

Osteochondroma of Tibial Tuberosity in Adolescent: A Case Report

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ABSTRACT

Although osteochondroma is the most common benign bone tumor around the knee, osteochondroma of the tibial tuberosity is a rare presentation. Association of osteochondroma with patellar instability is even more rare.

We report an atypical presentation of solitary osteochondroma. A thirteen years-old boy presented to the clinic with a painful large osteochondroma of the tibial tuberosity associated with patellar instability and ulceration of the skin. Imaging studies showed a large osteochondral growth from the tibial tuberosity growing towards the knee joint. Excision of the mass and medialization of the tibial tuberosity was done, and the patient recovered uneventfully. Instability of the patella in this case can be attributed to lateral position of the insertion of patellar tendon caused by the osteochondroma of the tibial tuberosity.

Keywords: Knee, Tibial tuberosity, Osteochondroma, Patellar instability

INTRODUCTION

Osteochondromas are the most common benign bone tumor, accounting for about 45% of all benign bone tumors, and characterized by a cartilaginous cap occurring mainly in the growing age¹. They usually involve the metaphysis of the long bones². They likely are developmental malformations rather than true neoplasms and are thought to originate within the periosteum as small physeal cartilaginous nodules^{3,4}. They occur around the growth plate, with 40% of the tumors occurring around the knee¹. They tend to grow away from the joints.

Osteochondromas may be solitary or multiple, the latter being associated with the autosomal dominant syndrome, hereditary multiple exostoses (HME). Solitary osteochondroma is more common in males than females (1.6-3.4 to 1). The incidence of HME is one tenth of the incidence of solitary exostosis^{5,6}. Complications associated with osteochondromas are more frequent with HME and include deformity (cosmetic and osseous), fracture, vascular compromise, neurologic sequelae, overlying bursa formation, and malignant transformation. Malignant transformation is seen in 1% of solitary osteochondromas and in 3%–5% of patients with HME.

Osteochondroma can either be sessile (flat) or stalk-like masses and appear in a juxta- epiphyseal location.

We report a case of atypical presentation of osteochondroma of tibial tuberosity with clinical symptoms of patellar instability and skin ulcer.

CASE REPORT

A thirteen years-old boy presented to the clinic with a horn-like painful swelling on the anterior aspect of the left knee for two years. The pain is mild and occurs with pressure on the knee during sitting position for prayers. The swelling is progressive in nature. Three months prior to presentation, the patient started to have pressure ulcer on the tip of the swelling with minimal amount of discharge.

There was a history of giving way of the knee joint. There were no associated constitutional symptoms. There was no history of trauma.

On examination there is a horn like, hard mass extending anteriorly from the tibial tuberosity towards the knee joint with an ulcer on the tip (Figure 1). There is redness around the ulcer with minimal amount of serous discharge. There is mild tenderness on the tip of the mass. The mass was hard and fixed to the underlying tibial tuberosity. The knee range of motion was normal. The patient was able to do straight leg raising actively. The knee was stable with intact medial and lateral collateral ligaments as well as anterior and posterior cruciate ligaments. The patellar apprehension test was positive.



Figure 1: The clinical pictures of the left knee showing the tibial tuberosity mass with ulceration of the skin

The X-ray and MRI showed the osteochondroma involving the tibial tuberosity and the growth plate of the proximal tibia (Figure 2). The patellar tendon is pushed to the lateral aspect of the base of the mass. Blood investigations including CBC and inflammatory markers were within normal.

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Figure 2: X-rays and MRI showing large osteochondroma of the tibial tuberosity with involvement of the growth plate of the proximal tibia and the lateral position of the patellar tendon

SURGICAL TECHNIQUE

Under general anesthesia, with tourniquet on the upper left thigh, a midline anterior knee incision was made. The ulcer and skin around it as well as the periosteum excised completely with the mass. The insertion of the patellar tendon was on the lateral aspect of the base of the mass (Figure 3). Trans-lesional excision of the mass was done leaving the attachment of patellar tendon with a flake of normal bone (Figure 4). The mass was excised from its base while preserving the anterior aspect of the growth plate. The remaining part of the tibial tuberosity with patellar tendon insertion was shifted back medially to and fixed with two screws from anterior to posterior. Lateral release of the patellar retinaculum was done as well. Histopathology confirmed the diagnosis of osteochondroma with no evidence of mitotic activities or malignant changes.



Figure 3: Intraoperative pictures showing the incision used to excise the mass



Figure 4: Intra-operative picture post excision of the mass. The artery is pointing to the laterally positioned patellar tendon insertion with remaining thin flake of bone

A cylindrical cast applied for four weeks followed by physiotherapy and rehabilitation. Postoperative recovery was uneventful. The patient returned to daily activities and regained full range of motion of the left knee three months after surgery.

Latest follow up, three years post excision, the patient was asymptomatic with no patellar instability and no clinical or radiographic indication of recurrence of the lesion.

DISCUSSION

Osteochondroma of the tibial tuberosity is rare and few cases had been reported in the literature⁶. Most of the reported cases described the mass as a small osteochondroma around the insertion area of the patellar tendon that mimics Osgood Schlatter disease (OSD). Balaji et al. reported a case of osteochondroma of the tibial tuberosity in a twelve-year-old boy. The mass size was 4x2 cm and mimicked OCD. The diagnosis of osteochondroma was confirmed with histopathologic evaluation. Jamshidi et al reported a series of benign tumors of the tibial tuberosity that mimic OSD⁷. Three of the cases were osteochondroma, four cases periosteal chondroma and one case dysplasia epiphysealis hemimelica. In the cases of osteochondroma, the mean size of the bump was 7.6 cm, and they were painless. They concluded that the character of the pain, the size of the mass larger than 5 square cm, and the patient age younger than 10 years could be considered as factors against OSD.

None of the reported cases presented as large mass with ulceration of the skin. MN Baig reported a case of osteochondroma of the 1st metatarsal bone in an old with formation of skin callosities but without ulceration⁸. To the best of our knowledge, no report in the literature of osteochondroma with ulceration of the skin.

Singh R. et al. reported a unique case of large extra-skeletal intra-articular osteochondroma of the knee joint in adult patient associated with mechanical symptoms of the knee joint⁹. The mass was not related to the tibial tuberosity. Javdan et al. reported a case of large, painful intra-articular osteochondroma that was extending from tibial tuberosity to the front of the knee joint⁶. To the best of our knowledge, none of the tibial tuberosity osteochondroma cases reported in the literature was associated with patellar mal-tracking and instability. Our reported case was symptomatic and extra-articular and attached to the tibial tuberosity.

In general, osteochondroma lesions usually grow away from the nearby joint and toward the diaphysis^{10,11}. The unique presentation of our case

is attributed to large size, horn-like mass protruding anteriorly and caudally from the tibial tuberosity, growing away from the diaphysis. It is also associated with ulceration of the skin at the tip of the horn. The ulcer could be due to pressure while sitting on the ground or due to repeated injuries to the tip of the mass. Less likely, it could be due to skin necrosis with rapid growth of the mass. Our presented unique case is also associated with giving way of the knee joint and abnormal movement of the patella. These symptoms could be due to lateral shift of patellar tendon insertion caused by the growth of the mass.

CONCLUSION

Osteochondroma of the tibial tuberosity is a rare presentation. If it is large enough and neglected, it can become symptomatic and cause patellar mal-tracking and skin ulceration.

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