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Case Report

Curettage and bone grafting for simple bone cyst of humeral head in a young woman: arthroscopic approach and step towards minimal invasive surgery

Nirav G. Soni, Jaimeen P. Jesalpura*

Department of Orthopaedic, Vaishvi Orthopaedic Hospital, Jetalpur Road, Vadodara, Gujarat, India

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***Correspondence:**
Dr. Jaimeen P. Jesalpura,
E-mail: vaishviortho@gmail.com

ABSTRACT

The simple bone cyst (SBC) also called unicameral bone cyst is a tumor-like lesion of unknown cause, attributed to a local disturbance of the bone growth. Although the pathogenesis is still unknown, the lesion appears to be reactive or developmental . Traumatic etiology of simple bone cysts remains an enigma up to now. We present a case of 44 year old woman who came with c/o pain in right shoulder due to fall from vehicle 5 months back with X-ray and MRI both suggestive of cystic lesion over greater tuberosity humeral head . Patient was treated with arthroscopic curettage and bone grafting. In the last decade, however, there has been an exponential growth in the use of minimally invasive surgical techniques. This is particularly seen in the shoulder, where multiple arthroscopic and procedures have been described in the treatment of intra- and extra-articular pathologies.

Keywords: Traumatic simple bone cyst humerus, Arthroscopic excision, Bone grafting

INTRODUCTION

Simple bone cyst (SBC) is a benign lesion also known as solitary, unicameral, or traumatic bone cyst and radiographically, is seen as a mildly expansile, lytic thin-walled bone lesion without periosteal reaction.[1] The etiology of simple bone cyst (SBC) remains inconclusive, although the lesion seems to be dysplastic or reactive rather than a true tumor. Theories being proposed include local disturbances in bone growth, pressure effects due to blocked fluid drainage, local venous obstruction etc.[2] Cases of SBC following trauma have been observed, theorized to be forming consequently from intraosseous hemorrhage when mechanisms of bone organization and repair fail.

Since 1974, when Scaglietti introduced intralesional injection with corticosteroids, several options of percutaneous or minimally invasive treatment have appeared.[3] However, the success rate of these procedures is variable.

The open curettage with or without bone grafting is still the cornerstone for treatment and superior to steroid injection. Here, we introduce arthroscopic curettage for SBC with the expectation that this procedure will have lower invasiveness and relatively higher success rate compared to other traditional procedures.[4]

CASE REPORT

A 44 year old woman came with chief complaint of pain in right shoulder since last 3 months. Patient had history of trauma due to fall from two wheeler 5 months ago. On examination active forward flexion of patient was 140 degree, while prom (passive range of motion) was

180/180/90/l4 flexion/abduction/external rotation /internal rotation respectively. Patient with elbow in flexion had external rotation/internal rotation of 90/90. Patient had good strength of supraspinatus while doing empty can test and also good strength of infraspinatus muscle.

Patient after having trauma went to some other hospital where she was treated with some medications and steroid injections but she didn't get relief from her pain.

Her investigations showed plain radiographs revealed a medullary sclerotic lesion in the right proximal humerus with foci of calcification (Figure 1).

Figure 1: Pre-operative X-ray.

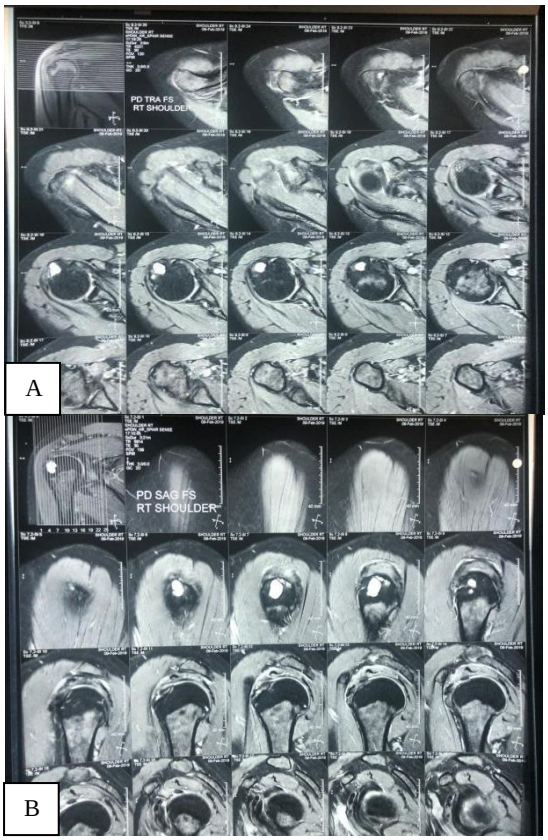

Figure 2 (A and B): Cyst at humeral head.

MR images showed a homogenous low signal intensity lesion on T1-weighted and contrast-enhanced sequences, but a high signal intensity one on T2-weighted sequences (Figure 2). This lesion was diagnosed as simple bone cyst from the imaging studies.

At the operating room, with the patient's informed consent, we performed surgery (Figure 3).

Figure 3: Operative position and markings.

The localization of the tumor was identified with an image intensifier. After making an approximately 1 cm incision in the skin, the soft tissue was bluntly dissected until reaching the bone surface. The cortical bone was pierced with a trocar, and intraosseous fluid was obtained through the pierced bone and observed for its color and properties. The small bone hole was enlarged using step-up cannulated drills up to 7 or 8 mm.

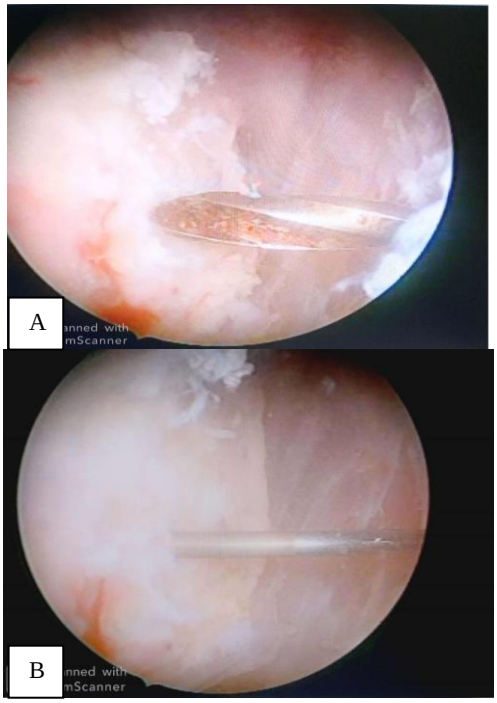

Figure 4 (A and B): Intra-operartive cyst broken with needle.

Under endoscopic visualization, the surgical instruments, including arthroscopic curette, were inserted through the portal at various angles (Figure 5).

Figure 5: Arthroscope insertion.

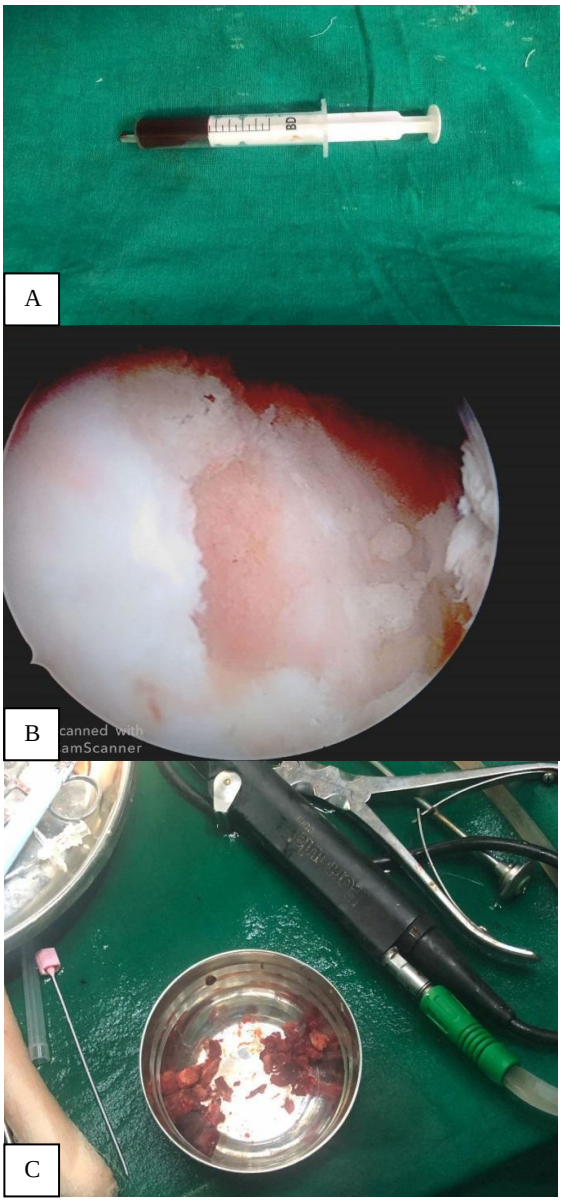

Figure 6 (A-C): Cyst excision with bone grafting.

The cystic lesion was thoroughly removed until the normal bone was seen in the medullary cavity. The cavity was covered with funnel and bone graft taken from patient as is (anterior superios iliac spine) was introduced (Figure 6).

The cavity was completely filled with the autologous graft and funnel was removed followed by no further suction inside the joint with sampling of curetted tissue for final histopathological analysis (Figure 7).

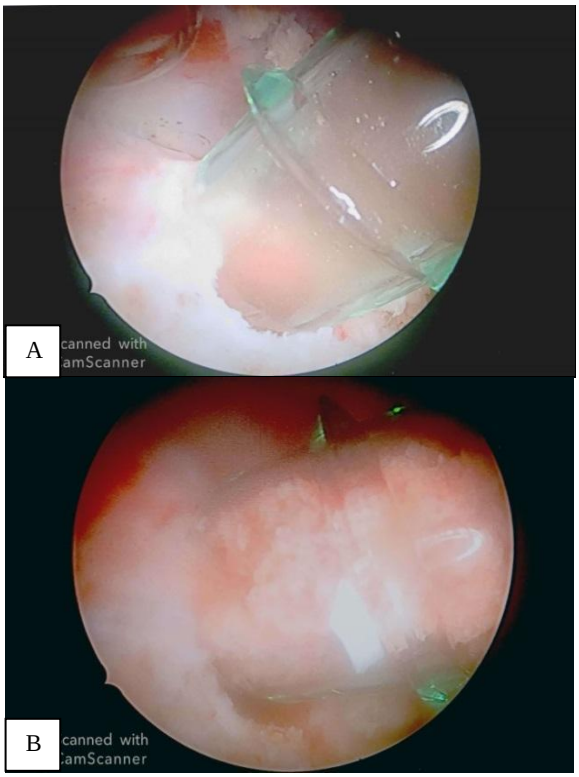

Figure 7 (A and B): Bone graft inserted arthroscopically.

Post-operatively, the patient had full active range of shoulder motion on the affected side by the first week, with no wound complications or infection. Follow-up radiographs showed no progression of the lesion. With VAS score 0/10.

DISCUSSION

Simple bone cysts are common, benign lesions and appear mainly on the humerus and femur, before skeletal maturity. Its diagnosis appears several times after minor trauma.[1] Harnet et al, in their review of prevailing etiopathogenetic hypotheses for SBC, have found the "trauma-hemorrhage" theory the most widely accepted by authors.[1]

The main minimally invasive treatment options are intracystic injections with corticosteroid or bone marrow.[2] The first treatment reduces the production of

the cystic fluid from its inner wall, thus increasing bone healing.

Bone marrow injection has been suggested to speed up the cicatrisation due to its osteogenic potential, allowing the bone to remodel itself. Both options seem to have similar results. In 1986, Campanacci et al reported that 32% of patients with bone cyst had a recurrence or no change after the first treatment.[3] In 2007, Wright et al reported the result of steroid injection therapy by randomized control trial with a comparison to autologous bone marrow injection, revealing the superiority of steroid injection.[4,5]

However, open surgery with curettage and bone grafting remains as the gold standard treatment for some authors.[6] Cho et al compared the results of both methods of treatment and stated that the surgical treatment showed results that were significantly better and reduced recurrence and the number of procedures required.

The advantages of the arthroscopic procedures over the conventional surgery: minimal incisions are made, blood loss is negligible, and rehabilitation can be initiated earlier. Furthermore, blind drilling or excessive curettage, which could lead to intraoperative fracture or brittleness of the treated bone, can be avoided.[7] The possibility of also performing diagnostic arthroscopy allows us not just to evaluate the quality of the cartilage adjacent to the cyst but also to rule out other intra- and extra-articular lesions that may contribute to the patient's clinical condition.

This report shows the advantages of arthroscopy for the treatment of a simple bone cyst of the humeral head with a good outcome and no signs of recurrence. The positive results shown in this clinical case suggest that it may become a good option for the surgical treatment of simple bone cysts.

Major differential diagnoses for a similarly located lesion in a young adult include aneurysmal bone cyst, monostotic fibrous dysplasia, enchondroma, and eosinophilic granuloma. All of these lesions may be radiolucent on plain x-rays.[8] However, clinical features typically associated with each of these lesions help differentiate these other diagnoses from SBC.

Thus, standardization of this treatment for every institution might be difficult, but we believe that arthroscopic technique can be applied for cyst removal.

CONCLUSION

Thus hereby conclude that these cases provides support to a possible association to trauma of solitary bone cysts occurring in the adult population and suggest this subset of patients may require a different treatment approach. This case report appears to be the case of arthroscopic treatment of a unicameral bone cyst with local autograft on greater tuberosity humerus.

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