

## Case Report

# Intralesional extended curettage with fibular strut for the treatment of large peritrochanteric cyst: a case report and review of literature

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## ABSTRACT

Simple bone cysts are benign bone lesions commonly found in children and adolescents. They are usually asymptomatic and are incidentally detected on imaging studies. However, in rare cases, simple bone cysts can grow to a large size and cause symptoms such as pain and functional limitations. We present a case report of a large peritrochanteric simple bone cyst in an adolescent male who presented with hip pain and difficulty in walking. The diagnosis was confirmed by radiographic findings and histopathological examination of the cyst. The patient was managed with curettage and auto allo bone grafting with fibular strut and supplementary plate fixation. Patient had a favourable outcome with complete resolution of symptoms at 18-month follow-up. Our case report highlights the need of fixation for large simple bone cyst in proximal femur region along with curettage and bone grafting.

**Keywords:** Simple bone cyst, Benign bone tumor, Proximal femur cyst

## INTRODUCTION

Simple bone cysts, also known as unicameral bone cysts (UBCs) or solitary bone cysts, are benign bone lesions that are commonly seen in children and adolescents, with a male predominance.<sup>1</sup> It can occur in any bone, but it is most commonly found in the long bones of the lower extremities. Simple bone cysts are usually asymptomatic and are often discovered incidentally on imaging studies performed for other reasons. However, when they occur in weight-bearing bones, they can cause pain, growth disturbances and pathological fractures.<sup>2</sup>

Up to 3% of all documented bone lesions are UBC, but as many cases of this benign pathology go undiagnosed, its true frequency is probably greater.<sup>3</sup> The aneurysmal bone cyst (ABC), monostotic fibrous dysplasia, atypical eosinophilic granuloma, enchondroma, and intraosseous ganglia are other lesions that should be taken into account in the differential diagnosis.<sup>4</sup> Multiple treatment options

are described in the literature ranging from intralesional injections, curettage bone grafting to decompression or combined techniques.<sup>5</sup>

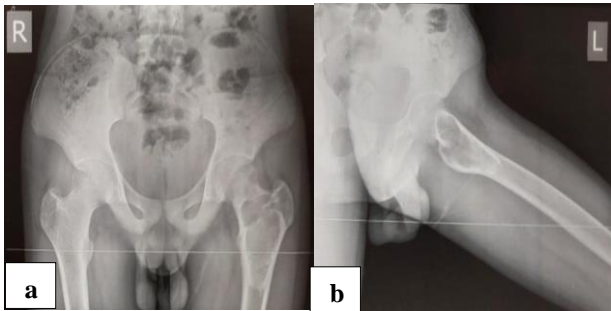
Here, we present a case report of a large peritrochanteric simple bone cyst in an adolescent male who presented with hip pain and difficulty in walking.

## CASE REPORT

A 16-year-old male presented to our orthopaedic clinic with a complaint of left hip pain that had been progressively worsening for the past six months. The pain was localized to the lateral aspect of the left hip and was aggravated by weight-bearing activities and prolonged standing. The patient reported no history of trauma or prior hip surgery. He denied any constitutional symptoms such as fever, chills, or weight loss. Patient was treated earlier with needle aspiration and corticosteroid injection. On physical examination, there was tenderness over the lateral

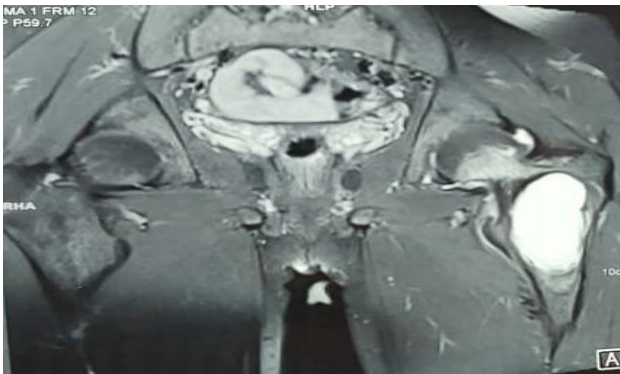
aspect of the left hip, and the patient had a limping gait with decreased range of motion in the left hip joint.

Radiographic imaging, including anteroposterior (AP) and lateral radiographs of the left hip, revealed a large, well-defined, lytic lesion with sclerotic margins without any periosteal reaction involving the proximal portion of the left femur in the trochanteric region extending to neck femur as well as subtrochanteric region approximately 6×4 cm in size (Figure 1).



**Figure 1: AP and lateral radiographs showing lytic lesion in left proximal femur with sclerotic margin.**

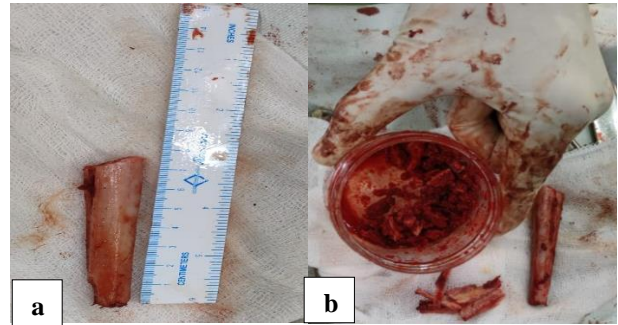
Magnetic resonance imaging (MRI) of the left hip showed a well-circumscribed, hypointense lesion on T1-weighted images and hyperintense lesion on T2-weighted images, consistent with a simple bone cyst (Figure 2).



**Figure 2: T2 weighted coronal MRI image showing hyperintense single cavity in left proximal femur.**

Based on the clinical presentation and radiographic findings, a provisional diagnosis of a large peritrochanteric simple bone cyst was made. After discussing the treatment plan with the patient and his parents and receiving their consent, it was decided to go with curettage and bone grafting. Since the cystic cavity was large, in addition to autograft plan to use allograft was made. Under general anaesthesia, a lateral approach to the hip was used, and a cortical window was made in the lateral cortex of the femur with the help of the dynamic hip screw (DHS) reamer to access the cyst. The cyst was curetted thoroughly and extended curettage was done with hydrogen peroxide. Samples of the curettage were sent for a biopsy. Ipsilateral fibular strut of appropriate size was harvested and used to

support the calcar portion of neck of femur which was weakened due to cyst. After thorough wash the cavity was filled with fibular strut graft and morselized fibula graft mixed with the allograft (Figure 3). Supplementary buttress plate fixation with clover leaf plate done to prevent backing of fibula strut graft and to give support to the weakened bone (Figure 4).

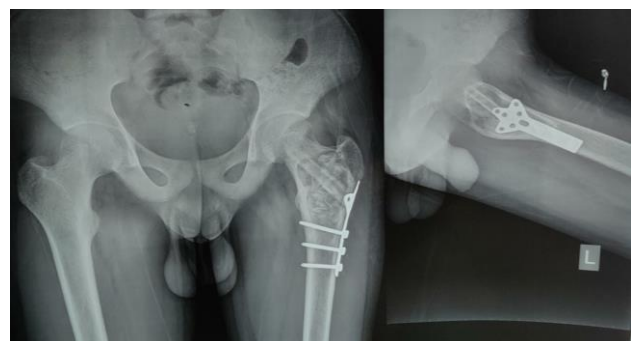


**Figure 3: Intraoperative images showing fibular strut autograft along with allograft and morselized fibula graft used for surgery.**



**Figure 4: Immediate post-surgery radiograph showing bone graft filled cavity along with supplementary buttress plate fixation.**

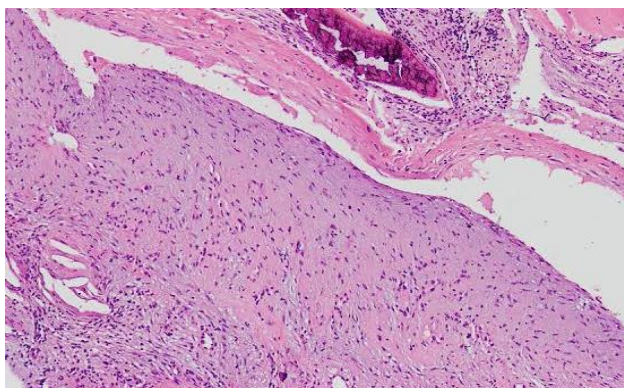
Post procedure he was mobilized nil weight bearing until the bone graft was seen to be incorporated radiologically. 6 weeks post procedure X-rays showed healing of the lesion and incorporation of bone graft, after which patient was allowed full weight-bearing (Figure 5).



**Figure 5: AP and lateral radiographs after 6 weeks post-surgery with healing and incorporation of the bone graft.**



The histopathological features showed stroma consisting of proliferative fibroblasts, spindle cells, areas of osteoid formation, and uneven, large cystic spaces filled with blood and separated by fibrous septa alternating with solid areas suggestive of simple bone cyst (Figure 6).

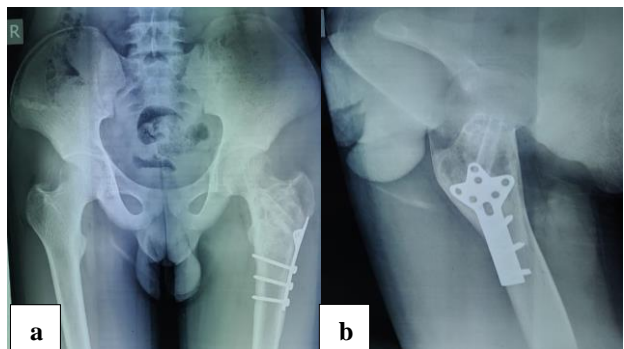


**Figure 6: Histopathological image showing cyst wall containing fibroblasts, spindle cells and areas of osteoid formation.**

At 6-months follow-up, the patient had no pain and was walking without support with a full range of hip movements (Figure 7). No signs of recurrence were seen radiologically at final follow up of 18 months (Figure 8).



**Figure 7: Clinical follow up with normal squatting and cross leg sitting.**



**Figure 8: AP and lateral radiographs showing final follow up at 18 months with healed simple bone cyst with well incorporated bone graft.**

## DISCUSSION

UBCs are a common benign bone tumor that develops in growing children. They typically present with no symptoms, and the diagnosis is frequently confirmed after a pathologic fracture occurs.<sup>6</sup>

UBCs were assumed to be a pathologic response to bone damage or to intraosseous synovial cysts causing venous occlusion and subsequent deposition of interstitial fluid.<sup>7,8</sup> Chigira et al investigated the fluid pressure within the cyst and discovered that it was roughly 2-3 mmHg higher than the pressure in the contralateral normal bone, further supporting the theory that venous blockage is the primary etiological cause in the development of UBC.<sup>9</sup> UBCs in proximal femur are should be differentiated from other lytic lesions such as aneurysmal bone cyst (ABC), monostotic fibrous dysplasia, atypical eosinophilic granuloma, non-ossifying fibroma.<sup>10</sup> Classical fallen leaf sign only occurs in fewer than 10% of individuals, and if the cyst has been multiloculated following a prior pathologic fracture, it is not something that should be expected.<sup>4</sup> Since there were few septations and a big cystic cavity on the radiographs in our instance, the possibility of an aneurysmal bone cyst was also taken into consideration. Furthermore, MRI workup showed a single large cavity suggestive of unicameral bone cyst.

Multiple treatments for treating benign bone lesions such as simple bone cysts are documented in the literature. Erol et al in their retrospective study found good clinical outcomes for proximal femur benign bone lesions and recommended biopsy, curettage, bone grafting, and internal fixation when required.<sup>11</sup> Canavese et al compared percutaneous curettage, steroid injections and bone marrow injections and concluded cyst healing may be aided by mechanical rupture of the cyst membrane, and this method may be preferred over intralesional injections.<sup>12</sup> In a systematic review and metaanalysis Kadhim et al found using autograft, allograft, or any other bone substitutes, surgical curettage produced a 90% recovery rate. Utilizing IM nails also resulted in a high healing rate.<sup>13</sup> Another study with mean age of 10.4 years advised retrograde flexible nailing for the treatment of trochanteric and neck femur simple bone cysts.<sup>14</sup> In our case, since age of the patient was 16 years and cystic lesion was involving area from neck to subtrochanteric region retrograde nailing was not preferred. In a cochrane review by Zhao et al, authors concluded use of steroid injections over bone marrow injections.<sup>6</sup> In the present case, patient had received intralesional steroid under image intensifier guidance but not responded to the same.

A recent review study recommends internal stabilization for big cystic lesions in the proximal femur.<sup>15</sup> In our case cystic lesion was involving trochanteric area with extension into calcar portion of the neck as well as subtrochanteric area hence surgical treatment with extended curettage, auto-allo bone grafting with use of fibula strut for supporting calcar portion of neck and

supplementary buttress plate fixation was done. Bone graft was well taken up in the follow up and excellent functional outcomes were seen in the follow up. Our outcome findings are concurrent with the current literature.<sup>11,15</sup>

There is paucity in literature on the treatment of large peritrochanteric cysts, and only few studies have evaluated the use of intralesional extended curettage with a fibular strut.<sup>16,17</sup> However, several studies have reported successful outcomes with curettage and bone grafting for these tumors.<sup>6,13,15</sup>

## CONCLUSION

Peritrochanteric simple bone cysts are benign bone lesions that commonly occur in the proximal femur. Although the etiology and pathogenesis of these cysts are not fully understood, current literature suggests that they may be associated with defects in the bone metabolism or a combination of genetic and environmental factors. Diagnosis is typically made through radiographic imaging, and treatment depends on the size and location of the cyst, as well as the age and clinical status of the patient. With appropriate management, patients with peritrochanteric simple bone cysts can achieve good outcomes and return to normal function. Our case report highlights the need of fixation for large simple bone cyst in proximal femur region along with curettage and bone grafting.

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