

# Prepubertal Presentation of Solitary Osteochondroma of Thoracic Spine – A Case Report

**S Hameed**, MS Orth, **AM Naik**, DNB Orth, **H Safderi**, MBBS, **SK Rao**, MS Orth

Department of Orthopaedic Surgery, Manipal University, Manipal, India

## ABSTRACT

An 11-year-old boy presented with an insidious onset, gradually progressive, painless swelling in upper back region that grew over the past 7 years. Spinal examination revealed a paraspinal globular mass on the left side at the level of the D1 to D4 vertebra. The swelling was bony hard in consistency, lobulated and fixed to underlying vertebra; there were no similar swellings on skeletal survey. Neurological and systemic examination was normal. Plain radiographs and computed tomography (CT) studies showed evidence of a lobulated, multiseptate, exophytic mass arising from the tip of the spinous process of D2 vertebra, with chondroid matrix calcification. Excision biopsy and resultant histopathological examination was suggestive of osteochondroma. Extant literature supports the origin of spinal osteochondroma from secondary ossification centres; thus, invariably, presentation of spinal exostosis occurs in the post-pubertal period. This case was unique in that the probable origin derived from a primary centre of ossification.

## Key Words:

*Solitary Osteochondroma, Spine, Ossification centre*

## INTRODUCTION

Osteochondroma is the most common benign bone tumour accounting for 36% to 41% of all such lesions and is found predominantly in appendicular skeleton, and rarely in spine<sup>1</sup>. Typical age of onset in most cases of spinal osteochondroma is post-pubertal, after the appearance of secondary ossification centres. We report here, a solitary osteochondroma arising from the neural arch of D2 in a patient that first appeared at the age of 4 years (although the patient reported to us at 11 years), well before the appearance of secondary centres of ossification. This study supports the origin of osteochondroma from primary centre of ossification as a possibility with such presentations.

## CASE REPORT

An 11-year-old boy, presented with insidious onset of a gradually progressive, painless swelling in upper back region that started 7 years prior to visiting our clinic. Examination

of the spine revealed a globular mass situated lateral to D1 to D4 vertebra from the left side to midline (Figure 1). Spinous processes of D2 and D3 were not palpable. The swelling was bony hard in consistency, lobulated, and appeared to be fixed to the underlying corresponding vertebra. The swelling became more prominent on forward bending and was not affected by chest movement, nor was there restriction of neck movements. Skin over the swelling was normal. There were no similar swellings in any other part of the body. The neurological and systemic examination was normal. Anteroposterior and lateral radiographs of the thoracic spine revealed a lobulated, expansile lesion showing irregular calcification within the tumour mass (Figure 2a). Plain CT study of the thoracic spine revealed a lobulated, multiseptate, exophytic cauliflower like lesion arising from the tip of the spinous process of the D2 vertebra, with chondroid matrix calcification (Figure 2b). There was no evidence of periosteal reaction and no cartilage cap was seen. Lamina, pedicles and transverse processes of C7 to D3 vertebra were normal as was the spinal canal.

Excision biopsy of the tumor was performed; intraoperatively, a globular, lobulated, hard mass measuring 5.5 × 4.5 × 4 centimetres, greyish white on the surface with all borders well defined and arising with a stalk from the D2 spinous process was seen (Figure 3). The mass was encapsulated and cut sections showed friable grey white tissue mixed with haemorrhagic areas. The postoperative course was uneventful.

Microscopically, this was a benign neoplasm composed of lobules of hyaline cartilage covered by a fibrous cap with overlying mature bony trabeculae. The interphase between cartilage and bone showed enchondral ossification and histopathological examination was suggestive of osteochondroma.

## DISCUSSION

Osteochondroma occurs due to focal herniation of the medial or lateral component of the epiphyseal plate, which results in the formation of an aberrant, cartilage capped eccentric small bone. These growths are typically found in bones where enchondral ossification occurs and rarely in bones that



Fig. 1: Tumour situated in left paraspinal area.

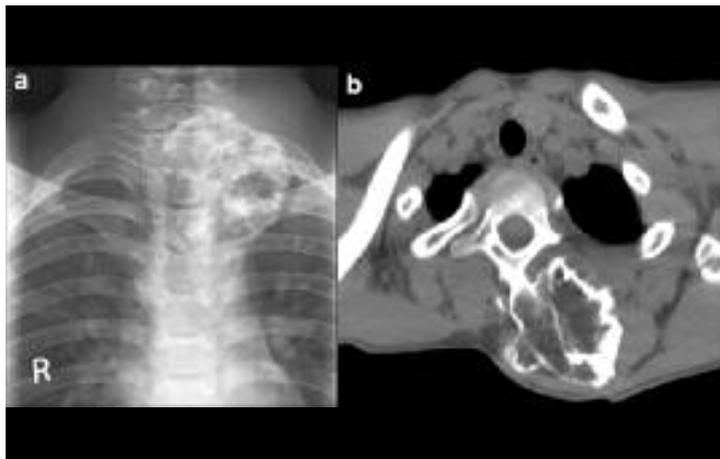


Fig. 2a & 2b: Radiograph showing expansile lesion with irregular calcification and axial CT showing the bony outgrowth from the spinous process of D2 vertebra.



Fig. 3: Intra-operative finding of a hard, globular, lobulated grayish-white mass arising from D2 spinous process.

develop through membrane ossification. Unlike the more extensive hereditary multiple exostosis (autosomal dominant), solitary osteochondroma do not appear genetically transmitted. Spinal involvement is very rare in solitary osteochondroma. Some authors report that spine is involved in less than 5% cases and that solitary spinal osteochondromas have 2.7% risk of malignant transformation and a 57% risk of spinal cord compression<sup>2,3</sup>. They can arise from any part of the vertebral column, but cervical spine is more commonly involved<sup>4</sup>.

Osteochondroma is frequently located in the upper region of the vertebral column; this property is possibly explained by varying durations of the ossification process in these centres<sup>5</sup>. Most reports<sup>2,4</sup> in the literature support the origin of

spinal osteochondroma from the secondary centre of ossification, which appears post pubertally (more than 12 years of age). There are no reports to suggest that the origin of spinal osteochondroma is from a primary ossification centre as reported in our case.

The costovertebral junction including the rib head is the most common origin, with 42% of solitary osteochondromas and 40% of hereditary exostosis respectively arising from this area. Intervertebral joint facets and pedicle involvement have also been reported.

On plain radiograph, an osteochondroma in a long bone typically appears as a pedunculated or sessile bone with projections. Spinal osteochondromas may be more difficult to detect on plain radiographs because of the complex image formation in the area of the spine. CT scan is the diagnostic imaging modality of choice as it shows the extent of osteocartilagenous and osseous involvement and its relationship to both vertebral and neural elements of the spine.

A case of osteochondroma of the thoracic spine is presented here in that is unique, that its probable origin was from a primary centre of ossification in contrary to most reported cases in which it arises from the secondary centre of ossification. As the growth period remaining is longer when such osteochondromas starts at an early age, the chances of progression in size, malignant transformation, and neural structure compression are higher in such cases. Recognition and identification of the natural history of this condition in the future should help to redefine the surgical indications for osteochondroma resulting in low complication rates such as malignant transformation and neurological deficit.

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