



Unusual localization of an aneurysmal bone cyst in ulnar coronoid process

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Aneurysmal bone cysts are non-neoplastic, expansile, osteolytic tumor-like conditions. All bones may be involved, but the most commonly affected is the metaphysis of the long bones, especially the tibia, humerus and femur. We present a 13-year-old female patient with a cystic lesion with cortical continuity and a large bone cyst in the coronoid process of the ulna. The bone cyst was treated with curettage, phenol application and cement implantation following cyst debulking. Aneurysmal bone tumors are rare tumor-like conditions and localization at the coronoid process of the ulna with mechanical block of the elbow motion has yet to be reported. Debulking and curettage of the lesion and bone cement implantation are useful methods for local control of aneurysmal bone cysts.

Key words: Aneurysmal bone cyst; coronoid process; mechanical block.

Aneurysmal bone cysts are non-neoplastic, expansile, osteolytic tumor-like conditions first described by Jaffe in 1942.^[1,2] Histopathological findings of aneurysmal bone cysts include composition of blood-filled spaces separated by connective tissue septa containing fibroblasts, osteoclast-type giant cells and reactive woven bone.^[2-5]

Aneurysmal bone cysts may involve any bone in the skeleton, and are most common in the spine and metaphyseal regions of the long bones. Rare and atypical locations have been published in the literature but the involvement of the ulnar coronoid process in aneurysmal bone cysts resulting in a mechanical block of the elbow range of motion have not previously been reported to our knowledge.^[1-10]

Recently, several treatment options, such as resection, bone grafting or cement implantation following

curettage, angioembolization, and radiation ablation therapy, have been described.^[5,9-14]

The coronoid process is located at the anterior aspect of the proximal ulna. The importance of the coronoid process on the elbow stability has been described in many biomechanical and clinical studies.^[15,16]

The aim of this study was to report an atypical location of an aneurysmal bone cyst which caused elbow range of motion restriction and treatment to preserve elbow motion and stability using debulking surgery.

Case report

A 13-year-old female patient presented with pain and swelling at the anterior aspect of the left elbow for 12 months and elbow motion restriction, especially in flexion and supination for 6 months. The patient expe-

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Submitted: February 6, 2011 **Accepted:** June 16, 2011

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Available online at
www.aott.org.tr
doi:10.3944/AOTT.2012.2630
QR (Quick Response) Code:





Fig. 1. (a) Anteroposterior and (b) lateral radiographs showing the expansile, osteolytic bone lesion located at the coronoid process (arrows).

rienced a sport injury two months prior to the onset of symptoms. At clinical examination, elbow flexion was 95 degrees. Extension loss of 15 degrees and supination of 5 degrees was measured and no pronation restriction was observed. Elbow flexion was restricted by an anterior mechanical block due to a mass at the coronoid process. Direct radiographs, computerized tomography (CT) and magnetic resonance imaging (MRI) were taken for radiological examinations. An osteolytic and expanded lesion with cortical thinning at the coronoid process of the ulna was observed on the lateral radiograph (Fig. 1). CT and MRI displayed cortical continuity of the cystic lesion and fluid level in the cyst (Figs. 2 and 3).

An anterior surgical approach was chosen to reach the lesion in the coronoid (Fig. 4a). The median nerve and brachial artery were retracted laterally and the common flexors were retracted medially. The lesion was visualized after detachment of the pronator muscle from the anterior aspect of the proximal ulna. The anterior 1/3 part of the bone cyst causing the mechanical block was removed. The articular surface and anteromedial side of the coronoid process were left intact. Improvement in flexion restriction was achieved (Fig. 4b). Curettage of the lesion and phenol instillation for medical therapy was then performed after shaving the entire cyst wall, using a high-speed burr. The bone defect was filled with PMMA bone cement and the articular surface of the coronoid was supported with bone cement.

Postoperative active and passive elbow motions were permitted as soon as possible. CT taken after removal of hemovac suction showed total filling of the cyst with bone cement (Fig. 5).

The diagnosis of aneurysmal bone cyst was confirmed by the pathological evaluation.

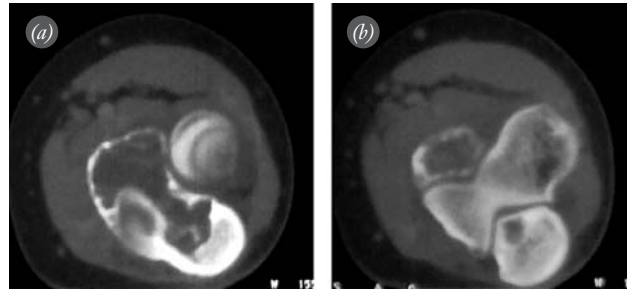


Fig. 2. (a, b) CT views showing the expansile, osteolytic lesion located at the anterior aspect of the proximal ulna.

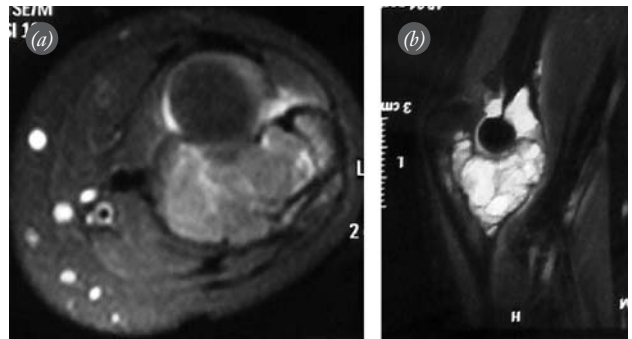


Fig. 3. (a) Axial T1-weighted MRI showing the coronoid process involved by the tumor. (b) Sagittal T2-weighted MRI showing the coronoid process enlargement due to aneurysmal bone cyst.

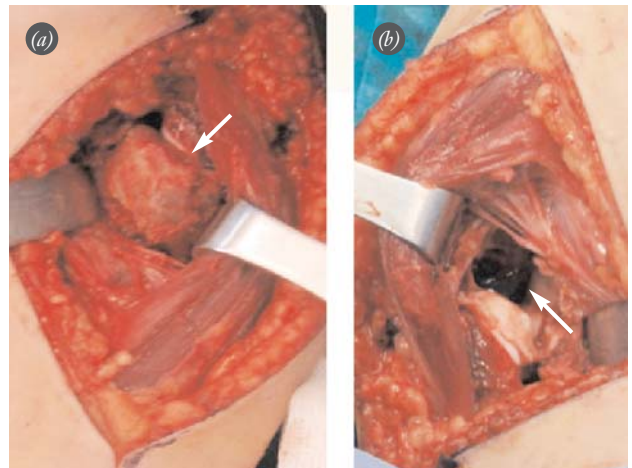


Fig. 4. (a) Clinical view of the coronoid process enlargement due to the tumor (arrow). (b) Clinical view of the cyst (arrow) after removal of the anterior wall. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

Range of motion of the elbow was measured at 125 degree flexion, 10 degree extension loss and 10 degree supination restriction with no pronation restriction at

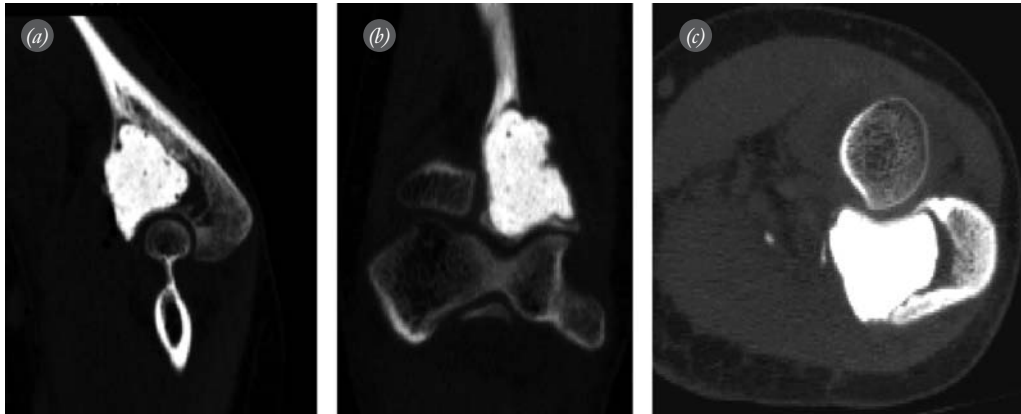


Fig. 5. (a-c) Postoperative CT views showing the intact joint surface.

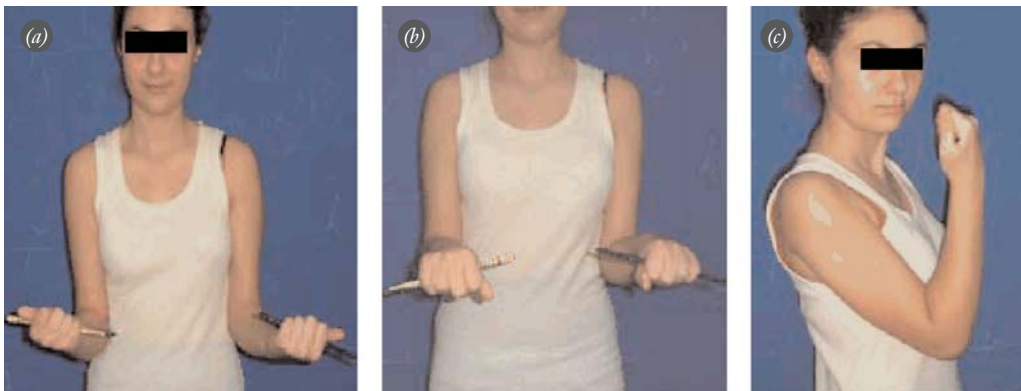


Fig. 6. (a-c) Clinical views of the elbow motion in supination, pronation and flexion. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

the 6th month follow-up (Fig. 6). Follow-up CT and radiographs showed no recurrence (Figs. 7 and 8).

Discussion

Aneurysmal bone cysts are uncommon tumor-like conditions that account for approximately 1 to 6% of all bone tumors.^[1,2] Aneurysmal bone cysts are the result of

a specific pathophysiologic change, probably a consequence of a trauma or a tumor-induced anomalous vascular process.^[5,6] Aneurysmal bone cysts are seen more often after the second decade of life. Although the metaphyseal regions of the long bones, especially the tibia, humerus and femur, are most affected by the disease, all bones of the body may be affected.^[6-8]



Fig. 7. (a) Anteroposterior and (b) lateral radiographs at the 6th month follow-up.

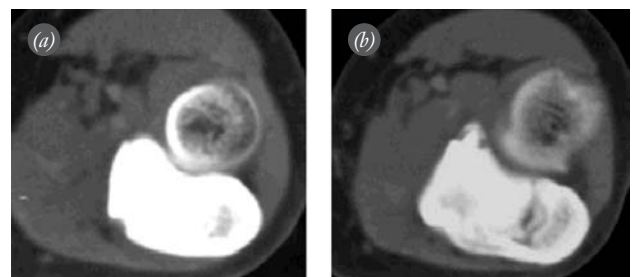


Fig. 8. (a, b) CT views at the 6th month follow-up.

Appropriate treatment of aneurysmal bone cysts requires the knowledge of its specific pathophysiological origin and behavior. Several treatment modalities have been described, such as intracystic injections, curettage, resection or embolization of the lesion.^[9-14] Recurrence rates, depending on the treatment method, have been previously published.^[3,8,9] According to Ozaki et al., local recurrence rates after curettage with cement implantation and curettage with bone grafting are 17% and 37%, respectively.^[12] Although marginal or wide resection of the lesion can lower recurrence rates, these treatments are accompanied by bone stock loss and the necessity of reconstruction of the involved extremity.^[2,7,11]

Marginal or wide resection is not appropriate in the coronoid process of the ulna because reconstruction following resecting may be difficult. In addition, the coronoid process, due to its clinically and biomechanically proved role in the stabilization of the elbow, should not be removed.^[15,16] To preserve anatomical and biomechanical structures of the coronoid process, we performed a debulking surgery; curettage of the lesion using a high-speed burr, phenol instillation, and bone cement implantation. According to the literature, this method has been used to successfully treat aneurysmal bone cysts in other well-known localizations and local recurrence rates were significantly reduced.^[13,14]

In conclusion, aneurysmal bone cysts are rare, tumor-like conditions and the involvement of the coronoid process of the ulna producing a mechanical block has not yet been reported to our knowledge. Debulking surgery with curettage and bone cement implantation is a useful treatment option for aneurysmal bone cysts located in the ulnar coronoid process. This method can resolve mechanical blocks on elbow range of motion.

Conflicts of Interest: No conflicts declared.

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