

# Aneurysmal Bone Cyst

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## ABSTRACT

An aneurysmal bone cyst is benign expansile tumour-like cystic lesions of bone composed of blood-filled spaces separated by connective tissue septa. The term "aneurysmal" refers to both the radiographic appearance of the bones, which have the distended appearance of an aneurysm, and also to the large cystic blood-filled spaces found at operation. The term "aneurysmal bone cyst" has been accepted throughout the world, although the lesion to which it refers is neither an aneurysm nor a bone cyst. They are seen more in children than in adults. The exact cause is not known there are a few theories that have been given. Diagnosis is done with a variety of radiographic methods, after which treatment is provided according to the lesion. The main problem is the recurrence of the cyst even after treatment. This review aims to overview the basic knowledge of aneurysmal bone cyst.

**Key words:** Aneurysmal Bone Cysts, Lesions, Radiographs, Benign, Pathology

**HOW TO CITE THIS ARTICLE:** Mp.Brundha, Palati Sinduja, Priyadharshini Aneurysmal Bone Cyst, J Res Med Dent Sci, 2021, 9(12): 430-432

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**Received:** 01/12/2021  
**Accepted:** 15/12/2021

## INTRODUCTION

Aneurysmal bone cysts, which is abbreviated as ABC, are an osteolytic bone neoplasm that is characterized by serum or blood-filled spaces that are mostly non-endothelial and of different diameters. It is an expansile cystic lesion that occurs in any bone of the body. Even though they are mostly benign, they are locally aggressive and lead to intense weakness of the structures of the bone and impinge on surrounding tissues [1]. It has a greater affinity towards the spine and long bones and is more commonly seen in younger people and can develop in both females and males as there is no preference for sex. It is being considered as a secondary vascular phenomenon superimposed on the preexisting lesion, the primary though an involution change initiates an intraosseous arteriovenous malformation and thereby creates via hemodynamic forces, a secondary reactive lesion of the bone which is ABC. Recurrence is not uncommon.

## Literature Review

### Pathophysiology

The exact pathophysiology is not very well known, but several theories have been given to explain the cause and pathophysiology of ABC. Some of the most accepted theories or ideas include vascular malformations, these

include arteriovenous fistulas and venous blockage, increased venous pressure resulting in dilation and rupture of the local vascular network, the vascular lesions cause increased pressure, expansion, erosion, and resorption of the surrounding bone. Arteriovenous fistulas within the bone are considered as primary aetiology. The evidence supporting the haemodynamic hypothesis includes the often marked and occasionally rapid extension of some of these cysts, the common operative finding of a blood-filled cyst, the blood often welling up, occasionally to the extent of giving rise to some concern and angiography may sometimes show changes suggesting a vascular lesion and the presence of an arteriovenous shunt. However few pathologic specimens or findings contain tissues that are highly characteristic or diagnostic of giant cell tumours, chondroblastoma, hemangioma, osteoblastoma, chondromyxoid fibroma and other tumours and ABC may be caused via a haemodynamic reaction secondary to these bony lesions or tumours. They are mostly metaphyseal or diaphyseal and are most often eccentrically located which an important distinguishing radiographic feature from other bone cysts. The lesion shows marked thinning of the cortex over the site with minimal bone formation which is clear when seen in computer tomography or magnetic resonance imaging. Along with being eccentric, they are mostly irregular in structure and sometimes show calcification in the central areas[2,3].

## Symptoms

Patients usually encounter pain which tends to increase with time, there might be a mass, swelling or a pathologic fracture or a combination of these symptoms. The temperature of the skin may increase around the bone and there might be restricted movements in adjacent joints. The symptoms are present for several weeks or even months before a diagnosis can be made. Apart from these symptoms there can be neurologic symptoms seen mostly in the case of the spine and there could be a weakness in the bones or stiffness of the bone, reactive torticollis, and sometimes bruit over the affected area or even deformity. Rarely ABC is asymptomatic with clinically insignificant destruction of the bone, in such cases, there should be close monitoring of the lesion [4].

## Diagnosis

The diagnosis of ABC is done with help of an X-ray or magnetic resonance imaging (MRI) examination of the affected or damaged bone. It involves the combination of X rays, MRI, CT, nuclear medicine bone scan etc. On a radiograph, well defined expansile lytic lesions are observed. Expansion of the cortex usually gives the lesion a balloon-like appearance, and larger lesions may be septate. MRI examination is a preferred method especially in the case of the spine, it helps in detecting multiple types of blood-filled spaces and walls separating the spaces. After an MRI or X-ray, a biopsy is done and the most common is FNAC which is preferred to open biopsy as it is less invasive and less complicated with increased diagnostic value. A closed biopsy technique like FNAC prevents inappropriate placing of the needle, low wound healing. Preliminary cytology findings along with radiology and biopsy help in the diagnosis of ABC [5,6].

## Treatment

Arterial embolization is a method used to treat ABC but relatively few cases only have been treated till now with this method. An embolic agent is placed at the feeding artery to cut off the nutrient supply thus altering the hemodynamics of the lesion. The advantage is of being able to reach difficult locations, save joint functions where subchondral bone destruction is present and reduces complications associated with invasive surgery by performing selective arterial embolism 48 hours before surgery. Arterial embolism is favoured in the certain diagnosis of ABC, technical feasibility and safety, no neurological involvement and in the absence of pathological fracture. The intralesional injection may be attempted for cases in which surgical access is difficult or other modalities are contraindicated. Other treatments involve ethical blood-filled injection, systemic calcitonin treatment.

The most common treatment however is surgical removal, which is done by intralesional curettage, which involves scraping out the bone to completely remove the tumour and filling the space with material such as diluted phenol, High-speed bur, which involves "shaving" the affected bone to be smooth with a high-speed drill

Electrocautery, a surgical technique that uses a high-frequency electric current to cut or seal blood vessels, Bone grafting, a surgical procedure to replace the missing bone with artificial graft material, cadaver bone or bone from another area of the patient. The surgeon may use adjuvant therapy that extends to areas of treatment beyond that which can be physically excised, liquid nitrogen is a common adjuvant. It involves chemical, freezing or thermal methods leading to necrosis and microvascular damage to the walls of the physically excised cyst leading to disruption of the possible aetiology. Recurrence of ABC is present even after surgery, however, the patient should be monitored regularly. The complications involved include recurrence, blood loss, damage of surrounding tissues, pulmonary embolism, wound infection, wound hematoma, osteomyelitis.

## Prognosis

Even though some patients may require repeated treatment because of the recurrence of ABC, which is a major problem in treating it, the prognosis as such for ABC is very good. The overall cure rate is 90-95%. In younger patients, there are increased rates of recurrence due to open growth plates and a metaphyseal location which has been associated with the recurrence. Recurrence has shown to also be dependant on the kind of treatment like some studies have shown recurrence rates of 59% in case of intralesional excision and very low rates of recurrence in case of resection.

## CONCLUSION

The review overviewed the etiopathogenesis, diagnosis and treatment options available for Aneurysmal bone cyst, an enigmatic lesion. The cause of which is not very clear making it difficult to distinguish from other lesions. Treatment is done by many methods. MRI is one of the main diagnostic methods, the prognosis of ABC is very good but the major problem faced in the case of this condition is the recurrence of the cyst or lesion, thus requiring prolonged monitoring and treatment. Advancement in osteoinductive materials in treatment may lead to the less invasive treatment of ABC.

## ACKNOWLEDGEMENT

None Declared

## CONFLICT OF INTEREST

None declared

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