Aneurysmal Bone Cyst Presenting in Soft Tissue: A Case Report

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Introduction

Aneurysmal bone cyst (ABC) is classically described as a benign lesion developing most often in the metaphyses of long bones and in the vertebrae. They are characterized by blood-filled spaces separated by connective tissue septa containing fibroblasts, osteoclast-like giant cells, and reactive woven bone. 

ABC is considered a non-neoplastic lesion, although some cytogenetic studies have found reproducible chromosomal abnormalities. The majority of ABCs arise de novo (primary ABC), but some have been found associated with other bony lesions secondarily. 

Lesions usually appear radiographically as well-delineated cysts with fluid-filled cystic spaces. The standard treatment of ABCs with marginal, yet complete surgical excision has shown acceptable results with minimal recurrence. 

While traditionally classified as a tumor of bone, ABCs have rarely been described as being found in soft tissues. A search of the English literature found a total of 13 cases of soft tissue ABC, with none previously described in the total/lower extremity. 

Case Report

The patient is a 44-year-old man who originally presented with complaints of a "painful lump" in his medial left ankle, separate from and incidental to his chief complaint of heel pain. Imaging on the contralateral limb, initial exam showed a firm, semi-mobile, deep mass approximately 2cm proximal and immediately posterior to the medial malleolus. This was mildly tender to palpation, but did not restrict motion of the lower extremity. Ultrasound exam revealed a 5 x 1.0cm mass posterior to the Achilles tendon and its periphery. The mass was heterogeneous and ill-defined, with no evidence of attachment to adjacent structures.

After one month of observation, the patient expressed continued pain and possible increasing size. A magnetic resonance imaging study was performed to show a 1.8 x 1.0cm heterogeneous mass abutting the posterior aspect of the tibia. Surgical resection revealed a firm, yellow-brown, well-capsulated mass within membranous soft tissue with no defined attachment to surrounding structures. The mass was tagged with suture to identify orientation and submitted to pathology as a single specimen. The patient healed uneventfully with full weight-bearing immediately post-operatively.

The specimen margins were intact per orientation and the mass was submitted to reveal a "vasculature rich, yellow-brown mass surface with calcified tissue and extensive hemorrhage.

Microscopic analysis proved incompressible and stabs were sent to an outside pathology lab for independent review by multiple pathologists. The final pathology report is as follows:

"The specimen is a circumscribed nodular heterotopic lesion. Hemorrhagic synovium and a pseudocystic appearance of the intact lesion are present. Numerous vessels are seen at the periphery of the nodule. The nodule had a vaguely multifocalized configuration with blood-filled pseudocystic spaces alternating with spindle cell areas and areas of bone formation. The center of the lesion is occupied by well-formed bone with spicules that radiate outward. The outer rim of the pseudocystic spaces is lined with proliferating fibrous connective tissue. Prominent hemorrhage is seen within the intervening spindle-cell areas. The histologic features are those of an osteoclastic aneurysmal bone cyst of soft tissue. No neoplasms are seen.

The patient remains without symptoms or signs of recurrence at a follow-up of 14 months post-operatively.

Purpose

The authors call attention to an unusual presentation of an aneurysmal bone cyst in soft tissue. Although rare, this pathology may warrant inclusion in a differential diagnosis of an unknown lower extremity soft tissue mass.

Discussion

Despite the unusual appearance of aneurysmal bone cyst in long bone metaphyses, the foot and ankle surgeon should be aware that it may also manifest in soft tissues of the lower extremity. The etiology of soft tissue ABC's remains unknown. It has been proposed that the lesion is first formed as a reaction to ectopic bone, but more likely the result of a primary osteoclastic phenomenon. While the lesion can be aggressive in growth, it is benign and can be successfully treated with surgical excision. Definitive diagnosis is made based on microscopic pathology, which is undistinguishable from the classic bony lesion (Figure 1).

References