Extended Curettage And Internal Fixation In A Recurrent Proximal Femur Simple Bone Cyst: a Case Report And Review Of Literature

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Article ID: WMC001127
Article Type: Case Report
Submitted on: 06-Nov-2010, 03:16:49 PM GMT   Published on: 08-Nov-2010, 10:11:13 PM GMT
Article URL: http://www.webmedcentral.com/article_view/1127
Subject Categories: ORTHOPAEDICS
Keywords: Extended, Curettage, Allograft, Simple bone cyst

How to cite the article: Prabhakar S, Kumar V, Bali K, Mootha A, Bhusan C. Extended Curettage And Internal Fixation In A Recurrent Proximal Femur Simple Bone Cyst: a Case Report And Review Of Literature.
WebmedCentral ORTHOPAEDICS 2010;1(11):WMC001127

Source(s) of Funding:
We did not receive any funding from any source for this study.

Competing Interests:
We do not have any competing interest/s.
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Abstract

Simple bone cyst appears to be a reactive or developmental disorder characterised by a solitary cavity lined by membrane of variable thickness and filled with a clear, yellow fluid.

We report a sixteen years old female who presented with recurrence of lesion despite curettage and fibular grafting: extended curettage with removal of fibrous membrane and use of abundant allograft to fill the cavity along with stabilisation with dynamic hip screw yielded satisfactory results till date in terms of hip function and radiographic union.

Introduction

The simple bone cyst (SBC), also called unicameral bone cyst, is a tumor-like lesion of unknown cause, attributed to a local disturbance of bone growth (1,2). Although the pathogenesis is still unknown, the lesion appears to be reactive or developmental rather than to represent a true neoplasm. SBC consists of a solitary cavity lined by a membrane of variable thickness and filled with a clear yellow fluid. It represents approximately 3% of all primary bone lesions. Eighty-five percent occur in the first 2 decades with a 2:1 male predominance. Any bone of the extremities can be affected, but unicameral bone cysts are most common in the proximal humerus and femur. In adults, the ilium and calcaneus are more common locations.

The lesions are most active during skeletal growth and usually heal spontaneously at maturity (2,3). Unicameral bone cysts often are asymptomatic, unless a pathological fracture has occurred. Two thirds of patients present with fractures, which can stimulate the cyst to heal. Unicameral bone cysts in the flat bones usually are asymptomatic, are found incidentally, and rarely fracture (4,5).

A 16 years old female presented to our outpatient department with complains of pain in right hip of 6 months duration. Pain was insidious in onset, localized, dull aching, aggravated with physical activity and relieved with analgesics. Plain radiographs revealed centrally located, well-circumscribed, radiolucent lesion with sclerotic margins within the proximal metaphysis of right femur, abutting from the cartilaginous growth plate. The cortex was thinned out and the width of the lesion did not exceed the width of the neighboring growth plate. Periosteal reaction was absent. The patient was treated surgically by curettage and fibular grafting.

Symptoms resolved for short duration to recur again. Now patient developed pain in the same hip with similar characteristics as earlier. Pain was followed by limp (antalgic gait) and was able to walk supported by cane in opposite hand. Patient was not able to sit on low lying chairs nor able to sit cross-legged. On clinical examination, hip range of motion were painful and restricted in terminal arc of motion. There was no limb length discrepancy nor thigh muscle atrophy. Plain radiographs of right hip with femur showed cystic cavity in the metaphyseal region, with graft resorbed and fibula lying freely in cavity in different orientation.

Patient was re-operated with right hip opened by antero-lateral approach; cystic lesion was localised under C-arm. Cavity was thoroughly curetted, fibrous membrane was removed and sent for histopathological examination. Allograft (formalin preserved femoral head) was packed into the curetted cavity and mechanical stabilisation was done by short barrel 130 degree D.H.S. (Dynamic Hip Screw). Patient was kept non weight bearing for four weeks and gradual weight bearing with help of crutches started. Radiographs at one year of follow up reveals, graft fully incorporated with native bone and cystic cavity obliterated. The patient was able to walk painless, unaided, full weight bearing with full range of motion at the hip without any restriction of functional
activity.

Discussion

Bone cysts are benign lesions found primarily in children. An orthopaedic surgeon needs to be able to recognize the clinical and radiographic hallmarks of the two most common cysts: the Unicameral bone cyst (UBC) and the Aneurysmal bone cyst (ABC), in order to treat them appropriately. The UBC is a benign unilocular or partially septated fluid-filled cyst also referred to as a simple or solitary bone cyst (5,6). The exact pathogenesis of these cystic lesions remains unproven. The most accepted possibility is a focal defect in metaphyseal remodelling that causes a blockage to interstitial fluid drainage. This results in elevated intraosseous pressure leading to focal bone necrosis and accumulation of fluid. Subsequent work has shown that the cyst fluid itself contributes to the bony destruction as it contains prostaglandins, oxygen-free radicals, interleukins, cytokines and metalloproteinases. The prostaglandins stimulate osteoclasts to resorb bone leading to the accumulation of more fluid. The only indication for treatment of a UBC is to decrease the potential risk of pathologic fracture as they are benign and self-limited.

Treatment should be considered in large cysts or any cystic area in a site that experiences high stress and is at increased risk for fracture, such as the proximal femur (7,8). Standard options include aspiration of cystic fluid with injection of steroids or curettage and bone grafting with or without internal fixation. UBCs were initially treated with curettage and bone grafting, but the recurrence rate was 40-60%. Steroid injection into UBCs was described as an effective new treatment option that was inexpensive and involved less morbidity. The technique is hypothesized to work either by an anti-prostaglandin effect or by decreasing the pressure of the cyst after initially drilling a hole and aspirating the fluid cavity. If the lesion does not show signs of radiographic healing in 2 months, repeat injections should be considered. After three injections without healing, many surgeons treat UBC with curettage and bone grafting (6,7,8). Either autograft or allograft can be used to fill the curetted cavity. Recurrence is demonstrated by further bony destruction and resorption of the bone graft which usually occurs within 6 months of the first surgery and is unusual after 2 years. Recurrences often occur in long bones and are more likely in active or aggressive lesions. Most authors use adjuvant treatment such as phenol intraoperatively (9,10). Supplementing curettage with cryotherapy has decreased the recurrence rate to 8-18% in different studies.

Conclusion

Thorough removal of fibrous membrane, curettage and filling of the cavity with abundant autograft and stabilization with adequate implant(s) helps achieve optimal outcome in terms of function and radiological union.

References

Illustrations

Illustration 1

Pre-op radiograph showing Simple bone cyst of proximal femur

FIGURE 1:
Illustration 2

Radiographs showing recurrent SBC and free lying fibula in the cavity

FIGURE 2:
Illustration 3

Radiographs at follow-up showing radiological union

FIGURE 3:
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