

Proximal Tibial Osteochondroma Leading to Chronic Compartment Syndrome

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ABSTRACT

Osteochondroma is the most common benign tumour of bone seen in 3% of the general population. Complications such as neurological compromise, skeletal defects, vascular lesions, and compartment syndrome occur in about 4% of osteochondromas. We bring forth the case of a 16-year male who presented with the complaints of swelling in calf region associated with symptoms of claudication and paraesthesias in leg after exertion and absence of any such complaints at rest. Radiographs revealed a bony pedunculated mass originating from the posterior tibial metaphyseal region causing compression of posterior soft tissue structures. Excision biopsy of the mass was done by posterior approach with an L-shaped incision. The aim of this case report was to draw attention to the early signs of vascular compromise by osteochondroma in this region in order to prevent serious complications in future by early decompression.

Key Words: Osteochondroma. Compartment syndrome. Claudication. Vascular compromise.

INTRODUCTION

Osteochondroma is the most common benign tumour of bone seen in 3% of the general population.¹ They probably are developmental malformations rather than true neoplasms and are thought to originate within the periosteum as small cartilaginous nodules.² Most lesions are found during the period of rapid skeletal growth. The tumor presents as a locally benign neoplasm, which favours the meta-epiphyseal region of long bones like the distal femur, as well as the proximal tibia and humerus.³⁻⁵ Complications such as neurological compromise, skeletal defects, vascular lesions and compartment syndrome occur in about 4% of osteo-chondromas.⁶⁻¹⁰

CASE REPORT

A 16-year male, construction worker by profession, presented to outpatient department of our tertiary care centre with chief complaint of swelling in the left calf region, which increased significantly after running and eventually leading to paraesthesia and calf claudication. Swelling was the consistent symptom, but paraesthesias and claudication were absent at rest. There was also some restrictions of terminal range knee flexion. There was no associated family history or trauma related to swelling. Swelling was progressively increasing in nature with no superficial skin changes and was causing these symptoms since last one year. On examination, a bony hard, nonpulsatile mass was palpable in the posterior calf region measuring 6 x 4 cm with fixity to the underlying bone. Distal pulses were well palpable with no sensory or motor deficit in the limb at rest.

Plain radiograph of left knee with leg demonstrated a solitary pedunculated mass arising from the posterior aspect of proximal tibial metaphyseal region, with growing end away from the knee joint towards posteromedial calf region (Figure 1a). There was cortical as well as medullary canal continuity of the bony growth with tibia. The bony mass was found displacing the posterior soft tissue structures in distal popliteal fossa and proximal calf region. MRI was planned to know the relation of the bony mass with the neurovascular bundle, but was not done as patient was belonging to the poor socioeconomic status.

Diagnosis of solitary pedunculated osteochondroma leading to chronic compartment syndrome was made and the patient was planned for excision biopsy of the lesion under regional anaesthesia after preanaesthetic workup. Patient was laid in prone position after regional anaesthesia followed by preparation of popliteal fossa and calf region for surgery. An L-shaped incision was used to approach the distal popliteal fossa and tumor. After soft tissue dissection, medial head of gastrocnemius was lifted in the popliteal fossa and everted to lateral side which carried neurovascular structures along with it leading to good exposure of the tumor and its base (Figure 1b). Extraperiosteal resection of the tumor was done from its base for decompression of posterior compartment of the leg. The excised bony mass was sent for the histopathological evaluation (Figure 1c). Postoperatively, patient had intact neuro-vascular status.

Histopathology confirmed the diagnosis of osteochondroma. Postoperatively, patient was given a plaster back slab for two weeks. After 14 days, slab was removed and sutures were removed. The wound was healthy with no suture line redness or discharge. Postoperative radiograph demonstrated complete excision of the tumor and decompression of posterior compartment of leg (Figure 1d). Patient achieved full range of knee motion 3 weeks postoperatively with

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Figure 1a: Anteroposterior and lateral radiograph of knee with leg of a 16-year young male showing a pedunculated bony mass originating from the posterior tibial metaphysis with growing end away from the joint.



Figure 1b: Intraoperative photograph showing a posterior approach for excision of tumor by an L-shaped incision providing good exposure of base of tumor.



Figure 1c: Photograph of excised tumor mass from posterior tibial metaphysis.



Figure 1d: Postoperative anteroposterior and lateral radiograph of knee with leg showing complete excision of tumor with decompression of soft tissue.

physiotherapy. At the 2-month follow-up, the patient's paresthesias and claudication had resolved, although he noted some general fatigue and aching of his calf with prolonged exercise.

DISCUSSION

Osteochondroma is a benign tumor of bone and cartilage accounting for up to 50% of benign and 15% of all bone tumors.^{11,12} They can occur as solitary (in about 90% of cases) or multiple tumours (in about 10%). Multiple osteochondromata are 10 times more likely to degenerate into malignant chondrosarcomata than the solitary ones.⁶ The symptoms depend on the location and size of the bone tumour and its surrounding tissues. The compression of an osteochondroma on a nerve or plexus can produce sensory or motor defects.^{6,8,9}

Various complications of osteochondromas have been described in literature including pathological fracture of stalk, overlying bursitis, cosmetic or bony deformity, neurovascular deficit, compartment syndrome and malignant transformation.^{13,14} In this case, patient presented with features of claudication and paraesthesia with exercise, but no such complaints at rest, suggesting a diagnosis of osteochondroma leading to chronic compartment syndrome. Conversion of chronic to acute compartment syndrome is known to occur.¹⁴ This is an alarming message for the treating physician that such signs can be dangerous for the limb of the patient and

surgical excision with decompression should be performed as soon as possible. Symptoms like these are overlapping in case of vascular complications by osteochondroma.⁶⁻¹⁰ We report this case to bring forth the importance of identification of early warning signs of vascular compromise to prevent a major complication which may prove to be limb-threatening.

In conclusion, this case is a rare presentation of osteochondroma leading to chronic compartment syndrome. The timely diagnosis of this condition and surgery can prove to be limb-salvaging from the vascular complication in future.

Ethical and humane considerations: A written informed consent was taken from the patient for publication of this manuscript with images; and ethical clearance was taken from the local ethical committee.

REFERENCES

- Saglik Y, Altay M, Unai VS, Basari K, Yildiz Y. Manifestations and management of osteochondromas: a retrospective analysis of 382 patients. *Acta Orthop Belg* 2006; **72**:748-55.
- Resnick D, Kyriakos M, Greenway GD. Osteochondroma. In: Resnick D, editor. *Diagnosis of bone and joint disorders*. 3rd ed. Philadelphia: W.B. Saunders; 1995; p.3725-46.
- He XH. Analysis of 1355 cases of tumors and tumor-like lesions in the bone. *ZhonghuaZhong Liu ZaZhi* 1990; **12**:66-8.
- Saglik Y, Altay M, Unal VS, Basarir K, Yildiz Y. Manifestations and management of osteochondromas: a retrospective analysis of 382 patients. *ActaOrthop Belg* 2006; **72**:748-55.
- Baena-Ocampo LDC, Ramirez-Perez E, Linares-Gonzalez LM, Delgado-Chavez R. Epidemiology of bone tumors in Mexico City: retrospective clinicopathologic study of 566 patients at a referral institution. *Ann Diagn Pathol* 2009; **13**:16-21.
- Vasseur MA, Fabre O. Vascular complications of osteochondromas. *J VascSurg* 2000; **31**:532-8.
- Forbes TL, Mehta S, Pudupakkam S. Popliteal artery false aneurysm secondary to tibial osteochondroma. *Can J Surg* 2002; **45**:63-4.
- Perez-Burkhardt JL, GomezCastilla JC. Posttraumatic popliteal pseudoaneurysm from femoral osteochondroma: case report and review of the literature. *J VascSurg* 2003; **37**:669-71.
- Gerrand CH. False aneurysm and brachial plexus palsy complicating a proximal humeral exostosis. *J Hand Surg* 1997; **22**:413-5.
- Eschelmann DJ, Gardiner Jr GA, Deely DM. Osteochondroma: an unusual cause of vascular disease in young adults. *J VascInterv Radiol* 1995; **6**:605-13.
- Jones KB, Morcuende JA. Of hedgehogs and hereditary bone tumours: re-examination of the pathogenesis of osteochondromas. *Iowa Orthop J* 2003; **2013**:87-95.
- Murphy MD, Choi JJ, Kransdorf MJ. Imaging of osteochondroma: variants and complications with radiologic-pathologic correlation. *Radiographics* 2000; **2013**:1407-34.
- Wuisman PIJ, Jutte PC, Ozaki T. Secondary chondrosarcoma in osteochondromas: medullary extension in 15 of 45 cases. *Acta Orthop Scand* 1997; **68**:396-400.
- Tavares JO. Acute compartment syndrome in osteochondromatosis. *Orthopedics* 2004; **27**:775-6.

