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CASE REPORT

Aneurysmal Bone Cyst in the Distal Metaphysis of the Right Fibula: A Case Report

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ABSTRACT

21-year-old female patient, she presented increased volume and pain in the right ankle, imaging studies were carried out, evidencing alteration of the bone structure in the distal metaphysis of the fibula, having as a diagnostic option by clinic, epidemiology and imaging, ANEURISMATIC BONE CYST, due to the location of said lesion, and taking into account the percentage of recurrence of the aforementioned lesion, it was decided to perform in bloc resection of the lesion and reconstruction with ipsilateral fibula autograft, descending it and fixing it with osteosynthesis, to maintain the anatomy of the lesion. the ankle joint.

Introduction

The aneurysmal bone cyst (ABC) is a reactive bone lesion characterized by cystic cavities containing blood, often causing light to moderate pain. ABCs can exhibit aggressive growth and cortical destruction, potentially leading to deformity and pathological fractures in affected areas ¹⁻².

The term "aneurysmal bone cyst" (ABC) was first coined by Jaffe and Lichtenstein to describe blood-filled cysts with wide spaces, hemosiderin deposits, giant cells, and some cancellous bone tissue in their walls ³.

ABC accounts for 6% of primary bone lesions and can be associated with benign and malignant conditions, such as giant cell tumors, osteoblastoma, chondroblastoma, chondromyxoid fibroma, fibrous dysplasia, osteosarcoma, fibrosarcoma, or chondrosarcoma ²⁻⁴.

ABC typically occurs in the first two decades of life, representing approximately 1.4% of all primary

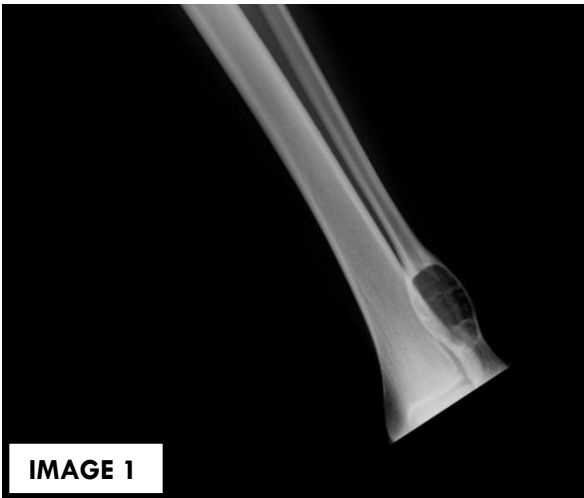
bone tumors, with an incidence of 0.14 to 0.32 per 100,000 individuals ⁵.

The metaphysis of long bones, including the humerus, femur, tibia, and fibula, is the primary location for ABCs. Patients often present with a painful mass, leading to deformity and functional impairment of the affected limb ⁵⁻⁶.

Treatment options vary but are favorable when detected early. Treatment may involve tumor excision, curettage, and cavity filling with bone graft or cement. In cases with large tumors involving major joints, preserving joint function poses a significant challenge ⁶.

Clinical Case

This case involves a 21-year-old female patient who experienced pain and swelling in the right ankle, starting in March 2021. She sought medical attention in June at the Bone Tumor Services at "Hospital Padre Machado," where X-rays revealed a lithic, expansive injury in the distal metaphysis of the fibula (image 1,2). Laboratory analyses ruled out metabolic conditions.



Given the epidemiological, clinical, and imaging data, the patient was diagnosed with an ABC. Due to the high rate of local recurrence associated with less invasive procedures, the surgical treatment chosen was a wide en bloc resection, ipsilateral fibular autograft reconstruction, and fixation with a 2.7 mm distal anatomical plate for the fibula with transdermal fixation.

Surgical Procedure

By July 2021, surgery is performed with the support of the José María Vargas Hospital Osteosynthesis Bank in Caracas. After blood exsanguination of the right lower limb and placement of a tourniquet,

lateral approach to the fibula, the lesion was visualized and confirmed by fluoroscopy, resection was performed with healthy margins of 7 cm in length in the first stage, in the second stage the approach was extended, making a cut to diaphyseal level of the fibula, descending from the fibula to the ankle region, it was fixed with a 2.7 mm 11-hole plate and a transindesmal screw was placed (image 3,4), protecting with a surodigital splint for 10 weeks. Radiological controls were carried out 2 weeks postoperatively. 6 weeks and tenth week, starting partial support at 12 weeks and full load through a guided rehabilitation program at 14 weeks.



IMAGE 3

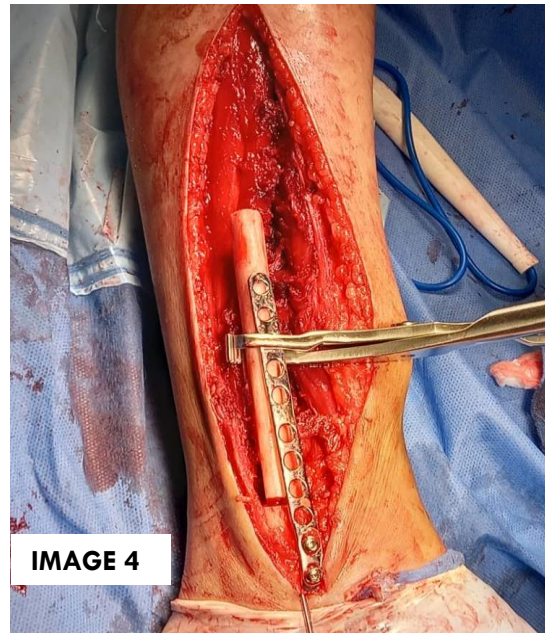


IMAGE 4

The Biopsy report yielded (image 5) **SOLID VARIANT ANEURYSMAL BONE CYST**. Patient since December 2021, she resumes her daily activities, with the use of conventional footwear, she

has been clinically and radiologically controlled every 4 months with ap and lateral X-rays, last control in August 2022(image 6).

ESTUDIO ANATOMOPATOLÓGICO

EXAMEN MACROSCÓPICO:

PERONÉ DERECHO; RESECCIÓN:

Se reciben fragmento de peroné derecho. Mide 7cm de longitud x 2.8cm de diámetro. La exploración externa se identifica cortical indemne con aumento de su diámetro en la porción central del fragmento. Al corte sagital del fragmento y a 0.3cm del borde de resección más cercano, se identifica lesión endomedular de aspecto carnoso, pardo clara de consistencia blanda. Se incluyen muestra representativa para estudio histológico definitivo.

DIAGNÓSTICO MICROSCÓPICO:

PERONÉ DERECHO; RESECCIÓN:

HALLAZGOS MORFOLÓGICOS COMPATIBLES CON LESIÓN RICA EN CÉLULAS GIGANTES:

- LESIÓN ÓSEA CARACTERIZADA POR CÉLULAS MONONUCLEADAS ESTROMALES OVALADAS Y ALGUNAS FUSIFORMES ENTREMESCLADAS CON CÉLULAS GIGANTES MULTINUCLEADAS.
- ACTIVIDAD MITÓTICA: 1 MITOSIS X MM2.
- HEMORRAGIA RECIENTE Y ANTIGUA PRESENTE (HEMOSIDERINA).
- FORMACIÓN DE HUESO REACTIVO.

NOTA: LOS HALLAZGOS MORFOLÓGICOS EN CORRELACIÓN CON LOS ESTUDIOS DE IMÁGENES PLANTEAN COMO PRIMERA OPCIÓN DIAGNÓSTICA QUE SE TRATE DE UN **QUISTE ÓSEO ANEURISMÁTICO VARIANTE SÓLIDA**, SIN EMBARGO, ES NECESARIO DESCARTAR QUE SE TRATE DE UN COMPROMISO ÓSEO SECUNDARIO POR CONDICIÓN METABÓLICA TIPO HIPERPARATIROIDISMO, TOMANDO EN CUENTA QUE SU EXPRESIÓN MORFOLÓGICA ES SIMILAR, SE SUGIERE COMPLEMENTAR EVALUACIÓN DEL PACIENTE CON ESTUDIOS PARACLÍNICOS DE CALCIO, FÓSFORO Y PARATOHORMONA. SE EVALÚA ESTUDIO RADIOLÓGICO.

IMAGE 5

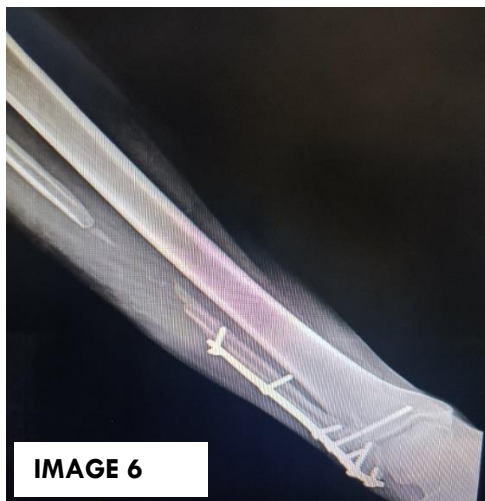


IMAGE 6



IMAGE 7



IMAGE 8

Discussion

The term "aneurysmal bone cyst" was first introduced by Jaffe and Lichtenstein in 1942, also known as Jaffe-Lichtenstein disease. ABCs can be primary or secondary, often associated with other tumors. Radiography, along with MRI, is effective for diagnosis. ABCs appear as lytic, multilobulated, expansive lesions with trabecular bone, and the diagnosis is usually confirmed histopathologically ⁷⁻⁸⁻⁹.

Although some cases of spontaneous healing have been reported, treatment is often required. Treatment options include surgical curettage with or without bone graft, complete excision, selective arterial embolization, or a combination of these procedures. In this case, en bloc resection and

fibular autograft were chosen to minimize the risk of local recurrence ¹⁰⁻¹¹⁻¹².

Conclusions

Aneurysmal bone cysts are generally benign but can be aggressive and recurrent, requiring multiple surgeries. A comprehensive evaluation, including clinical, epidemiological, and imaging data, is essential to determine the appropriate surgical approach. In this case, wide en bloc resection with fibular autograft reconstruction proved successful, with no signs of recurrence at the latest follow-up in July 2023.

While established protocols exist for managing musculoskeletal oncological injuries, individualized treatment plans should be tailored to each patient's unique circumstances.

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