

Pedunculated Exostosis of the Pedicle of Lumbar Vertebra: A Rare Cause of Lumbar Pain and Swelling

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Learning Point of the Article:

Spinal osteochondroma, though an uncommon entity, should be considered in the differential diagnosis of chronic lumbar pain and swelling in young patients, as it can lead to pain, cosmetic deformity, fractures, or neurological complications, with surgical excision being the definitive treatment to alleviate symptoms, prevent recurrence, and mitigate the risk of malignant transformation.

Abstract

Introduction: Osteochondroma is a common benign bone tumor, but its occurrence in the spine is rare, particularly in the lumbar region. Among spinal osteochondromas, involvement of the pedicle is uncommon. This case highlights a rare presentation of a pedunculated exostosis arising from the right pedicle of the first lumbar vertebra (L1) with a fracture at its base, leading to persistent lumbar pain and swelling. Given its potential for neurological compromise and malignant transformation, timely recognition and surgical intervention are crucial.

Case Report: A 19-year-old male presented with a progressively painful swelling in the lumbar region for 5 years. He had no history of trauma or systemic illness. Examination revealed tenderness over the right paraspinal area of the upper lumbar region with a palpable bony mass. Magnetic resonance imaging showed a pedunculated bony lesion arising from the right pedicle of L1, projecting postero-superiorly, with a fracture at its base. The patient underwent surgical excision through a posterior approach. Histopathology confirmed the diagnosis of osteochondroma. Postoperatively, the patient experienced significant symptom relief, with no recurrence on regular follow-ups.

Conclusion: This case underscores the importance of considering spinal osteochondroma in young patients with chronic lumbar pain and swelling. Although rare, spinal osteochondromas can lead to fractures, neurological compression, and potential malignant transformation, surgical excision provides definitive treatment, relieving symptoms and preventing complications. Reporting such cases enhances awareness and guides timely diagnosis and management.

Keywords: Osteochondroma, fracture, spine, pedicle, exostosis.

Introduction

Osteochondroma (osseocartilaginous exostosis) is the most common benign bone tumor. Considered more like a hamartoma than a tumor, it accounts for 45% of benign bone tumors and 12% of all bone tumors [1]. Most often found in long bones, reports suggest osteochondroma of the spine to be relatively rare, accounting for only 4% to 7% of primary benign

spinal tumors and <3% of all osteochondromas [2]. Spinal osteochondromas are classified into two types: Multiple osteochondromas or multiple hereditary exostosis and solitary osteochondroma or solitary exostosis [3]. Spine involvement usually requires advanced imaging for diagnosis like magnetic resonance imaging (MRI) [4]. They are most commonly found in the posterior elements of the spine, and intra-spinal extension

Author's Photo Gallery



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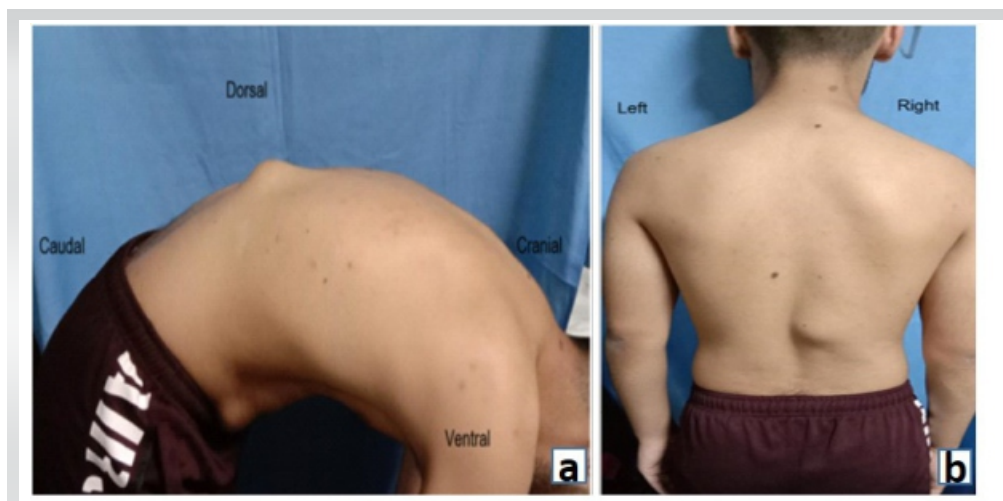


Figure 1: (a and b) Mass in the right paraspinal region in the upper lumbar area approximately 4×3.5 cm, hard in consistency and no pulsation. Skin over the mass was normal and the mass was separate from the skin.

is uncommon [5]. When the tumor causes pain, cosmetic deformity and/or neurological complications or when the diagnosis is unclear, it should be excised surgically [6]. In this paper, we present a 19-year-old male with a pedunculated exostosis arising from the right pedicle of 1st lumbar vertebral body (L1) with a fracture at the base, as a rare cause of lumbar pain and swelling.

Case Report

A 19-year-old male with no comorbidities presented with a progressive painful swelling in the lumbar region for 5 years with cosmetic complains as his primary concern. There were no recorded neurological and constitutional symptoms. Therefore, in spite of the above complaints, there was no limitation of daily activities. On examination, there was tenderness over the right paraspinal region in the upper lumbar area with a fixed palpable mass of size approximately 4×3.5 cm, hard in consistency and no pulsation. Skin over the mass was normal and the mass was separate from the skin. There was no restriction in flexion-extension and rotational trunk movements (Fig. 1a and b). Neurological examination was normal. Computed tomography (CT) scan showed a pedunculated bony outgrowth arising from the right pedicle of L1 vertebral body projecting postero-superiorly, with a fracture at the base (Fig. 2a, b and c). MRI done also showed similar findings and an overlying cartilaginous cap of 2.3 mm thickness. The bony central spinal canal

dimensions were normal with no evidence of primary canal stenosis (Fig. 3a and b). Under general anesthesia, an excision biopsy of the tumor mass was done through a posterior approach. Histopathological examination of the specimen as showed in Fig. 4. Postoperatively, the patient was symptomatically better, and on subsequent follow-ups did not show any recurrence or pain.

Discussion

Osteochondromas are the most common benign bone tumors, accounting for 35–40% of such cases, typically affecting the appendicular skeleton and long bones, with spinal involvement being rare (3–4% in solitary cases, ~9% in hereditary multiple exostosis) [7, 8]. The tumor affects mainly cervical and dorsal spine, possibly related to different durations of ossification that occur in secondary centers of ossification. It is speculated that more rapidly the ossification of these centers takes place, greater is the probability that aberrant cartilage will develop. In adolescence, secondary ossification centers which lie in the endplate of vertebral body, spinous process, transverse process, and articular process, complete the growth of vertebral column. These ossification centers appear in children between ages of 11 and 18 years. They develop into complete ossification in the cervical spine during adolescence and in the thoracic and lumbar spine at the end of second decade of life [9, 10].

Osteochondromas have gender predilection and have been

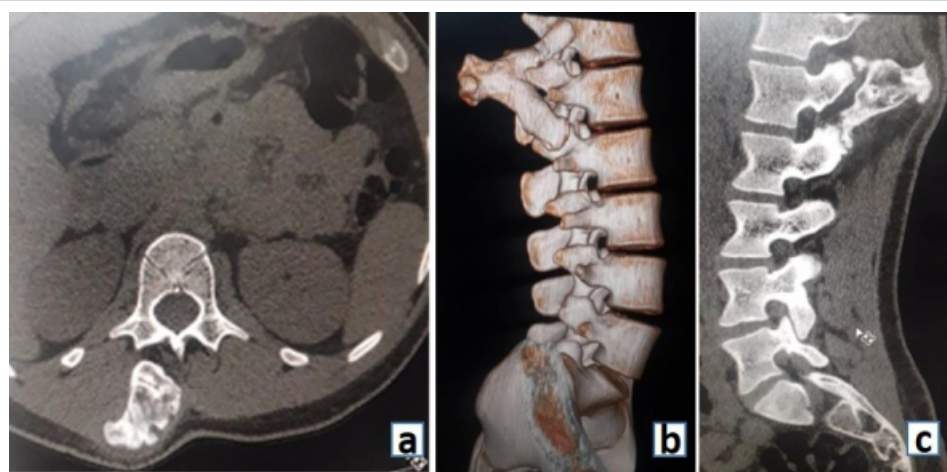


Figure 2: (a, b and c) Computed tomography scan images as described.

Table 1: Summary of reported cases of lumbar spine osteochondroma from 2015 onwards, including patient demographics, clinical presentation, affected vertebral level, specific part of the vertebra involved, and year of publication. This compilation highlights the anatomical variability and symptomatology associated with lumbar osteochondromas

Authors	Cases	Osteochondroma lumbar spine level	Part of the spine involved	Years
Shigekiyo et al., [19]	2 cases 61-year-old male with 2-year history of right leg numbness. 62-year-old male with pain and numbness in right leg.	L4 L5	Right inferior articular process Right superior articular process	2019
Sade et al., [20]	1 case 15-year-old female suffering from low back pain. No neurological deficit	L4	Spinous process	2017
Hadhri et al., [11]	1 case 20-year-old male with a solid painless mass over lower lumbar region. No neurological deficit	L3	Spinous process	2016
Rosa et al., [14]	1 case 70-year-old male presented with progressive and disabling lower lumbar pain. No neurological deficit.	L5	Spinous process	2016
Rymarczuk et al., [12]	1 case 40-year-old male with low back pain. No neurological deficit	L5	Vertebral body, extending into the retroperitoneum	2015
Sade et al., [21]	1 case 24-year-old female with low back pain. No neurological deficit	L4	Right arch spinous process	2015
Garcia-Ramos et al., [22]	1 case 21 year male with low back pain. No neurological deficit. (other case arising from the right lateral side of C1, extending to C2, and spinous process of C5) 7 C7)	L2,L3,L4	Spinous process	2015

reported more in males (64%). Most common level of origin was 4th lumbar vertebra (38%). Most common anatomic site of origin was the inferior articular process (1/3rd) [11]. A review of English language literature has returned 44 cases of lumbar osteochondroma till 2015 including the article by Rymarczuk et

al [12]. Cases reported in and after 2015 are illustrated in Table 1.

Osteochondroma can cause pain by applying pressure on adjacent soft tissues when it grows posteriorly (with fracture also causing pain as well, as in our case). Asymptomatic lesions

can be followed conservatively, but surgery can be considered whenever the diagnosis is not definite, or severe pain or in progressive neurological deficit [6], like foot-drop [13]. These lesions have both marrow and cortical continuity with the underlying bone and this is better seen on CT scan. MRI can be used to determine the extent of compromise of the underlying neurologic structures and to identify any suspicious malignant transformation [14, 15]. Moreover, this is the most concerning complication of osteochondromas, fortunately a rare complication [16]. The most



Figure 3: (a and b) Magnetic resonance images as described.

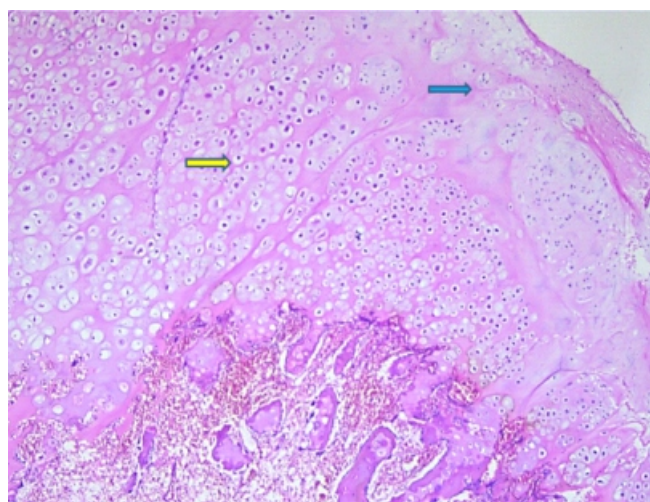


Figure 4: Microphotograph showing cartilaginous cap with fibrous perichondrium (blue arrow) and endochondral ossification (yellow arrow) (x40).

consistent finding that suggests malignant transformation may be a cap thickness >2 cm, but the diagnosis is only confirmed with a lesional biopsy [17]. Given the risk of malignant transformation, Gille et al., recommend surgical resection of all solitary spinal osteochondromas. In the majority of cases, the resection can be done without spinal instrumentation

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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because it rarely compromises spinal stability, as osteochondromas show focal growth in posterior elements [18].

Conclusion

We report a rare case of lumbar osteochondroma arising from the right pedicle of L1 vertebral body with fracture at the base. Osteochondroma even though rarely involves the spine, most commonly involves the cervical and dorsal vertebrae with fewer cases in the lumbar spine. The patient was symptomatic due to fracture at the base of the tumor and pressure over the posterior structures. Diagnosis can be made using CT scan and MRI. Surgical resection and biopsy is the treatment of choice if the mass is symptomatic. Malignant transformation is the most dreaded complication but is rare.

Clinical Message

Spinal osteochondroma, though rare, should be considered in young patients with chronic lumbar pain and swelling, as it can lead to fractures, neurological complications, or malignant transformation, with surgical excision being the definitive treatment for symptom relief and prevention of recurrence.

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