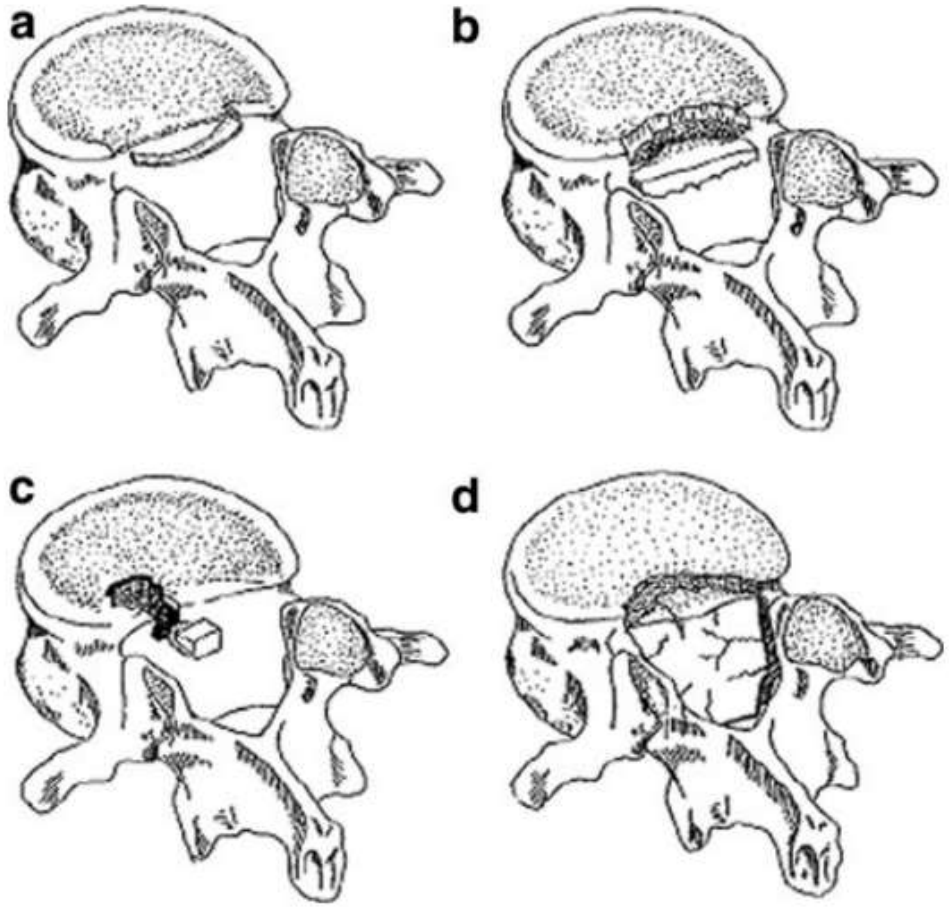


Fig. 4 Classification of PRAF. **a** Type I, an arcuate simple avulsion of the posterior cortex of the endplate without osseous defect. **b** Type II, an avulsion fracture of the central cortical and cancellous rim of posterior vertebra. **c** Type III, a more lateral localized fracture involving a larger amount of the vertebral body, resulting that osseous defect anterior to the fragment is larger than the fragment. **d** Type IV, a fracture spans full length of vertebral bodies between the endplates (schematic drawing was cited in Talha et al. [22], with reprint permission of Eur Spine J)

- The purpose of the operation is not only to relieve the neural decompression, but also to minimize the surgical trauma and avoid related complications to make them recover rapidly and return to school or other physical activities.
- Modalities of surgical treatment for PRAF consist of removal of disc or/and bony fragment via anterior or posterior approach with or without spinal fusion

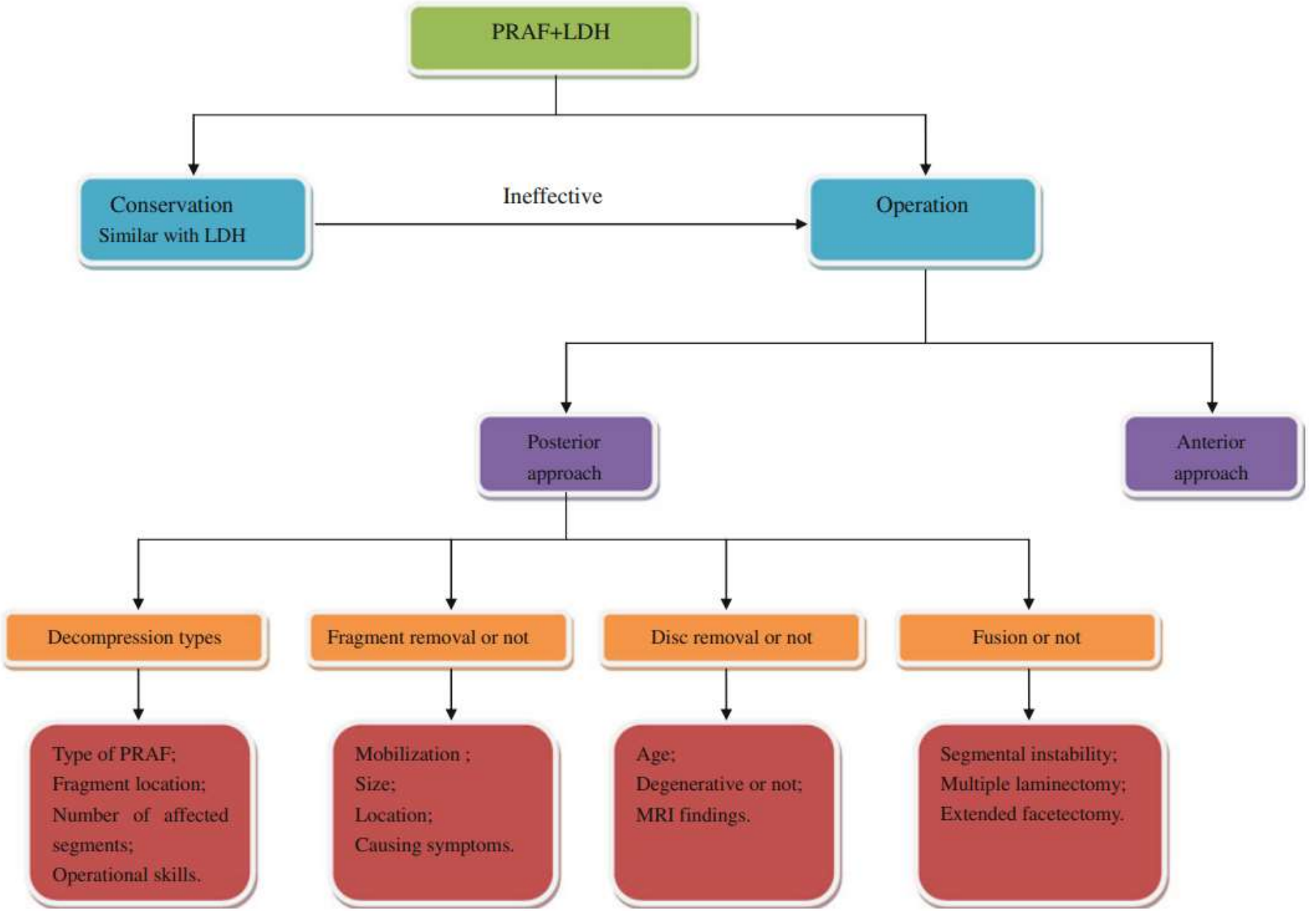
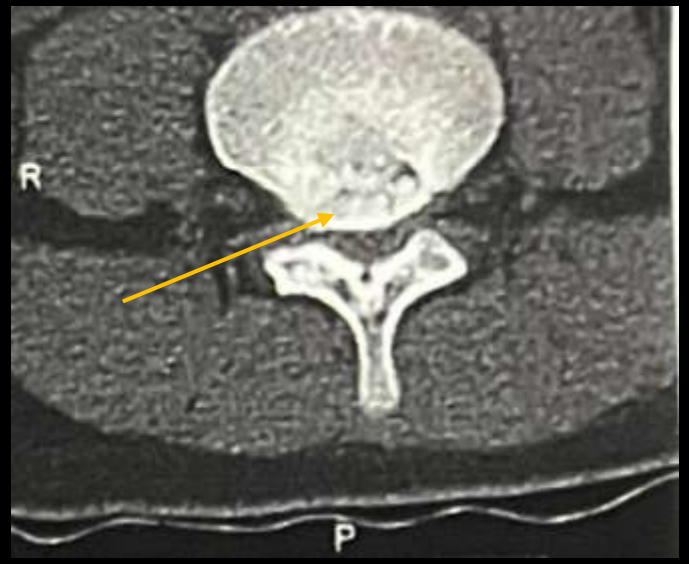


Fig. 5 Flow chart of the process to treat a patient with PRAF and LDH

CASE

- A13 year old girl with low back ache following alleged history of fall during a sports activity 3 months back.
- There is a neurogenic claudication of 200 meters. Patient was having tingling sensation over posterior aspect of bilateral lower limbs.
- On examination the straight leg raise test was positive at 50 degrees on right side and 60 degrees on left side. patient was not having any neuro deficit and there was no bowel and bladder incontinence.
- The Visual Analog Score (VAS) is 2/10 for back pain and 7/10 for leg pain. No significant improvement was seen with conservative treatment.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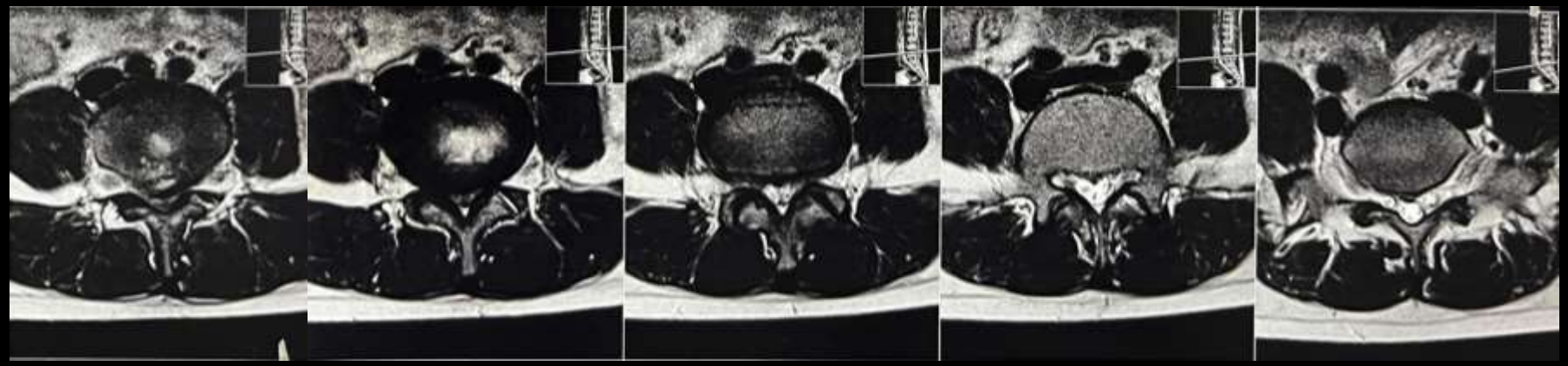
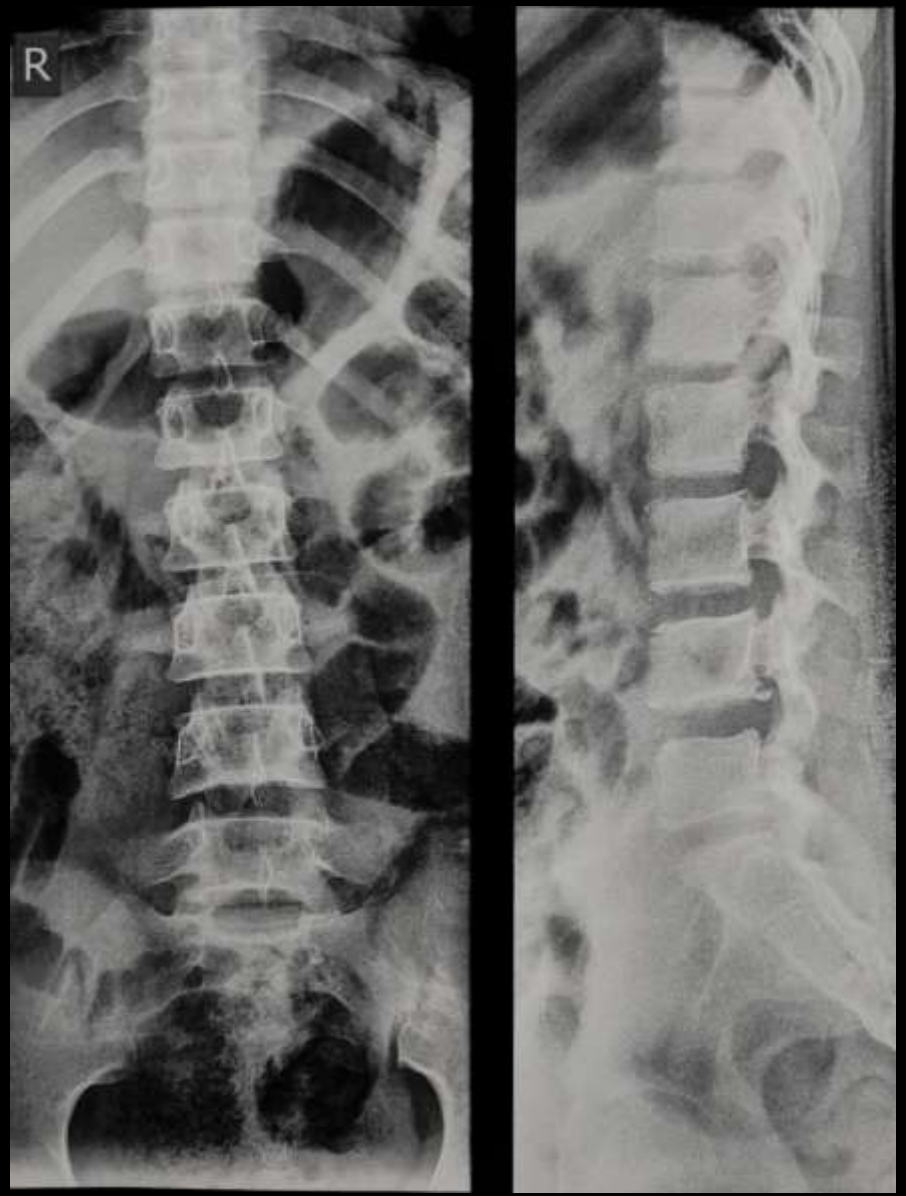
MRI



- MRI showing partial disc desiccation with diffuse disc bulge at L4-L5 level with mild ligamentum flavum hypertrophy, causing severe compromise of bilateral lateral recesses, with compression of bilateral L5 traversing and abutment of bilateral L4 exiting nerve roots due to mild compromise of bilateral neural foramina

UBE-ULBD

We performed unilateral laminectomy for bilateral decompression by unilateral biportal endoscopy (UBE-ULBD) at L4-L5 level from the right side of the patient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- Post operative the patient was comfortable and able to walk without claudication pain.
- The patient VAS of leg pain has improved post operatively to 3/10 immediate post operative and 1/10 at 1 month follow-up
- VAS of back pain was 2/10 immediate post operative and 0/10 at 1 month follow-up and the straight leg raise has improved to 80 degrees bilaterally

Take Home Points

- PRAF is a rare entity occurring in the age range of 10s to 50s or above
- CT is the best diagnostic performance for detection of bone fragments compared with plain radiograph and MRI.
- Surgical options are posterior discectomy simultaneous excision of apophyseal fragments without spine fusion, the surgeons should carefully consider these factors such as decompressive scope, removal of apophyseal fragment/disc or not and fusion or not
- UBE-ULBD is a an excellent choice for the PRAF condition