



**Case Report**

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## Treatment of a clavicular aneurysmal bone cyst with fibula allograft: A case report

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### ABSTRACT

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Aneurysmal bone cyst (ABC) is defined as an expansile and osteolytic lesion, containing cystic cavities full of blood, which although benign, has a locally destructive course. The most preferred treatment method is surgery. Curettage and bone grafts are often used. The case is here presented of an ABC located in the clavicle, which was successfully treated with fibula allograft.

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### 1. Introduction

Aneurysmal bone cyst (ABC) is defined as an expansile and osteolytic lesion, containing cystic cavities full of blood, which although benign, has a locally destructive course (Jaffe and Lichtenstein, 1942). They constitute 1% of all bone tumours and 80% of cases are aged below 20 years. They are often seen in the metaphyseal sections of the long bones, in vertebra posterior elements and in the iliac bone (Arata et al., 1981). Clavicle is a very rare site for aneurysmal bone cyst with only few cases reported in literature (Yashavnta et al., 2014). The case is here presented of an ABC

located in the clavicle, which was successfully treated with fibula allograft.

### 2. Case

A 7-year old male patient was brought to the orthopedic department with complaints of pain and swelling in the right shoulder which had started 6 months previously and was worsening. It was learned from the patient history that there had been no response from non-narcotic analgesics for the pain but shoulder movement had increased. In the physical examination no deformity was seen in the shoulder or clavicle. In the distal clavicle,

swelling was felt and sensitivity was determined with palpation. Cervical, axillary or supraclavicular lymph nodes were not determined. Shoulder range of movement was full but movements were painful. The radial, ulnar and median nerves were evaluated as normal in motor and sensory examinations. On direct radiographs, eccentric, radiolucent destructive lesions were seen which were widening the cortex and causing expansion in the distal clavicle (Fig. 1).

A fine sclerosis was seen around the lesion and within the lesion, septa and trabeculations. Although evident cortical thinning was seen on computed tomography (CT) (Fig. 1), the lesion was not seen to have extended beyond the cortex. On magnetic resonance imaging (MRI) a cystic lesion was observed of fluid-fluid levels with multiple septa, 30 x 16 x 14.5mm in dimension, located at the distal end of the clavicle, which was causing significant expansion in the bone and thinning of the cortex. As an initial diagnosis, ABC, giant cell tumour, non-ossified fibroma, eosinophilic granuloma and osteomyelitis were considered. A needle biopsy was applied to the patient for diagnostic purposes. In the histopathological evaluation giant cells with multinuclei were seen and a histiocytic, fibroblastic thin membrane rich in capillaries.

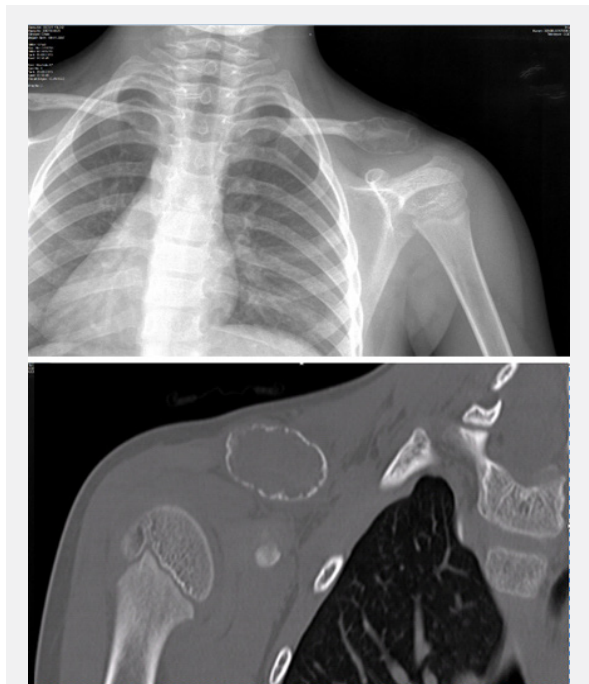


Fig. 1. On the left side preoperative direct radiography and right side computed tomography: Eccentric, radiolucent destructive lesions were seen which were widening the cortex and causing expansion in the distal clavicle.

Surgery was planned for the patient and the operation was performed under general anaesthesia. The mass was reached by entering over the right clavicle. The cortex

around the lesion was very thin and there was seen to be leakage from within of fluid of serohaemorrhagic consistency. Following curettage of the inside of the lesion, reconstruction of the distal clavicle was made with 4 cm fibula allograft. Fixation of the allograft was made with K-wires (Fig. 2). During the 24-month follow-up period, no recurrence was determined (Fig. 2). The remodelling using the fibula allograft showed pleasing results.



Fig. 2. Following curettage of the inside of the lesion postoperative radiograph and postoperative radiography after 24-month follow-up period.

### 3. Discussion

As ABCs are destructive and recurrent lesions, treatment must be adequate and complete. The most preferred treatment method is surgery (Gitelis and McDonald, 1998). Curettage and bone grafts are often used. Recurrence rates following this treatment have been reported as 14%-34% (Gitelis and McDonald, 1998). To reduce recurrence, aggressive curettage or total resection of the involved segment can be applied in patients with a destructive extensive lesion. Reconstruction following resection can be made with autogenous or allogeneous bone grafts. In serious structural defects, strut graft may be used. In cases where it is necessary, graft fixation can be applied using conventional plate, screw or intramedullary rods (Jaffe and Lichtenstein, 1942).

Reconstruction with the fibula following resection of the radius with a tumour was first applied as an autogenous structural bone graft by Walther (Springfield, 1996). In terms of length, geometric shape and strength, the fibula is a suitable bone to be transferred to a tubular bone (Doi et al., 1997). Although there has been evidence of better results from autogenous grafts than allografts, many studies have reported better results from allografts (Cheng and Gebhardt, 1991). The use of allografts has the advantages of no donor site morbidity, a change in several sizes and limited source. In a study by Marco and Miller, good treatment of permanent stability of large cystic cavities was reported to have been provided with fibular allograft in a young population (Kapoor et al., 2004).

Reconstruction with non-vascularised bone grafts can be applied without the need for special training

or equipment, is an inexpensive and simple procedure and results are good (Başarrı, 2005). In the long bones of patients aged below 15 years, in centrally located lesions, particularly those which are active and have an aggressive course, surgically insufficient curettage has been reported together with high rates of recurrence (Dormans et al., 2004). To reduce the risk of recurrence in the current case of a locally aggressive ABC in the clavicle, the bone defect occurring after extensive curettage was treated with fibula allograft and at the end of a 2-year follow-up period, no recurrence was observed.

In conclusion, the application of aggressive treatment is useful to prevent recurrence in patients with a large, destructive lesion. In a young population, to provide stability in large cystic cavities, fibula allograft can be considered for use in the reconstruction of defects occurring after extensive curettage.

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