Aneurysmal bone cyst of the ribs in children

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Abstract Aneurysmal bone cyst (ABC) under the age of 10 years in the ribs is rare. After reviewing the literature for the last 20 years, we found that 12% of aneurysmal bone cysts reported in patients under 10 years of age and the lesion confined most frequently to the lower extremities and localization to the ribs is extremely rare. We present a case of aneurysmal bone cyst in the rib of a 7 year old Saudi male who presented with a mass in the left 6th rib. Radiologically, it was impossible to distinguish between giant cell tumor, aneurysmal bone cyst or enchondroma. Therefore, surgical excision was performed.

Keywords: Aneurysmal bone cysts, Saudi Arabia

Aneurysm bone cysts are benign, usually solitary, expansile, blood-filled spaces imparting a multicystic appearance of bone, most often occurring in metaphysis of long bone vertebrae and flat bones. Aneurysmal bone cyst (ABC) involving a rib in a patient under the age of 10 years is rare. Review of the literature over the last 20 years demonstrated 12% of aneurysmal bone cysts were reported in patients under 10 years old, with the lesions confined most frequently to the lower extremities. Localization to a rib is extremely rare, and radiographic diagnosis is difficult as giant cell tumor, aneurysmal bone cyst and enchondroma of the rib have overlapping radiographic features.

Case Report We report a 7-year-old Saudi male who presented with a two-year history of a gradual increasing swelling of the left 6th rib. The patient denied any history of trauma, night sweats, weight loss or pain over the chest wall mass. Examination of the chest revealed a 3 cm fusiform, nontender, hard mass involving the left 6th rib at the level of the anterior axillary line. Past history was noncontributory.

A chest X-ray was reported as showing a cystic mass involving the left 6th rib in the region of the anterior axillary line measuring about 3x2 cm with an intact cortex (Fig.1). The lungs were unremarkable. Radioisotopic bone scan was noted to have concentration of contrast media in the cystic mass.

The patient underwent segmental resection of the 6th rib containing the cystic mass. The mass did not invade the underlying pleura and was not attached to the overlying muscles. His postoperative period was uneventful and he was discharged from the hospital seven days postoperatively. The patient was seen at our outpatient clinic two weeks later, the chest wall wound having healed. He was subsequently followed at six week and one-year intervals, remained asymptomatic and was discharged from the clinic.

Pathology The specimen consists of a resected rib with a brown mass 3 x 2 x 2 cm., slightly ovoid in shape and characterized by an intact paper-thin cortex. The cut surface revealed complete destruction of the bone and replaced by small, cystic cavities of various sizes filled with blood. Microscopic examination showed cystic cavities lined by granulation tissue and a few multinucleated giant cells supported by connective tissue trabeculae containing small amounts of osteoid (Fig. 2,3).

Discussion Aneurysmal bone cysts generally have been described at ages ranging from infancy to
61 years. Reviewing the literature for the last 20 years shows very few cases of aneurysmal bone cysts involving a rib. The etiology of aneurysmal bone cysts is unknown. Trauma may be a factor. Liechtenstein suggests local alteration in hemodynamics can lead to an increase in venous pressure and cysts formation. Jaffe maintains aneurysmal bone cyst is secondary and occurs in pre-existing bony lesion.

Aneurysmal bone cyst affecting the rib has been reportedly associated with pain (46%), palpable lump (21%), dyspnea (7%), paraplegia (7%) pathological fractures (7%) and as an incidental finding at routine chest x-ray in 29% of the reported cases. Aneurysmal bone cyst has been reported to occur in every rib except the lower three.

The radiologic appearance of the early lesion is as bony erosion. In advanced cases, the periosteum is raised and outlined by a thin subperiosteal rim of bone and the medullary portion of the bone appears eroded. The body of the cyst shows irregular strands or streaks of ossification. The radiological appearance of aneurysmal bone cyst in the rib is not specific enough to establish a

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**Fig. 1** - Chest X-ray. Fusiform cystic mass in the region of anterolateral 6th Rib.

**Fig. 2** - 100X Microphotograph: Higher power view of the aneurysmal bone cyst which is lined by granulation tissue, giant cells and osteoid.
Fig. 3 - 200X Microphotograph: Higher power view of the aneurysmal bone cyst showing the lining tissue osteoid and giant cells.

diagnosis or even to suggest with certainty that the lesion is benign. There is often expansion into the adjacent soft tissue with retention of a thin layer of subperiosteal new bone. There is general agreement.

Current methods of treatment include curettage and bone grafting, radiation, curettage and cryotherapy, or en bloc resection. Liechtenstein recommends curettage and bone grafting on the basis that the lesion is benign and therefore does not require radical therapy. However, curettage alone results in a recurrence rate ranging from 32-59%. Total excision is the most effective treatment as far as prevention of recurrence is concerned and recurrence has not been recorded following this procedure. Radiation should be considered only when surgical access is difficult or impossible.

References

كيسة أم الدم العظيمة في عمر دون العاشرة في الأضلاع نادرة، بعد مراجعة البحوث والدراسات العلمية خلال العشرين الماضية، وجدنا بأن 1~2% من كيسة أم الدم العظيمة المشخصة في عمر دون العاشرة تكون في الأطراف السفل الحالتين المشخصة في الأضلاع نادرة جداً.

لقد وجدنا حالة كيسة أم الدم العظيمة في الصلع السادس الأيسر في طفل عمره سبع سنوات، إنه من الصعب جداً التفريق بين كيسة أم الدم العظيمة والكيسي العظمي بواسطة الفحص الإشعاعي للأضلاع، وذلك بسبب ندرة هذا المرض في الأضلاع في الأطفال.