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Case Report

# Dangerous Location of Osteochondroma: A Case Report

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## Abstract

This report is of a 20-year-old woman with an osteochondroma of the proximal fibula with scalloping of tibia who presented with chronic pain and swelling in the right popliteal fossa that had been present from 3 years. Magnetic resonance imaging findings can't enable accurate diagnosis because of the similarities between osteochondroma and low-grade chondrosarcoma. Thus, biopsy of this tumor was necessary. Extemporaneous Histopathological examination confirmed the benign nature of osteochondroma, thus, we performed debulking of the tumour with complete excision.

## Introduction

Osteochondromas are the most common benign bone tumors accounting for 40% of all them, and 10% of all primary skeletal tumors [1]. According to the new World Health Organization Classification of tumors, this condition is a cartilage capped bony projection arising on the external surface of bone [2]. There are two types of osteochondroma: solitary osteochondroma, and Multiple Hereditary Exostoses (MHE). They generally affect the extremities of the long bones in an immature skeleton. Although benign, osteochondroma may represent serious threat like malignant transformation [3], and impingements of contiguous blood vessels or nerves [4]. In the following text, we present a case of osteochondroma of the head of the fibula, with two main concerns: the dangerous location with suspicion of a malignant transformation.

## Observation

A 20-year-old woman, presented to our department with chronic pain and swelling in the right popliteal fossa. Her symptoms had begun 3 years ago, with no history of trauma. Initially the patient complained an intermittent pain, which was well managed by basic treatment, but more recently, she reports a continuous dull ache. In addition, the patient noticed a swelling small in size, which later progressed over a period of two years, and limited range of motion in his right knee.

Physical examination revealed a firm bony mass arising from the posterior aspect of the proximal fibula on the right side. Also, it has objective restriction of flexion (90°), with a slight muscle atrophy of the right quadriceps. Otherwise, there was no neurovascular deficit. Laboratory data were normal.

Plain X-ray AP and lateral view of right knee revealed a large cauliflower involving the metaphysis of the proximal fibula, with scalloping of tibia (Figure 1). MRI right leg was done, which clearly showed a large mass arising from proximal fibula, with involvement of proximal tibia, measuring 80×37×41 mm, with a cartilaginous rim 20 mm thick. In addition, the tibio-fibular trunk was displaced, and the surrounding muscles were not involved (Figure 2).

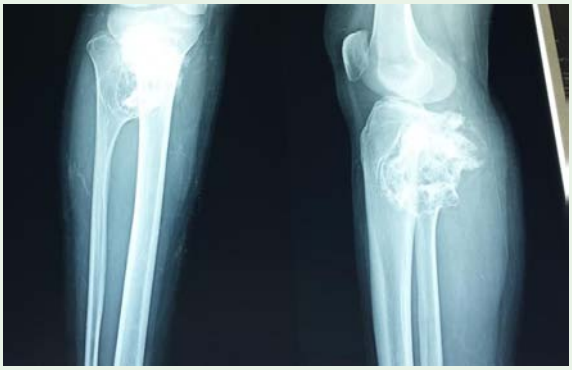

**Figure 1:** Plain radiograph AP and Lateral view of leg with knee showing large cauliflower like growth arising from proximal fibula along with scalloping of tibia.

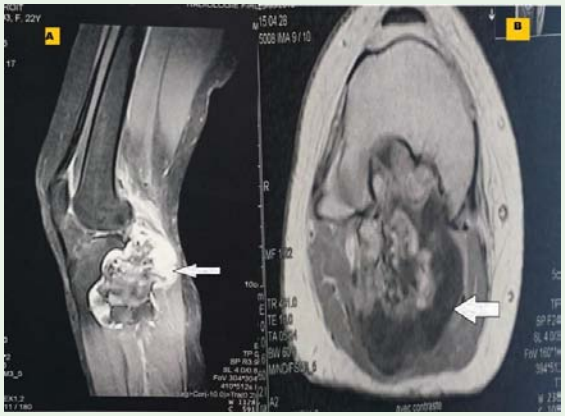

**Figure 2:** Sagittal (A) and axial (B) MR images showing the lesion with a cartilaginous rim 20mm thick.

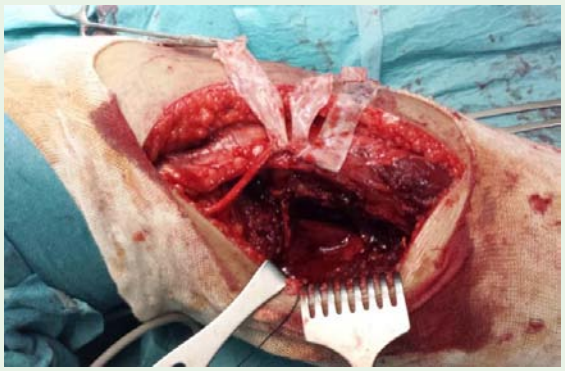

**Figure 3:** Right knee lateral approach. The common peroneal nerve was recognized and traced to its bifurcation and the tumors were resected.

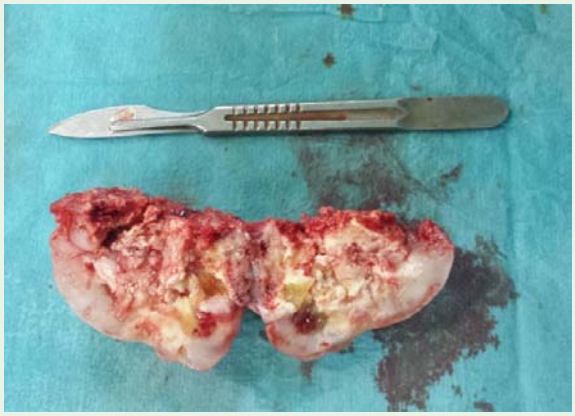

**Figure 4:** Photograph of the resected tumor in 2 pieces.

Although the low signal intensity of the cortical bone of the exostosis was presented in all sequences, consistent with the pathognomonic appearance of osteochondroma, the increased thickness of the cartilage cover, could not ruled out a chondrosarcoma. Thus, it was decided to obtain histological diagnosis by excisional biopsy.

The patient was admitted in operating room. She was positioned in the left lateral decubitis position after a spinal anesthetic. A tourniquet was applied on the proximal right thigh inflated to 350mm hg during 60min. A longitudinal lateral incision centered about the fibular head was made. The common peroneal nerve was then carefully dissected. After identifying the posterior neurovascular bundle, the mass was successfully excised without fibula osteotomy (Figure 3).

The specimen (Figure 4) was sent to pathology for histopathologic examination. Microscopy showed typical appearance of a benign osteochondroma with three layers: Perichondrium (most external), cartilage (intermediate) and bone (most internal). Thus, the final histologic diagnosis was osteochondroma.

The patient was seen in follow-up 2 weeks later for routine evaluation. She had an intact wound with minimal hand pain. At her 6-week postoperative mark, she had a pain-free and full knee range of motion. 2 years later, no evidence of recurrence was noted.

## Discussion

Firstly described by Sir Astley Cooper in 1818, osteochondromas is the largest group of benign bone tumors, which are composed of spongy bone covered by a cartilaginous cap [5]. This tumor is usually present in patients at the third to fourth decades of life with no effective predilection according to sex.

The cause of osteochondroma remains unknown. Many theories have been proposed to explain the etiology of osteochondroma, all of them relating to alterations to the growth plate [6].

Although, the vast majority of solitary osteochondroma are asymptomatic; Pain of greater intensity may be present, associated with complications including osseous and cosmetic deformities, malignant transformation [3], and, impingement on adjacent structures such as tendons, nerves, or vessels [4].

Regarding the treatment, all auteurs recommended abstaining for asymptomatic masses, with regular return visits because of the chance of malignant transformation. However, exostosis resection is required when the tumor causes pain, neurovascular compression, or joint limited motion. A wide variety of surgical techniques have been described to manage those tumors. They varied from simple debulking to complete excision of proximal fibula [7].

The purpose of this article was to present a case of osteochondroma of the head of fibula with two challenges in the managing of patient. The main concern was to identify the histological nature of this tumor, because the MRI findings were uncertain. The second one was the abnormal location of the mass with involvement of neurovascular bundle posterior to the knee.

The major risk of osteochondroma resection is missing a chondrosarcoma because failure to recognize their lethal potential can delay appropriate treatment and jeopardize the ultimate outcome. Geimaerdt et al. and Murphey et al. [8,9] concluded that Pain, a proximal location or a location on the axial skeleton, size being greater than 5cm, a lobulated aspect, an ill-defined margin, endosteal erosion and bone destruction with thickness of more than 2cm of the extra-osseous all suggest a malignant lesion. In our case, the tumor was located proximally of fibula, caused scalloping of tibia, with tibio-fibular trunk displacement but without cortical destruction,

or pathological fracture, however the cortical thickening was 20mm. Thus the diagnosis of osteochondroma was uncertain.

After discussing the case with radiologists, we recommended surgical excision of the mass. The goals of surgery involved identification and excision of the mass and decompression of neurovascular bundle.

The present case, illustrate the difficulty in distinctions between osteochondroma and chondrosarcoma for radiologists, pathologists and clinicians, alike.

## Conclusion

Although osteochondroma is the most common benign bone tumors; the differentiation of this tumor from low-grade chondrosarcoma is one of the most challenging and difficult diagnoses in bone sarcoma-imaging and pathology alike.

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