Case Report 2

Arthroscopic treatment of an aneurysmal bone cyst of the patella: A case report

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Abstract

Aneurysmal bone cyst is a benign tumor-like bone lesion. This report concerns a 43 year-old male patient diagnosed with a primary aneurysmal bone cyst of his right patella. His main presentation was anterior knee pain. The patient was treated with arthroscopic excisional biopsy of the cyst and curettage, followed by filling the cavity with bone cement at a second stage. During the 5-year follow-up, the patient remained symptom free, with a normal range of motion. The arthroscopic approach is a less-invasive procedure with low morbidity and enabled us to determine which site should be going through.

Keywords: aneurysmal bone cyst, arthroscopic curettage, bone cement, patella

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Introduction

Aneurysmal bone cyst (ABC) is an uncommon benign tumor-like lesion. [1] Although benign, ABC can be locally aggressive, cause extensive weakening of the bony structure and impinge on the surrounding tissues. [2] It is the third most common lesion arising in the patella after chondroblastoma and giant cell tumor and accounts for 10% of all patellar lesions. [3] Treating this lesion in the patella can be achieved through patellectomy, [4] curettage and filling the defect with autologous bone graft or allograft, or curettage and filling the defect with bone cement. [5] Patellectomy had a great biomechanical effect on the knee extensor mechanism. Also, a series of specialized imaging studies are necessary for planning management of patellar tumors and decide patellectomy or curettage. Curettage may increase the risk of recurrence and done in stage I, II patellar tumors. [6] Patellectomy is indicated in more aggressive tumors and reconstruction of the extensor mechanism is necessary with a resultant extensor lag. [7] Treatment may be combined with adjuvant therapy. The overall recurrence rate after adjuvant therapy is 17% with no additional recurrence after retreatment. [8]

The aim of this case report is to introduce a relatively less-invasive surgical procedure in the form of arthroscopic surgical treatment of this relatively rare benign lesion in the patella.

Case Report

A 43-year-old male teacher presented to the outpatient clinic with a 3-month history of right anterior knee pain. He reported that the pain worsened while climbing stairs. A clinical examination demonstrated mild tenderness of the patellofemoral joint on the patella apprehension test and on full flexion of the knee. A plain X-ray of the knee showed a typical osteolytic lesion involving the distal 1/2 of the patella, with areas of trabeculae with a soap bubble appearance, clear lesion margins, and an atypical expansile cortex (Fig. 1). Magnetic resonance imaging (MRI) showed a low-intensity lesion on both T1- and T2-weighted images, with low fluid levels in the cavities (Fig. 1).

Arthroscopy was carried out, which showed an area of roughness of the patellar undersurface cartilage on the lateral patellar ridge. After shaving this ridge, the cyst opened into the knee joint, and clear fluid tinged with blood drained into the knee. The lining of the cyst was curetted and sent for histological examination and shaved with a high-speed shaver burr.

Histological examination of the cyst showed fragments of lamellar bony trabeculae with a hyaline cartilaginous covering with multinucleated giant cells surrounded by cellular fibrous stroma and multiple elongated and dilated vascular spaces within the fibrous stroma (Fig. 1). The histological report confirmed the diagnosis of an aneurysmal bone cyst. Two weeks later, the cyst was filled with bone cement rather than a bone graft to reduce the chance of recurrence. Physical exercises of the knee and full weight-bearing mobilization started as usual. He regained a full range of motion within 2 months.

A subsequent X-ray examination showed a normal position of the bone cement with no radiolucent lines between the cement and the cortex (Fig. 1). Assessment of the knee with the Lysholm score was excellent (100 points). During a 5-year follow-up period by clinical examination and X-ray, the patient remained pain free with a full range of motion, including sitting on the floor, kneeling, and praying.

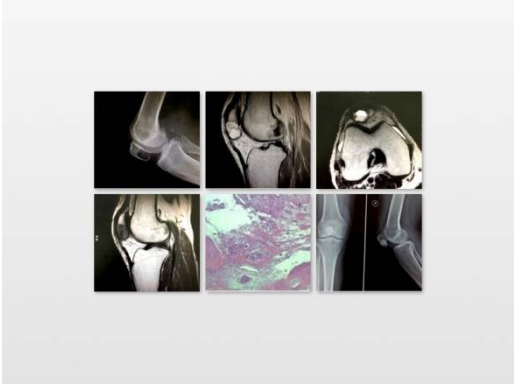

Fig. (1), Plain X-ray shows ABC lesion distal 1/2 of patella, T1 & T2 weighted image and T2 with fluid level, Histological exam of ABC lesion shows large septa, little reactive bone formation, few giant cells and some osteoblastic activity along with anastomosing bony trabeculae and Postoperative plain X-ray, showing bone cement filling the cyst

Discussion

ABC represents less than 1% of primary bone tumors and has a tendency to develop in the metaphysis and less frequently in the spine and sacrum. [5] Less than 1% of all cases of ABC affect the patella, with tendency to affect patients in their second decade of life. [9] ABC in the patella can be primary [9] or result from trauma or a preexisting lesion [10] Six cases of aneurysmal cyst in the patella were reported in 35 years in metacentric study of four European countries [10] and 14 cases have been published in the literature. [1, 3, 9, 10]

ABC presents with diverse clinical features but usually includes mechanical pain that is rarely associated with functional incapacity. ABC may be discovered by chance due to a complication from disease progression, particularly a pathological fracture. The current case presented with anterior knee pain of moderate intensity. Clinical examination of the knee is usually normal or shows some swelling of the patella or slight atrophy of the quadriceps. The patient in this report presented patellofemoral tenderness on the patellofemoral apprehension test. MRI finding was consistent with the reported literature. [7, 11]

The treatment options for ABC vary from curettage and bone graft to bone cement with adjuvant therapy to patellectomy. [12] Adjuvant therapy is intended to treat microscopic disease contamination within the tumor bed to lower the incidence of local recurrence. [5] Adjuvant therapy options include cryotherapy, sclerotherapy, and radionuclide ablation.

Enneking surgical staging system can be used to standardize the operative treatment for patellar tumours [13, 14] Our patient had a stage-II, III lesion. Patellectomy is indicated in stage-III lesions [12] However, at the insistence of our patient, we attempted an arthroscopic reconstructive procedure to salvage the patella. Bone cement packing reduces the local recurrence rate in biologically comparable tumors such as giant cell tumors of bone. [15] Total patellectomy or resection of the inferior patellar pole seemed to be an over treatment, especially because the main retropatellar surface was not affected.

A direct mid-line approach was used generally in all cases reported early with risk of breaking through the anteriorly thinned wall of the cyst with fearing of soft tissue contamination. Arthroscopy enabled us to determine which site should be going through for the second stage to avoid the weakened area. Therefore, we suggested arthroscopy beforehand to be one of modalities for determining surgery.

In the present case report, the cyst was completely excised through arthroscopy using a shaver burr to remove the cyst lining. Arthroscopy enables us to visualize the cyst clearly without opening the knee and to deal with the lining wall of the cyst aggressively that have been the site for possible recurrence. Filling the cavity with bone cement followed arthroscopy gives us the opportunity to decline the adjuvant therapy usually used to prevent recurrence. The arthroscopic approach is a less-invasive procedure with low morbidity, and during the 5-year follow-up, the patient remained symptom free.

Conclusion

ABC is a rare lesion of the patella presenting with anterior knee pain. Arthroscopic curettage and shaving using a high-speed burr is an effective and feasible surgical modality that carries low morbidity and accelerates postoperative rehabilitation.

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