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Case Report

Surgical excision of a solitary osteochondroma arising from the lesser trochanter in an adult: a case report

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ABSTRACT

The occurrence of osteochondroma around the proximal femur is rarely reported as most cases are asymptomatic. We report a rare case of symptomatic solitary osteochondroma arising from the lesser trochanter in a skeletally mature patient causing significant impairment of hip function managed by surgical excision. A 32-year-old male labourer presented with pain and swelling over right hip region for nine months. Radiographic examination (X-ray, MRI, CT) revealed the pathognomonic continuity of the cortex and medulla of the lesion with the parent bone. Cartilage cap cover (measuring 15 mm) on MRI helped to clinch the diagnosis. CT guided biopsy was also suggestive of osteochondroma. The tumour was excised en bloc by posterior approach without the need for hip dislocation. The base of the lesser trochanter was osteotomised and the entire mass with the cartilage cap was removed. A two year follow up has shown no evidence of local recurrence. Surgical excision of a symptomatic osteochondroma is a successful form of treatment with low mortality. Adequate pre-operative radiographic examination is helpful to know the location and local spread of the tumour. Measurement of cartilage cap thickness on MRI is an essential tool to diagnose malignant changes. A safe and adequate resection should be carried out in an effective manner with attention to femoral head vascularity and prevention of local recurrences. Patients with solitary osteochondroma around the proximal femur should be kept under observation to help early detection of malignant changes.

Keywords: Osteochondroma, Exostosis, Proximal femur, Lesser trochanter

INTRODUCTION

Osteochondromas are benign osteocartilaginous primary bone tumours and account for more than one third of primary benign bone tumours[1]. According to World Health Organisation (WHO), they are defined as bone projections enveloped by a cartilage cover that arise on the external surface of bone[2]. There exists a continuous debate as to whether these are developmental abnormalities or neoplasm. A probable explanation is that exostosis arises due to endochondral ossification into a herniated portion of the growth plate adjacent to the physis[3]. Osteochondromas are commonly identified during childhood and adolescence and present in two distinct clinical forms: single lesion (solitary Osteochondroma / osteochondromatous exostosis / osteocartilaginous exostosis / exostosis) or multiple lesions (heredity multiple exostosis / multiple cartilaginous exostosis / hereditary osteochondromatosis / multiple hereditary osteochondromatosis). They arise commonly from the metaphysis of long bones especially the distal femur and proximal tibia, with around 40% of these lesions occurring around the knee.[4,5] The occurrence of solitary osteochondroma around the proximal femur is less encountered as a vast majority of these lesions are asymptomatic.[6] Solitary exostosis around the proximal femur are well known to be associated with painful hip range of movements, trochanteric bursitis, snapping hip syndrome or local compression of the sciatic nerve necessitating surgical

excision[6]. We present a case of an unusual presentation of a solitary osteochondroma arising from the lesser trochanter in skeletally mature adult patient managed with surgical excision.

CASE REPORT

A 32 years old male labourer presented to the outpatient department with complaints of pain and swelling in the right groin area for 9 months. The patient complained of a dull aching continuous pain in the right groin area which was aggravated by his routine activities at work and associated with a limping gait. He experienced severe pain and restricted hip range of movements while performing squatting and ground level activities. There was no history of trauma or constitutional symptoms and no complaints in other large joints of the body.

Local examination of the right hip revealed a diffuse, ill-defined, globular swelling of about 10 cm × 8 cm over inner aspect of thigh. The mass was hard in consistency with irregular surface and the overlying skin and soft tissue was normal. The mass was tender on deep palpation and hip flexion, adduction and rotations were restricted and painful. There was no localised lymphadenopathy and no distal neurovascular deficit.

Radiographs of the hip region showed a sessile bony protuberance arising from the lesser trochanter, comprising of cortical and medullary bone, showing precise continuity with the parent bone (Figure 1). CT scan also showed complimentary evidence of continuity of cortical and spongy bone further clinching the diagnosis of osteochondroma (Figure 2). The mass was projecting in anterior, medial and posterior directions without causing any cortical breech or compression effects on surrounding neurovascular structures. MRI revealed an exophytic lesion arising from the lesser trochanter and medial aspect of femoral neck measuring approx. 6.8×3.4×4.6 cm with a cartilage cap measuring 15 mm in thickness which is hypo intense on T1 and hyper intense on Short tau inversion recovery (STIR) images (Figure 3). There were no radiological markers suggestive of malignant changes. Other routine laboratory investigations were normal.

Considering the uncommon age of presentation and the increased risk of malignancy, a CT guided biopsy (Figure 4) was done which was also consistent with the findings of a benign solitary osteochondroma. Since the patient's Activities of Daily Living (ADL) were significantly affected, surgical excision of the lesion was planned. The patient was operated under regional anaesthesia in lateral position through posterior approach. The entire tumour mass could be isolated and en-bloc resection was done by performing osteotomy at the base of the lesser trochanter confirmed by intra operative fluoroscopy. The tumour along with the capsule was sent for histopathological examination (Figure 5) and the raw base was covered with bone wax. Post-operative X-rays confirmed complete removal of the mass and gradual hip range of movements started. Patient was kept non weight bearing for four weeks. Patient returned to his daily activities by six weeks post-operative and two year follow up has shown no evidence of any local recurrence.

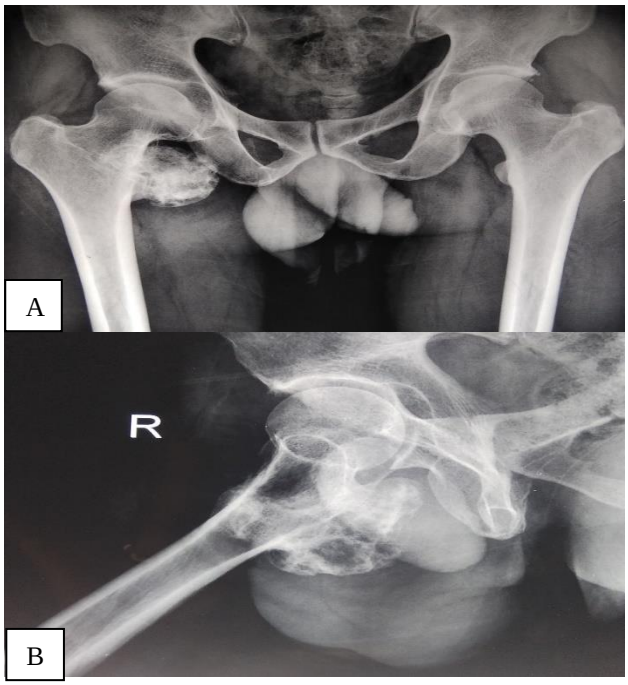

Figure 1: Plain radiographs of the pelvis region (A) anteroposterior view and (B) lateral view.

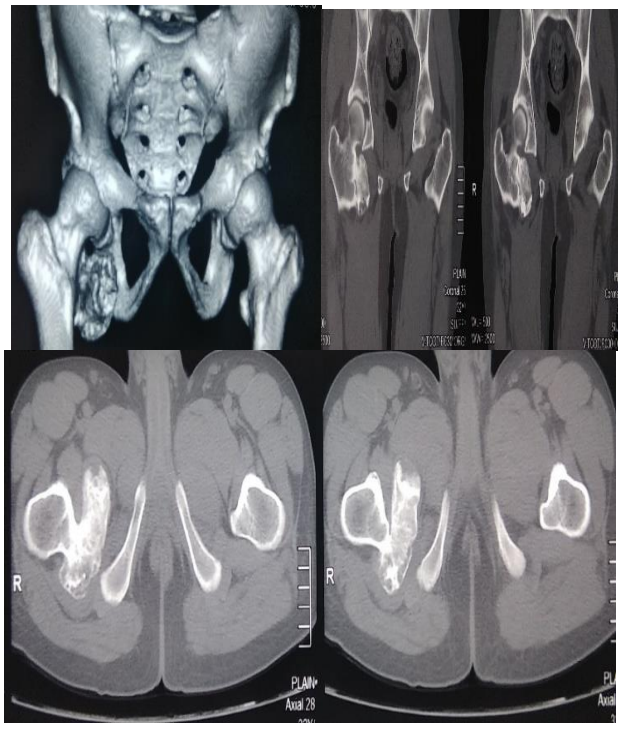

Figure 2: CT scan showing continuity of cortex and medulla between the tumour and the parent bone. (pathognomonic sign in osteochondroma).

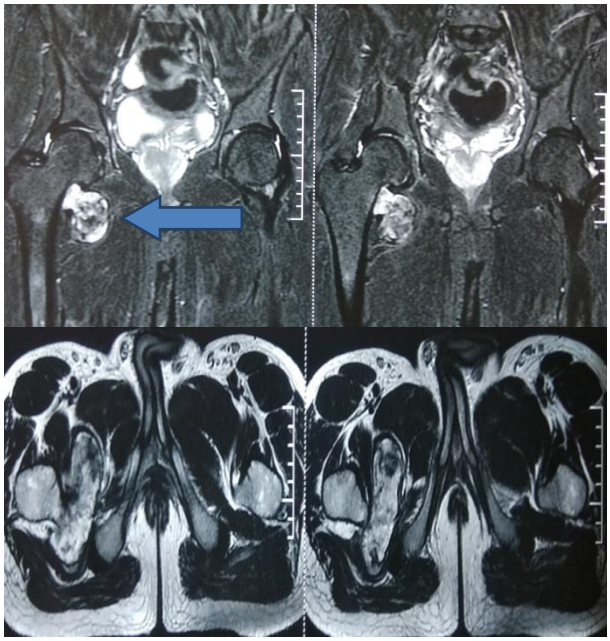

Figure 3: MRI showing of the extent of local spread in anterior, posterior and medial direction with a covering cartilage cap, STIR images (arrow).

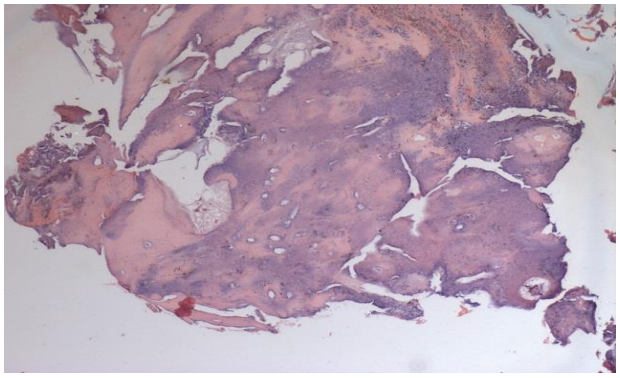

Figure 4: Histopathology slide picture of osteochondroma.

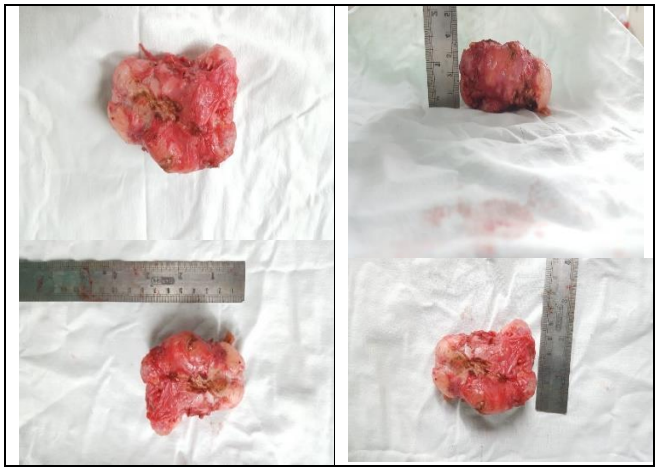

Figure 5: Excised specimen of tumour mass.

DISCUSSION

Osteochondromas represent 10% of all bone tumours and 20-50% of all benign tumours affecting mainly the appendicular skeleton during childhood or adolescence.[7] The exact etiology for formation of osteochondroma is still unclear. The most accepted theory points to alteration in the growth plate causing herniation and subsequent endochondral ossification. The striking similarity between the cartilage cap and the growth plate and the usual cessation of growth of exostosis beyond the age of skeletal maturity also support this theory.[3,8]

The incidence of osteochondroma around the proximal femur is rare. Saglik et al in their series of 313 patients of solitary osteochondroma reported an incidence of 4.8% around the proximal femur and 5.1% around the hip joint.[5] Most of these lesions are asymptomatic although fixed anatomic effects of proximal femur exostosis such as painful hip movements, labrum tears, external snapping hip syndrome, trochanteric bursitis, sciatic nerve compression and hip dislocation are well-known, necessitating surgical excision.[9,10] Acetabular dysplasia and coxa valga are more commonly associated with Hereditary Multiple Exostosis (HME) than solitary exostosis.[10] Weiner and Hoyt identified increased femoral anteversion in 25 patients with osteochondroma adjacent to the lesser trochanter.[11]

The most serious complication is malignant transformation of an osteochondroma into a secondary chondrosarcoma. Lesions located closer to axial skeleton (hip, pelvis, shoulder) show an increased risk of malignant transformation due to delayed diagnosis in these cases.[12] The incidence of sarcomatous change in patients with a solitary osteochondroma has been reported to be between 1% and 2%, whereas the incidence in patients with HME varies between 1% to 25%.[13] The warning signs include presence of pain, growth of the tumour beyond skeletal maturity, radiographic features of extensive calcification of flake type and irregularities in the tumour matrix and a cartilage cap thickness more than 1.5 cm.[5,8]

Radiographic evaluation (X-ray, CT, MRI) play a pivotal role in confirming the diagnosis and estimating prognosis. The continuity of the cortex and medulla of the lesion with that of the native bone is the pathognomonic feature of osteochondroma[8]. MRI is the gold standard investigation of choice to assess the thickness of the cartilage cap covering the exostosis. Irregular cartilage cap with thickness exceeding 15mm have a higher risk of malignant transformation, although it should be borne in mind that younger patients can present with cartilage cap measuring 1-3cm without signs of malignancy.[5,8,12] Our patient presented with an exostosis arising from the proximal femur with a cartilage cap measuring 15 mm in thickness and showing features of growth beyond skeletal maturity age causing significant pain and restricted hip movements.

Considering all these factors, surgical resection of the lesion was planned.

For cases presenting with an osteochondroma around the proximal femur, an adequate surgical approach to the whole lesion is often difficult as it involves anterior, posterior and inferior aspect of the femoral neck. The main concerns for surgical resection of femoral neck osteochondromas are adequate exposure and femoral head vascularity[10]. Siebenrock and Ganz reported a series of four patients with osteochondroma of femoral neck using a versatile lateral approach with trochanteric osteotomy and femoral head dislocation which allows a global access to the lesion[14]. Tschokanow reported two cases of lesser trochanter osteochondroma: the first case operated by anterior approach which got complicated by femoral vein laceration and sciatic nerve palsy, the second case operated in two-staged procedure (anterior and lateral) with a two month interval without any complication. With the use of anterior (3 patients) and posterolateral (3 patients) approaches[15], Ramos-Pascua performed surgical excision in six patients without hip dislocation[16]. Feeley and Kelly have reported the use of hip arthroscopy as a treatment modality for femur neck exostosis without any known complications[17]. To conclude, it can be said that there is no uniform consensus regarding the treatment plan for these lesions in literature. Proper pre-operative planning (CT, MRI) and intraoperative use of fluoroscopy will help the surgeon to exactly localise the mass and its extent. The choice of surgical approach lies in the comfort of the operating surgeon to carry out safe and adequate resection in the most effective manner to avoid complications and local recurrence.[10] In our patient, we carried out surgical resection of the lesion using posterolateral approach. With the help of intraoperative fluoroscopy, we could delineate the entire tumour mass and remove it effectively without causing any iatrogenic fracture or injury to the surrounding vital structures.

Bottner et al reported a series of 86 patients to investigate the outcome of surgical excision of osteochondroma. [13] 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. In our case, we did not find local recurrence of the tumour over a follow up period of two years.

Almost all studies conclude that surgical excision of symptomatic osteochondroma is a successful form of treatment with a low morbidity. The morbidity of the surgery is found to be comparable to that of removal of hardware. However, it is necessary to keep the patients with solitary osteochondromas around the proximal femur under observation for early detection of complications.

CONCLUSION

Solitary osteochondroma around the proximal femur is a rare manifestation. Appropriate pre-operative radiological assessment (CT, MRI) plays a key role to assess the location and spread of tumour. Surgical excision of a symptomatic osteochondroma is a successful form of treatment with low morbidity. The choice of surgical approach should allow the operating surgeon a global access to the lesion to carry out a safe and adequate resection in an effective manner. Patients should be followed up on regular intervals for early detection of malignant changes. Surgical excision of solitary osteochondroma gives successful outcomes and should be advocated as a primary modality of treatment in symptomatic cases.

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