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Prophylactic curettage and internal fixation for a benign cystic lesion of the proximal femur: A case report

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Abstract

Unicameral bone cyst (UBC) is a benign, expansile, non-neoplastic bony lesion characterized by spaces that are separated by fibrous septae. These sometimes may threaten the architectural strength of the proximal femoral trabecular arrangement because of the destructive effect of the cyst on the bone and the propensity to develop into a pathological fracture, especially under the influence of weight-bearing. We report a case of a solitary bone cyst in the proximal femur in a 15 year old girl, which was treated with curettage, synthetic bone grafting and prophylactic internal fixation with a dynamic hip screw (DHS). At 2 years follow-up, the lesion had completely healed and patient was pain-free and without any deformity. We suggest this method of treatment to be ideal for UBCs at this site, especially in the skeletally immature.

Keywords: Proximal femur, unicameral bone cyst, curettage, prophylactic fixation

Introduction

The proximal femur is a common site of occurrence of a number of benign bony lesions like unicameral (UBC) and aneurysmal (ABC) bone cysts. UBCs are true cysts with unknown origins. They occur more frequently in males and are usually diagnosed in the first 2 decades [1]. Pathological fractures and incidental finding are the most common presentations. Frequent locations include the proximal humerus and proximal femur in children [2]. Radiographically, they appear as radiolucent central metaphyseal lesions with mild expansion and a narrow zone of transition. UBCs often abut growth plates and move away with skeletal growth. A 'fallen leaf' sign, where a fracture fragment falls to the dependent portion of the lesion, is seen in approximately 5% of lesions [3, 4]. Loculations and pathologic fracture can best be appreciated on CT. MRI shows low T1 and high T2 signal with rim enhancement typical of a cyst. A single layer of mesothelial cells comprises the cyst wall and is seen in conjunction with pressurized serous fluid on histology [5]. UBCs tend to elongate with skeletal growth and then spontaneously fill-in at maturity. Patients with large lesions at a young age or pathological fractures should be considered for surgical treatment. Aspiration of the fluid for cytologic diagnosis, followed by injection of various substances like sclerosants, steroids, bone marrow aspirate, and demineralized bone matrix can be done to try and stimulate healing and spontaneous filling [6]. Curettage and grafting with or without internal fixation is performed in older children and adolescents. UBCs in high-risk locations such as the femoral neck are treated with weight bearing and/or activity restrictions, aspiration and injection, or curettage with either placement of allograft cortical strut (younger patients) or internal fixation (Postpubertal) [7].

Case report

A young female, aged 15 years, presented to our tertiary care center in western Maharashtra with insidious onset, dull aching pain in the right hip, aggravated by walking and physical activity and relieved by rest, without any history of constitutional symptoms. On examination, she had painfully restricted hip abduction and internal rotation.

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X-rays and NCCT of the hip showed a focal lytic lesion in the femoral head and neck with sclerotic margins, with LOBULATIONS and an associated focal defect in the cortex. There was no surrounding periosteal reaction or soft tissue involvement. On MRI, T1 and T2 weighted STIR images revealed large, focal well defined altered SI in the marrow in the femoral head and neck with a narrow zone of transition, suggestive of a benign cystic lesion. Cyst aspiration was done and revealed a reddish fluid with lymphocytic predominant cells. The patient underwent a thorough curettage of the lesion followed by bone grafting using synthetic (TRIOSITE) graft with internal fixation using a dynamic hip screw (DHS). Post-operatively, she was advised a period of restricted weight bearing until radiological healing of the lesion, followed by return to normal activities. She was followed up at 3, 6, 12 and 24 months to assess the status of healing and to look for signs of recurrence. At 2 years follow up, her Harris Hip Score was 95 as compared to 64 pre-op, suggesting an excellent functional outcome [8]. Radiologically there was complete healing of the lesion without any signs of recurrence.

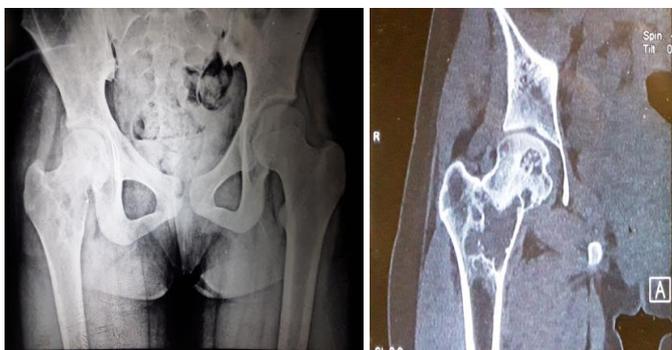


Fig 1(a): Pre-OP X-ray and (b): NCCT: Benign bone cyst in RT proximal femur



Fig 2: MR images of the lesion.

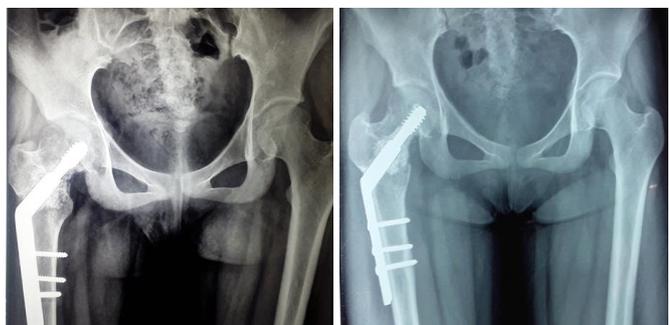


Fig 3(a): Immediate Post-OP and (b): 2 year follow up X-rays.

Discussion

The optimal treatment for UBC's is debatable. In spite of the number of techniques reported in literature, there remains a recurrence risk is 25–50% with a greater likelihood associated

with younger age [5]. At present, curettage and filling the cavity with bone graft or polymethylmethacrylate cement is the principal modality used [9]. Large defects are often created after curettage of bone cysts and are difficult to treat. Many reconstructive options are available to fill these defects and to provide structural integrity to the bone, such as allogenic or autogenic bone grafts and many different bone substitutes [10]. Vascularized bone grafting has been suggested as the best method to replace large bone defects due to its faster incorporation and remodeling, but is a technically demanding procedure [11]. Our choice was to use synthetic bone graft (beta tri-calcium phosphate and hydroxyapatite combination) as it is easily available, circumvents the morbidity associated with autograft harvest and provides an excellent structural support [12]. In the present case, the final construct which consisted of a fixed angle device with synthetic graft (void filler) was stable and allowed progressive weight-bearing without graft failure.

Conclusion

Treatment for benign cystic lesions of the proximal femur should be individualized, taking into account the location and extent of the tumour, and the forces acting on the hip. We recommend that large solitary bone cysts in proximity to the physis, especially in skeletally immature individuals, should be extensively curetted and filled with synthetic/autogenous bone graft and prophylactic fixation should be done to prevent a pathological fracture and to give support to the graft.

Patient declaration statement

“The authors certify that they have obtained all appropriate patient consent forms. In the form the patient/guardian has given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patient/guardian understands that his/her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.”

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