Primary aneurysmal cyst bone: Case report and review of the literature

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ABSTRACT

Introduction: Aneurysmal bone cyst (ABC) is a benign osteolytic lesion expansile composed of blood filled cystic cavities. They are benign lesions but locally aggressive. They can be primary or secondary as a complication of trauma or underlying another bone tumor. Aneurysmal bone cysts are mostly diagnosed in patients less than 20 years old.

Case Report: We report the case of a 24-year-old military male, with history of ankle traumatism since six months from falling from the stairs. He presented to the Radiology Department of the military hospital of Rabat where anteroposterior and lateral radiographs of the left foot were realized. They showed an osteolytic bone lesion in the proximal phalanx of the fourth toe, expansile, without periosteal reaction or calcifications, first diagnosed as chondroma and treated symptomatically by nonsteroidal anti-inflammatory drugs. The patient was referred a second time to our department for nonresolving dull aching pain in the left foot since the trauma. On physical examination, there was no palpable mass, no cutaneous sign, no motor deficit, and the local temperature was normal. Magnetic resonance imaging (MRI) was performed for further characterization of the lesion. It showed a cystic lesion that present with hypointense signal on the T1 weighted sequences and hyperintense signal on T2 weighted sequences. Contrast enhanced T1 weighted sequences showed a multicystic appearance with contrast enhancing cyst walls. There was no periosteal reaction and no extension into soft tissues. The diagnosis of aneurysmal cyst bone was made and confirmed by a biopsy. Histological data found multiple fragments of bone tissue containing areas of blood-filled cystic spaces lined by fibrous septa that are composed of uniform fibroblasts and multinucleated giant cells. The patient was treated with surgical curettage of the lesion. Evolution was marked by resolving pain.

Conclusion: In conclusion, ABC is a benign lesion revealed in most cases by pain. Magnetic resonance imaging is the best choice imaging. Fluid levels detected on the T2 weighted sequences are highly evocative. Differential diagnosis is sometimes difficult. A biopsy is necessary to confirm the diagnosis.

Keywords: Aneurysmal cyst, Bone, Osteolytic
They are eccentric, fluid-filled, and multicameral, and may develop in all bones of the skeleton but touch more frequently in the metaphysis of the long bones and in the vertebral column. Local recurrence rates of the lesion may be as high as 50%; MRI shows an eccentric bone lesion with septa. The fluid level, if present, is evocative. Diagnosis must systematically be confirmed by biopsy [1, 2]. We report a case of aneurysmal cyst bone in a 24-year-old male which was long considered as chondroma in X-rays finding.

CASE REPORT

We report the case of a 24-year-old military male, with history of ankle traumatism since six months from falling from the stairs. He presented to the Radiology Department of the military hospital of Rabat where anteroposterior and lateral radiographs of the left foot were realized. They showed an osteolytic bone lesion in the proximal phalanx of the fourth toe, expansile, without periosteal reaction or calcifications, first diagnosed as chondroma (Figure 1) and treated symptomatically by nonsteroidal anti-inflammatory drugs.

The patient was referred a second time to our department for nonresolving dull aching pain in the left foot since the trauma. On physical examination, there was no palpable mass, no cutaneous sign, no motor deficit, and the local temperature was normal.

Magnetic resonance imaging was performed for further characterization of the lesion. It showed a cystic lesion that present with hypointense signal on the T1 weighted sequences and hyperintense signal on T2 weighted sequences. Contrast enhanced T1 weighted sequences showed a multicystic appearance with contrast enhancing cyst walls. There was no periosteal reaction and no extension into soft tissues (Figure 2).

The diagnosis of aneurysmal cyst bone was made and confirmed by a biopsy. Histological data found multiple fragments of bone tissue containing areas of blood-filled cystic spaces lined by fibrous septa that are composed of uniform fibroblasts and multinucleated giant cells. The patient was treated with surgical curettage of the lesion. Evolution was marked by resolving pain.

DISCUSSION

Aneurysmal bone cyst’s histogenesis is unknown. It has been thought that ABC was caused by intraosseous hemorrhages, due to abnormal venous circulation. These hemorrhages would explain the activation of osteoclasts and bone resorption.

This theory is no longer retained for primitive ABC that present rearrangements of the USDP6 oncogene which is located on the chromosome 17, but it remains plausible in secondary ABCs which do not have translocation [2, 3]. This lesion can develop in the entire skeleton but touch more frequently long bones (67%), then in the metaphysis of the long bones and in the vertebral column.

Aneurysmal bone cyst is often revealed by pain, rarely by a fracture. Spine localization can be revealed by scoliosis, torticollis, rarely by a mass or fracture [2, 3].

In X-rays, ABC is an eccentric, osteolytic, expansive lesion, sometimes containing cystic cavities with thin septa. Cortical destruction and extension to soft tissue can simulate a malignant lesion and indicate an aggressive form. The vertebral lesions are developed in the posterior arch or both in the body and the posterior arch. In most cases, X-rays are not enough to make the diagnosis [3–5]. Computed tomography (CT) is less sensitive than MRI. In vertebral localization, it provides lesion mapping and identify the risk of fracture [3].

In CT, ABC is an osteolytic expansive lesion and tomography shows liquid density and the liquid levels.
Tomography can show cortical breach and detect associated soft tissue mass [6, 7]. Magnetic resonance imaging is the examination of choice in ABC. The typical appearance is an expansive lesion, located eccentrically in the metaphysis, lobulated or with septa. Multiple liquid levels can be detected on T2 weighted images. They are not specific but are very evocative. Fluid–fluid levels are represented by blood-filled lakes between fibrous seata with hematocrit gravitational effects [7–9].

Differential diagnosis are multiple. Telangiectatic osteosarcoma should always be eliminated by biopsy before treating any ABC. Giant cell tumor is almost never seen before closure of growth cartilages and rather reaches the epiphyso-metaphyseal zone of long bones. Eosinophilic granuloma, osteoblastoma, or malignant tumor can be confused with an ABC in spinal localizations and only the biopsy allows to make the diagnosis [3, 6].

Diagnosis must systematically be confirmed by biopsy. Histological findings are characteristic, the tumor is composed of blood-filled cystic spaces lined by fibrous seata that are composed of uniform fibroblasts and multinucleated giant cells.

Once the diagnosis is established, we have to wait 4–6 weeks after the biopsy before treating the ABC. No therapy is sure to achieve cure, except surgery with wide resection. Radiation therapy is effective, but have the risk of malignant transformation. Embolization is the only useful way to treat some ABC, especially in spine and sacral localization. The risk is the ischemia of visceral organs or spine cord. Preoperative embolization is useful to reduce the risk of bleeding of spine and sacral ABC [3, 8, 9].

CONCLUSION

In conclusion, ABC is a benign lesion revealed in most cases by pain. Magnetic resonance imaging is the best choice imaging. Fluid levels detected on the T2 weighted sequences are highly evocative. Differential diagnosis is sometimes difficult. A biopsy is necessary to confirm the diagnosis.

REFERENCES


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Author Contributions

Kaoutar Imrani – Conception of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Meryem Edderai – Design of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.
Data Availability
All relevant data are within the paper and its Supporting Information files.

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