International Journal of Research in Orthopaedics
Mahajan NP et al. Int J Res Orthop. 2023 Mar;9(2):435-438
http://www.ijoro.org

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20230477

Case Report

A case report on surgical excision of intracapsular osteochondroma of femur neck using medial approach without hip dislocation in a young male

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Received: 09 October 2022
Accepted: 10 November 2022

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ABSTRACT

Osteochondromas also called exostosis are commonest benign bone tumours. Traditionally Osteochondroma are considered as developmental malformations rather than true neoplasms and are thought to formed inside the periosteum due to separation of small epiphyseal growth plate cartilage. But recent studies suggested it's relation with mutation in gene exotoxin 1 so now they are considered as true neoplasm. The lesions consist of a bony mass produced by progressive endochondral ossification of a growing cartilaginous cap. Most lesions are found during the period of rapid skeletal growth. Approximately 90% of patients only have a single lesion. Osteochondromas generally found on the metaphysis of a long bone near the physis like distal femur, proximal humerus, and proximal tibia. Due to risk of AVN after surgical management makes it difficult for excision. Due to close proximity to important neurovascular bundles these lesions can cause symptoms related to compression. Hip impingement is also common in these cases. Recurrence of osteochondromas are rare sometimes seen due to failure to remove the entire cartilaginous cap. A 24-year-old male presented with complaints of pain around the right hip and difficulty in walking and running since 2 year. On radiographic examination Right sided neck femur osteochondroma was diagnosed, which was located along the anteroinferior margin of the femur neck. Excision of the lesion was done in supine position using medial approach to hip without dislocation of the femur head. Femur neck osteochondroma should be removed surgically safely without dislocating hip. Osteochondroma must be removed completely with cartilagenous cap to avoid recurrence.

Keywords: Osteochondroma, Proximal femur osteochondroma, Benign bone tumour, Femur neck osteochondroma

INTRODUCTION

Osteochondromas also called exostosis are commonest benign bone tumours. Traditionally Osteochondroma are considered as developmental malformations rather than true neoplasms and are thought to formed inside the periosteum due to separation of small epiphyseal growth plate cartilage.[1,2] The cause of osteochondromas remains unknown. Many hypotheses have been put forward, all of them relating to alterations to the growth plate. Exotosin gene mutation (EXTgene) autosomal dominant disorder considered to be causing solitary osteochondromas or hereditary multiple exostosis. As Incomplete penetration in females, males more affected than females (2:1).[3] Osteochondromas generally appear and grow in growth period. Growth cease seen once skeletal maturity occurs, so most common presentation is in 1st 3 decades. Commonly osteochondromas developed within metaphysis of long tubular bones and it is cartilage capped eccentric bony outgrowth commonly directed away from growing end. This bony outgrowth is having cortical and medullary portions which are continuous with cortical and medullary portion of main bone.[4] Associated

complications of osteochondromas are local bursitis, malignant transformation, nerve entrapment, fracture, muscle atrophy. Thickness of cartilage cap is usually less than 2 cm. Cartilage cap thickness more than 2 cm may be associated with higher risk of malignant transformation.[5] This cartilaginous cap is not visible on x rays. Recurrence of osteochondromas seen due to failure to remove entire cartilaginous cap. Rarely osteochondromas also seen in proximal femur. Along with common symptoms of osteochondroma in proximal femur it shows joint motion restriction, coxa Valga, hip dysplasia.[6]

Due to location of lesion, it is difficult to determine optimal treatment as high risk of avascular necrosis after surgical excision.[4] Here we report a rare case of an intra-articular osteochondroma involving the anteroinferior aspect of the femoral neck.

CASE REPORT

A 24-year-old male presented with complaints of pain around the right hip and difficulty in walking and running for 2 year. On examination of this patient terminal internal rotation and flexion was restricted. Radiological investigations done suggestive of the exophytic growth over the anteroinferior margin of the right neck of femur (Figure 1). This bony growth causing indentation on the capsule and breaching the capsule. Significant thinning of capsule was seen. This osseous growth was connected to the bone marrow of the metaphysis.

Figure 1: X-ray right femur of exophytic bony growth along the anteroinferior border of the right femur neck.

This patient was planned for surgical excision of the lesion without hip dislocation. Patient was taken in supine position on operative table. With hip in flexed, abducted and externally rotated. Around 15 cm incision taken on medial aspect of thigh from 2.5 cm distal to pubic tubercle to downwards over the interval between gracillis and adductor longus. Adductor longus and adductor Bravis is muscles retracted anteriorly and adductor Magnus and gracillis retracted posteriorly. Posterior branch of obturator nerve exposed and protected. Iliopsos tendon retracted laterally and reached to capsule. Lesion base was identified and separated from surrounding tissue. Lesion was removed using angled chisel (Figure 2). Using bone nibbler remnant part of lesion was nibbled out .by using absorbable sutures redundant capsule was closed. Wound closure done in layers. The excised specimen was sent for histopathological analysis and diagnosis of osteochondroma was confirmed. In post operative x ray was done, showing complete removal of the lesion (Figure 3) and patient mobilized immediately after the surgery. Patient is pain free and is able to perform all the daily activities currently.

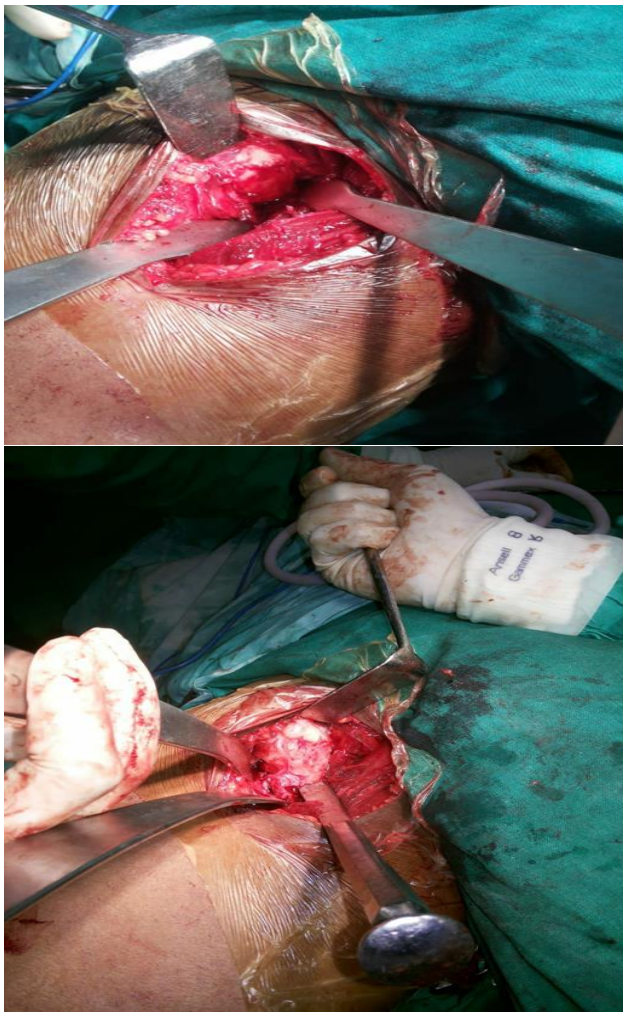

Figure 2: Intra-operative pictures showing the osteochondroma; it is covered with shiny white cartilage cap.

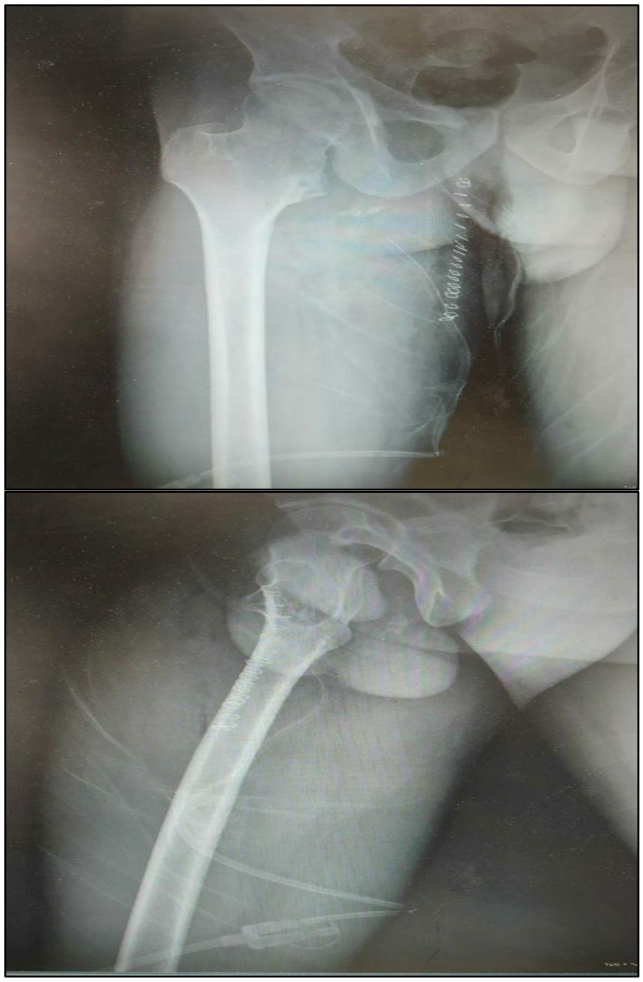

Figure 3: The post operative radiographs of right femur with complete removal of the lesion.

DISCUSSION

Osteochondromas Seen as solitary lesion or as a part of hereditary multiple exostosis. Generally found in rapid growing immature skeleton. However atypical presentation (axial skeleton) can be seen. Osteochondromas around the hip joint can cause growth disturbance, hip dysplasia, coxa valga, and hip joint subluxation.[6] The lesions on the medial side femur and around acetabulum may alter the hip's parameters and affect its development, results in acetabular dysplasia. The severity of the deformity at the proximal femur can be measured using the head/neck ratio. A decreased ratio suggests the presence of osteochondromas at the femoral neck causing broadening. growth of lesions at the medial femoral neck head is prevented from growing from the horizontal to more vertical direction which leads to coxa valga deformity.[6,10,11] these lesions can possibly cause labral tears, hip subluxation and dislocation, external snapping hip, acetabular dysplasia, neurovascular compression and rarely malignant transformation. Mechanical restriction to hip range of motion can be seen in femur neck osteochondromas. Mechanical blocking occurs through direct contact of the widened and enlarged femoral neck against the ischium or the acetabular rim or both, which may serve as a fulcrum with forced motion. This mechanism explains the clinical symptoms and may lead to damage of the labrum and the adjacent articular cartilage, leading to progressive osteoarthritis.[7]

A radiograph in both planes generally sufficient for making diagnosis of osteochondroma. It shows eccentric bony outgrowth from metaphysics of long bone with cortex and medulla continuous with underlying bone. The attachment may be pedunculated or sessile. The lesion consists of three layers outer periosteum, then cartilagenous cap and inside bone. Cross sectional imaging techniques such as CT and MRI helpful in further evaluation of lesion especially of cartilaginous cap.

MRI plays an important role in confirming the diagnosis and deciding prognosis. continuity of the cortex and medulla of the lesion with the native bone is the pathognomonic feature of osteochondroma. MRI helps in assessment of thickness of cartilagenous cap, medullary continuity and other complications like malignant transformations, nerve entrapment, pseudo aneurysm, muscle atrophy. The thickness of cartilage cap is usually less than 2 cm. A cartilage cap thickness more than 2 cm may be associated with higher risk of malignant transformation.[5,9]

Resection of osteochondroma of the femoral neck, which frequently involves the anterior, inferior, and posterior aspects of the femoral neck, poses difficulties in choosing an adequate surgical approach to reach the entire lesion. High chances of femoral head necrosis may see in approaches using hip dislocation as injury to medial circumflex femoral artery.[13]

Bottner et al reported a series to investigate the outcome of surgical excision of osteochondroma, 86 patients were treated by surgical management. In their series, 93.4% of preoperative symptoms resolved after surgical excision. Four patients had major complications including one intra-operative fracture of the femoral neck and three peroneal nerve palsies. Local recurrence was observed in 5.8% of cases. Incomplete excision of the lesion and young age at presentation were risk factors for local recurrence.[14]

Other modalities of treatment are arthroscopic excision, mainly for smaller size lesions and completely intraarticular location like acetabular osteochondromas and navigation assisted excision of the osteochondroma.15

CONCLUSION

A solitary, symptomatic osteochondroma of the femur neck must be treated surgically, with a complete pre-operative workup. Surgeons should always consider the possibility of intraoperative fracture or chances of damage to the vascular supply of head and post operative avascular necrosis of femur head. Depending on its implantation and extent, en bloc resection of the tumour may be performed

via a single wide surgical incision with special curved instruments, without dislocating the hip.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Mahajan NP, Gund A, Kondewar P, Chaudhari K, Bagimani P, Patel R. A case report on surgical excision of intracapsular osteochondroma of femur neck using medial approach without hip dislocation in a young male. Int J Res Orthop 2023;9:435-8.