Incarcerated pes anserinus around a proximal tibial osteochondroma: a rare extra-articular cause of locked knee

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Abstract

Introduction: Osteochondroma is the most common benign skeletal neoplasm and is found most often in long bones, especially in the distal femur and proximal tibia. They usually present as painless swelling near the joint and can be complicated by mechanical irritation, compression or injury of adjacent structures, fracture, malignant transformation, and post-operative recurrence. Locking of the knee refers to flexion of the knee without complete extension and passive extension is limited resulting in significant pain. Excision is a successful form of the treatment for symptomatic osteochondromas.

Case Report: A case of osteochondroma of the proximal tibia illustrates extra-articular cause of locked knee secondary to the incarceration of pes anserinus tendons by the lesion.

Conclusion: Surgical excision of the bilobed pedunculated posteromedial proximal tibia osteochondroma and restoration of the gracilis and semitendinosis to its normal anatomic position resulted in the complete resolution of symptoms.

Keywords: Osteochondroma, Locked knee, Pes anserinus.

Introduction

Osteochondroma is the most common benign skeletal neoplasm and is found most often in long bones, especially in the distal femur and proximal tibia, with 40% of the tumors occurring around the knee [1]. They usually present as painless swelling near the joint and can be complicated by mechanical irritation, compression or injury of adjacent structures, fracture, malignant transformation, and post-operative recurrence. Magnetic resonance imaging represents the most valuable imaging modality in symptomatic cases, because it can demonstrate typical features of associated soft-tissue pathology, which can be differentiated from malignant transformation [2]. Locking of the knee refers to flexion of the knee without complete extension. Passive extension is limited resulting in significant pain [3,4]. Excision is a successful form of the treatment for symptomatic osteochondromas with low morbidity [5]. This case describes a patient with a locked knee secondary to entrapment of pes anserinus by osteochondroma.

Case Report

An 18-year-old male presented to us with pain and swelling over medial aspect of the right knee for 1 year. Swelling gradually increased and was associated with an inability to extend the knee and the knee locked in a flexed position. There was no significant history in the past. On examination, a tender solitary swelling measuring 5.5 × 4.5 cm over medial aspect proximal tibia, hard in consistency, and fixed to the bone with no signs of malignancy (Fig. 1). There was no neurovascular deficit in the extremity. Forceful extension of the knee could not overcome the locked knee joint which resulted in significant pain over the medial proximal tibia. There were no joint line tenderness and clinical tests for meniscal and ligament injury were normal. Plain radiograph showed pedunculated bony outgrowth arising from posteromedial cortex of proximal tibia at the metaphysis with no joint effusion or soft-tissue calcifications (Fig. 2). Magnetic resonance imaging (MRI) of the right knee was done which was suggestive of bilobed pedunculated bony outgrowth measuring approximately 4.8

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Figure 1: Local examination.

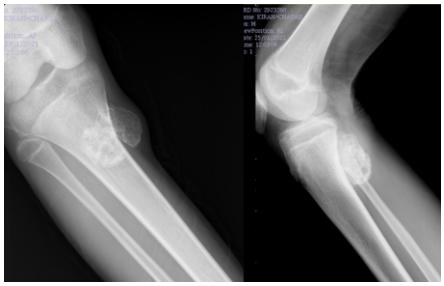

Figure 2: Pre-operative anterior posterior and lateral radiographs.

Figure 3: Medial approach to proximal tibia.

× 2.8 × 4.7 cm arising from the posteromedial cortex in the metaphyseal region of the tibia surrounded by a cartilaginous cap with a maximum thickness of 3.8 mm. Diagnosis of osteochondroma was made and excision of the lesion was planned. Under spinal anesthesia, the patient in supine position and limb was draped with all aseptic precautions without the use of a tourniquet. Using the medial approach to proximal tibia, skin incision starting from 2 cm proximal to the joint line at the medial epicondyle, extending distally bisecting the posteromedial border of the tibia and the tibial crest (Fig. 3). Pes anserinus tendons were seen entrapped in the bilobed pedunculated lesion and a bursa overlying it. Gracilis tendon and semitendinosis tendon were seen incarcerated below the lesion (Fig. 4). Both the tendons were isolated with Ryles tube and excision of osteochondroma was done and the entrapped tendons were freed. Gross examination revealed a bluish-gray bilobed mass with a bosselated and shiny surface measuring 5 × 3 × 4.5 cm (Fig. 5). Histopathological examination revealed a cap of mature hyaline cartilage with overlying fibrous perichondrium and mature bone with no evidence of atypia or necrosis, confirming the diagnosis of osteochondroma (Fig. 6). Normal movement of the knee was restored and confirmed. Post-operative radiograph confirmed the removal of the lesion (Fig. 7). Follow-up after 3 months patient had no pain or locking of the knee.

Discussion

Osteochondromas are common benign bone tumors due to developmental malformations that originate within the periosteum as small cartilaginous nodules. They are more predominant in males. They are due to progressive enchondral ossification of a growing cartilaginous cap usually found on the metaphysis of a long bone [6]. The most common symptom of an osteochondroma is a painless mass near the joints. The most frequent location is the distal femur [2]. Osteochondroma is either pedunculated with a narrow stalk or sessile with a broad base. It typically occurs at the site of tendon insertion. The underlying cortex is covered by a thin cap 2–3 mm thick in adults and may exceed 1–2 cm in a growing child [7]. After skeletal maturity, osteochondromas do not exhibit growth. Osteochondroma has a pathognomic radiographic appearance which is composed of cortical and medullary bone continuous and protruding from underlying bone. Pedunculated lesions usually point away from the nearest joint. The hyaline cartilage cap is variable in appearance on the radiograph and the thickness of the cartilage cap is usually not well evaluated with radiography unless there is extensive mineralization [8]. Ultrasound visualizes the cartilage layer which is seen as a hypoechoic area on the bone cortex and is useful for the study of complications such as aneurysms, thrombosis, or bursitis. In areas of complex anatomy such as osteochondroma of spine, shoulder, or pelvis, computed tomography scan shows excellent visualization of corticomedullary continuity of the lesion [9]. MRI is considered as the best modality to visualize the effect of the lesion on surrounding structures and evaluate hyaline cartilage cap. Cortical

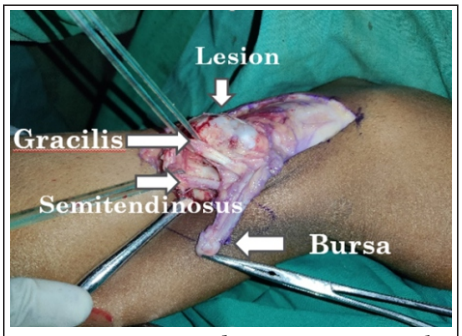

Figure 4: Entrapped pes anserinus in the lesion.

Figure 5: Bilobed osteochondroma.

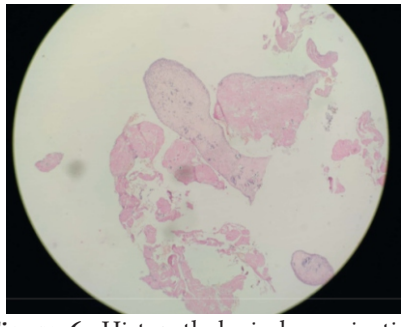

Figure 6: Histopathological examination confirming the diagnosis.

Figure 7: Post-operative anterior posterior and lateral X-rays.

continuity is shown as a hypointense line on all pulse sequences and the bone marrow maintains a yellow marrow signal. The non-mineralized portion of the cartilage cap has high water content which is displayed as low intensity on T1-weighted images and high intensity on T2-weighted images. Multiple hereditary exostoses are an autosomal dominant condition due to mutation of EXT1 and EXT2 genes.7 Malignant degeneration of osteochondroma is rare and the incidence is approximately 1% for patients with solitary osteochondroma and 5% for patients with multiple hereditary exostoses. Locking of the knee describes a knee that cannot be completely extended. It may be due to intra-articular mechanical block termed as "True locking" or due to functional irregularity causing hamstring muscle spasm known as "Pseudo-locking." The most common causes for true locking are meniscal tears followed by cruciate ligament injury and loose bodies [10]. Locked knee is rarely caused by synovial hemangiomas, giant cell tumors, gouty arthropathy, or intra-articular ganglion. Osteochondroma causes the soft tissue to glide over the lesion leading to chronic irritation, bursa formation, or tendon ruptures. Surgical resection is indicated when the lesion is large enough to cause symptoms from pressure on surrounding structures or when malignant degeneration occurs [6].

Conclusion

We report a case of osteochondroma of the proximal tibia which illustrates the extra-articular cause of locked knee secondary to the incarceration of pes anserinus tendons by the lesion. Surgical excision of the bilobed pedunculated posteromedial proximal tibia osteochondroma and restoration of gracilis and semitendinosis to normal anatomic position, the symptoms resolved. Differential diagnosis for the locked knee is broad but tendon incarceration should be considered in patients with osteochondroma with significant symptoms.

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

Conflict of Interest: NIL; **Source of Support:** NIL

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