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Case Report

# A clinical study of a youngster with lung isolated pedunculated bone marrow.

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## Abstract

The purpose of this case report is to describe the unusual occurrence of a child's thoracic pedunculated osteochondroma, which originates from the fourth thoracic vertebra's lamina.

**Characteristics of the disease :** A 7-year-old girl was referred for a back swelling assessment. The patient has been experiencing painless, gradual, atraumatic back swelling for about two years. Physical examination revealed a healthy youngster with a well-defined mass around the midline of the upper thoracic spine, measuring around 46 cm. There were no discernible clinical indications of inherited multiple exostoses. Computerised tomography and plain radiography suggested the presence of a pedunculated osteochondroma originating from the fourth thoracic vertebra's lamina.

**Intervention and result :** The mass was surgically removed from the patient. The diagnosis was validated by the pathologist.

After two years of follow-up, there was no sign of a radiological or clinical recurrence.

**Conclusion :** This report details a unique instance of a solitary pedunculated osteochondroma in a child under 10 years old that arises from the lamina of the fourth thoracic vertebra and how it was managed.

**Keywords :** *benign tumors, hereditary multiple exostoses, spine column tumors, thoracic vertebra*

## INTRODUCTION

The most frequent benign bone and cartilage tumour is osteochondroma, which typically affects the distal femur, proximal tibia, and proximal humerus. It prefers to occur during the metaphysis of long bones.3. Osteochondromas account for 8%–9% of all bone tumours and around 35%–40% of all primary benign bone tumours.36 Many of these tumours have no symptoms and could go undetected. As a result, the incidence is most likely higher than stated.3,7 About 85% of cases of osteochondromas begin as single lesions. The remaining ones are a result of hereditary multiple exostoses (HME), an autosomal dominant condition marked by the development of several benign growths of bone covered in cartilage.1,8

Osteochondromas can develop from any zone of endochondral bone in the context of a dysplastic disease.4 The origin of these bony growths is believed to be a laterally displaced portion of the epiphyseal cartilage, which leads to dysplastic growth instead of gradual endochondral ossification.9.

Osteochondromas often start growing in early childhood and stop when the epiphyses close during puberty.10 10% of solitary osteochondromas and 1% of solitary osteochondromas may malignantly develop into chondrosarcoma. If the osteochondroma becomes painful, if it grows after skeletal growth stops, or if the thickness of the cartilaginous cap is more than 2 cm in adults or 3 cm in children, malignant transformation should be ruled out.1.12 The thickness of the cap can be measured with computerised tomography (CT), ultrasonography, or magnetic resonance imaging (MRI), although the most precise technique is MRI scanning.1, 6, 12

Lesions that are asymptomatic can be monitored without medical intervention, whereas those that are symptomatic require surgical excision.1. Pain, deformity, cosmesis, ongoing development, probable malignant change, and neurovascular impairment are among the indications for excision of a solitary osteochondroma.2, 3, 12, and 14 Osteochondromas come in two distinct forms: sessile and pedunculated. The slender pedicle of the pedunculated kind is oriented away from the growth plate. The broad based ones are sessile.

Just 1%–4% of all osteochondromas are single bone tumours

that start in the spine.3, 10, 15, and 18 Usually, they affect the cervical spine, namely the C1 and C2 vertebrae.10, 19, 20 The lumbar and thoracic spines are the next most commonly affected regions.

In this report, we present a single pedunculated osteochondroma that is asymptomatic. emerging in a 7-year-old child from the lamina of the fourth thoracic (T4) vertebra. While a sizable number of osteochondroma cases have been documented in the literature, very few cases involving spine osteochondromas have been described in patients under the age of ten. Since many of the reported instances did not specify the kind of osteochondroma, it was impossible to determine the precise number of osteochondromas in the pedunculated spine.

## Case Report

The orthopaedic clinic was consulted for the assessment of a painless swelling in the girl's back, age 7. The patient stated that the edoema had been there for around two years and was gradually getting worse. There was no past medical history of trauma, fever, or nocturnal agony. Her family was worried about her outward look, potential psychological impact, and sometimes back pain when she slept. A physical examination revealed a youngster in good condition with a well-defined mass at the upper thoracic spine area, measuring 4 - 6 cm around the midline. There were no indications of a spinal deformity, and the mass was fixed, bone firm, nontender, deep to the skin and fascia, and nonadhered to the skin. There were no other palpable lumps, and there was no clinical indication of HME.

The entire neurovascular assessment and the remainder of the physical examination were both normal. In addition to zones of endochondral mineralization in the marrow underneath the osteochondroma, plain radiographs and a CT scan (Figures 2 and 3) revealed a protrusion of cortical and medullary bone relative to the cortical bone of the spinous process of the T4 vertebra. The bone marrow of the nearby bone was in close proximity to the medullary section of the pedunculated osteochondroma. Following a discussion with the parents regarding the available treatment choices, surgical excision was selected, and informed consent was acquired.

A posterior midline incision was used to approach the tumour, which was then entirely excised (en bloc excision), including the cartilaginous cap, without causing any damage to the T4 vertebra's lamina or spinous process. the lamina, interspinous ligament, spinous process, or supraspinous ligament.

Pathologically, as shown in Figure 4, the lesion was composed of several irregularly shaped dome-shaped structures with a vague capsule and a hyaline cartilage cap measuring 3 mm that was continuous with bony trabeculae. The cartilage cap features were consistent with osteochondroma, and the bony stalk contained elements of normal marrow. A two-year follow-up revealed no evidence of a radiological or clinical recurrence.

## Discussion

Osteochondromas primarily affect the long bones; it is uncommon for them to originate in the vertebral column (1%–4% of cases),4,21, 22. With or without protrusion into the spinal canal, the most common location of vertebral osteochondromas is in an eccentric position inside the neural arch.23 It is rare for an osteochondroma to extend intraspinally. As a result, affected individuals hardly ever exhibit neurological symptoms.24 Depending on the size of the lesion, a decompression laminectomy or hemilaminectomy is the most common surgical treatment for spinal column osteochondromas, which typically originate dorsally or dorasolaterally.25

Development in tandem with HME is more typical and has been covered in detail in earlier articles.21, 26, and 28 For a single osteochondroma, the typical age of clinical manifestation, encompassing all spinal levels, is approximately 30 years and HME for twenty years.28 It is still unclear what causes solitary osteochondroma and HME pathogenesis. Despite making up 40% of the vertebrae, the thoracic spine was the location of only 26%–28% of all spinal osteochondromas in the reviews of osteochondroma published by Albrecht et al.10 and Roblot et al.11. Clinical symptoms associated with osteochondromas typically appear during growing in the second or third decade of life. Roblot et al. reported four occurrences of spinal solitary osteochondroma in children under the age of ten, all of which were in the cervical spine and all of which were in males. They also reported one case of HME in children under the age of ten, which was also in the cervical spine. Brastianos et al.'s review articles on isolated thoracic osteochondromasOnly one case under the age of ten was recorded by Roblot et al. and Khosla et al. It was inextricably linked to the lamina (presumably sessile).2, 11, 19, These articles did not specify the type of osteochondroma. One case of a massive cervical pedunculated osteochondroma of the cervical spine in an 8-year-old child with HME was reported by Rao and Jakheria.29

The tumour in this case, which affected a 7-year-old child,

originated from the posterior part of the T4 vertebra. This makes it an unusual case. The patient's psychological state was enhanced and her symptoms were fully resolved through surgery without compromising the spine's essential anatomical integrity.

## Conclusion

In summary, distinguishing between a sessile and pedunculate osteochondroma in the spine is crucial due to the sessile type's inseparability, the need for partial lamina and spinous process removal for full tumour excision, and the increased risk of neurological complications. The posterior spinal element is not harmed in the separable and en bloc excision of the pedunculated kind.

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