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CASE REPORT

Unusual Pathology Presentation, Chondroblastic Osteosarcoma of the Right Calcaneal Bone. Case Report

Presentación de patología Inusual, Osteosarcoma Condroblástico de Hueso Calcáneo Derecho. Informe de Caso

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ABSTRACT

Introduction: tumors that form in the bones of the foot are considered an uncommon or unusual finding in the medical setting. In most cases, the tumors are identified incidentally through imaging studies, and are generally classified as benign, meaning that they are not cancerous and do not pose a significant health risk. However, it is important to exercise appropriate caution, as these malignant bone tumors, which can form in the calcaneus, are particularly aggressive in nature and require specialized care. Lesions that are considered malignant tend to manifest themselves with increased frequency and, when they do, are often accompanied by symptoms such as pain and marked swelling in the affected area. Osteosarcoma is the most common primary non-hematopoietic malignant bone tumor in children and adolescents. However, it rarely occurs in the calcaneus and there are only a few case reports in the literature. The aim of the present case report is to learn about the clinical presentation of this unusual clinical and surgical pathology.
Case report: 13-year-old patient presented with mild pain in the right heel for approximately 6 months, which intensified during sports activities. Three hours ago, the patient was playing soccer and the symptomatology was exacerbated.
Conclusion: the relevance of a preliminary diagnosis and the early administration of adequate treatment for osteosarcoma in people who experience chronic pain in the heel area is of utmost importance. Furthermore, it underscores the need to consider osteosarcoma as a diagnostic possibility to be considered in adolescents suffering from chronic heel pain, even though this disease is relatively uncommon.

Keywords: Heel; Chronic Pain; Inflammation; Osteosarcoma.

RESUMEN

Introducción: los tumores que se forman en los huesos del pie son considerados un hallazgo poco común o inusual en el ámbito médico. En la mayoría de los casos, los tumores son identificados de forma incidental a través de estudios de imagen, y generalmente se clasifican como benignos, lo que significa que no son cancerosos ni representan un riesgo significativo para la salud. No obstante, es importante ejercer una

precaución adecuada, ya que estos tumores óseos malignos, que pueden formarse en el calcáneo, tienen una naturaleza particularmente agresiva que requiere atención especializada. Las lesiones que son consideradas malignas tienden a manifestarse con una mayor frecuencia y, cuando lo hacen, suelen estar acompañadas de síntomas como dolor y una notable hinchazón en la zona afectada. El osteosarcoma es el tumor óseo maligno no hematopoyético primario más frecuente en niños y adolescentes. Sin embargo, rara vez se presenta en el calcáneo y solo hay unos pocos informes de casos en la literatura.
Reporte de caso: paciente de 13 años de edad acude por presentar desde aproximadamente 6 meses dolor leve localizado en talón derecho, el mismo que se intensifica al realizar actividades deportivas. Hace 3 horas paciente se encontraba jugando futbol sintomatología se exacerba motivo por el cual acude.
Conclusión: la relevancia del diagnóstico preliminar y la administración de un tratamiento adecuado de manera temprana para el osteosarcoma en personas que experimentan dolor crónico en la zona del talón es de suma importancia. Además, se subraya la necesidad de tener en cuenta el osteosarcoma como una posibilidad diagnóstica que debe considerarse en adolescentes que sufren de dolor crónico en el talón, aunque esta enfermedad sea relativamente poco común.

Palabras clave: Talón; Dolor crónico; Inflamación; Osteosarcoma.

INTRODUCTION

Osteosarcoma is a form of cancer that affects the bones, and although it is not very common, it tends to manifest itself more frequently in adolescents as well as in young adults. This type of tumor represents the most frequent type of malignant bone neoplasm that originates primarily in the body, especially in the aforementioned age group.[1] It can appear in any bone of the human skeleton. However, it is essential to emphasize that it seems more common in the long bones of the extremities, such as the femur, the thigh bone, and the tibia, which is located in the lower part of the leg.[2] Osteosarcoma is defined as a type of tumor that originates in bone tissue, specifically characterized by the generation and development of neoplastic osteoid tissue, indicating that it is related to an abnormal process of cell growth within the bone. A primary malignant tumor that is not related to blood cell formation and that occurs in bone tissue is considered to be the most common among children and adolescents.[3]

Osteosarcoma of the calcaneus is considered a scarce variant of osteosarcoma, and curiously, it represents less than one percent of all diagnostic cases recorded in the medical literature. These types of tumors usually manifest with symptoms characterized by noticeable swelling and constant pain in the heel area.[4] Often, during the initial clinical examination, these tumors are misdiagnosed, being confused with pathological conditions that are traumatic or of inflammatory origin. Uncertainty in the diagnosis arises due to the scarcity of cases of this particular entity and the limited understanding of osteosarcomas in regions of the body that are not commonly affected by this disease. In most cases, this causes a delay in the identification of the problem and the administration of the appropriate treatment, which can have an unfavorable impact on the patient's expectations of recovery and overall prognosis.[5,6]

CASE REPORT

A 13-year-old male patient presents with pain in his right heel for approximately 6 months, which intensifies with physical activity. Three hours ago, the patient reported playing sports at school, and the symptoms are exacerbated, presenting intense pain in his right heel that is not relieved with self-medication, which is why he goes to the doctor.

The traumatology department attended the patient in the emergency service, and the relevant physical examination was carried out. Vital signs were recorded: heart rate 89 beats per minute, saturation 97% with 2% FiO2, blood pressure 115/70 mmHg, respiratory rate 20 per minute, and axillary temperature 36.5°C.

The patient is alert, hydrated, afebrile, and oriented in time, space, and person with logical reasoning, comprehension, and normal judgment. Glasgow 15/15.

Upper extremities: tone and muscle strength preserved, no edema, no tumor lesions, Daniels scale 5/5.

Left lower extremities: tone and muscle strength preserved, no edema, no tumor lesions, Daniels scale 5/5.

Right lower extremities: Pain on mobilization of the right foot is evident, and superficial and deep inflammation was detected in the heel region, which intensifies when performing physical effort on the hindfoot

Evolution We proceed to carry out complementary imaging and laboratory tests..

Magnetic resonance imaging of the right foot (calcaneus) (figure 1)

Magnetic resonance imaging identifies a solid, heterogeneous lesion, confined to the bone, with no evidence of extraosseous extension. The diagnostic impression suggests the possibility of lymphoma or sarcoma. A histological procedure is performed to confirm the diagnosis (figure 2).

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Table 1. Blood Biometrics		
White Blood Cells	8135 mm3	4400 - 11300
Neutrophils	7570 mm3	2000-8000
Lymphocytes	3600 mm3	1000-4400
Monocytes	246 mm3	80 - 880
Eosinophils	90 mm3	80 - 440
Basophils	56 mm3	0 - 110
Neutrophils %	90,2 %	50,0 - 70,0
Lymphocytes %	8,8 %	
Monocytes %	5,4 %	2,0 - 11,0
Eosinophils %	2,4 %	1,0 - 3,0
Basophils %	0,5 %	0,0 - 2,0
Red Blood Cell Count	4920 10/mm3	4000-5400
Hemoglobin	13,2 g/dL	12,0 - 15,00
Hematocrit	38,4 %	35,0 - 49,0
Mean Corpuscular Volume	76,5 fL	76,0 - 95,0
Mean Corpuscular Hb	27,5 pg	26,0 - 32,00
Platelets	485 k/uL	130,0 - 400,0

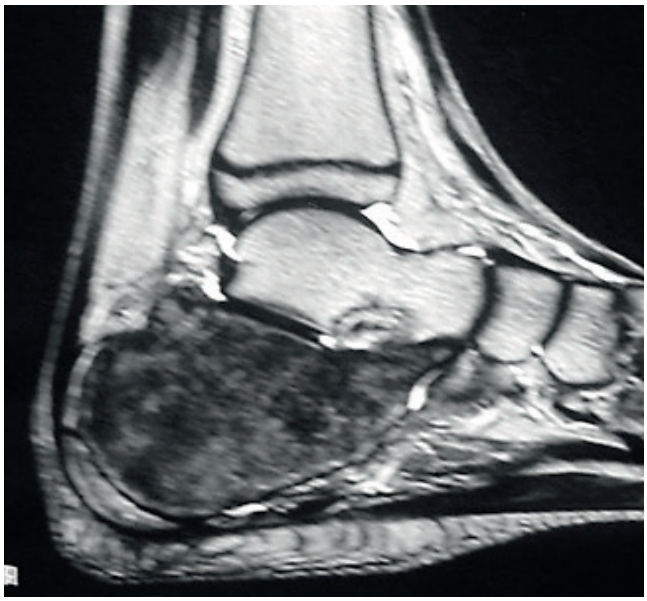

Figure 1. Magnetic resonance of right calcaneus

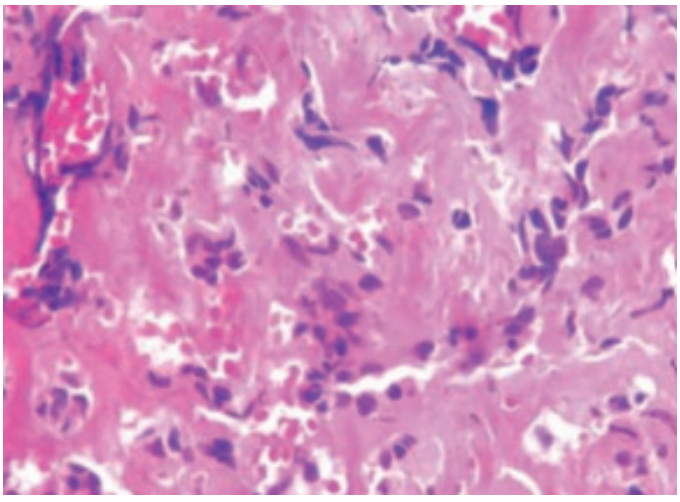

Figure 2. Biopsy showing diagnosis of chondroblastic osteosarcoma

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Emergency surgery is then performed to remove the bone with osteosarcoma and limit clean edges plus a calcaneal prosthesis (figure 3).

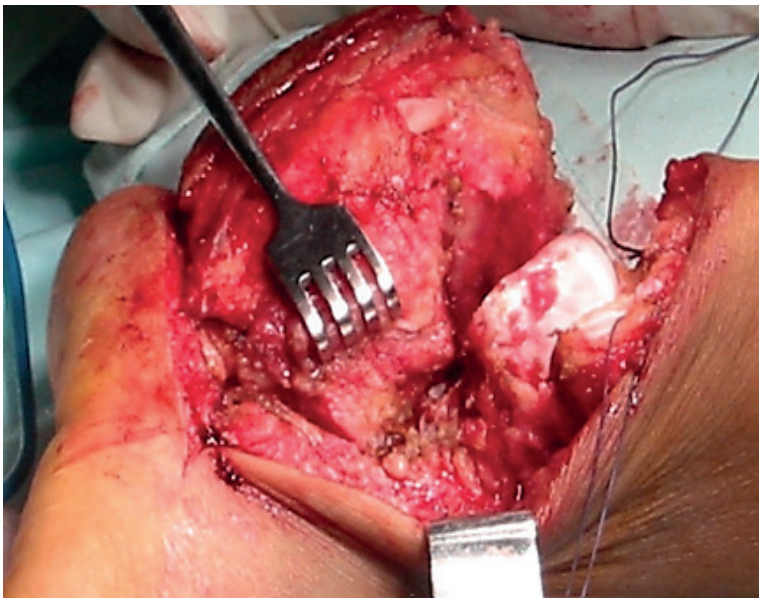

Figure 3. Osteosarcoma resection

Patient after surgery receives chemotherapy treatment

DISCUSSION

Osteosarcoma is classified as the most common primary malignant neoplasm unrelated to the hematopoietic system in bones, especially in the child and adolescent populations. Despite its prevalence in this age group, it is essential to note that this form of cancer accounts for just under 1% of all cancer diagnoses made in general. The majority of cases of osteosarcoma, which is a type of bone cancer, tend to manifest during adolescence. In addition, it is notable that there is a predominance in the incidence of this disease in males, which is observed in all age groups.[7,8]

The World Health Organization (WHO) categorizes the different types of bone tumors into several classifications, including the conventional type subdivided into osteoblastic, chondroblastic, and fibroblastic. In addition, other types are identified, such as telangiectatic, small cell, low-grade central, secondary, periosteal, and parosteal, with the conventional type being considered the most frequent of all. The various treatment alternatives and the expected outcomes for the different osteosarcoma types vary significantly.[9]

Accurate diagnosis identification and exhaustive evaluation of the magnitude of the problem are fundamentally important. To carry out this task, it is essential to perform a careful evaluation using imaging techniques, with magnetic resonance being one of the most outstanding tools in this process.[10]

Osteosarcoma, a type of malignant tumor originating in the bones, specifically in the bones of the foot, is considered the least frequent type of osteosarcoma. This type of cancer represents only 1% of all diagnosed cases of osteosarcoma in general.[11,12] Of all those rare cases affecting the foot bones, approximately 75% develop from the calcaneus, the heel bone, or the metatarsal bones, which are the bones found in the middle part of the foot. Osteosarcomas affecting the foot have mostly been reported in adults. However, as is the case with our patient, only a small number of cases of osteosarcoma involving the calcaneus have been documented in children and adolescents.[13]

The signs and manifestations of the disease are not unique or specific, which often leads to delays in the diagnosis process. The most common signs of this condition include pain experienced when trying to walk and noticeable swelling in the foot. Among the various situations that can manifest in children and cause symptoms such as pain and inflammation in the heel area, the most common are the calcaneal apophysis, which is an inflammation in the growth area of the heel bone, as well as the presence of a foreign body that has become trapped in that region.[14] In rare situations, fractures and tumors in the calcaneus may be detected, which is an essential component of the foot.

The pain and inflammation caused by osteosarcoma, an aggressive form of bone cancer, may experience temporary improvement with a conservative treatment approach. However, this improvement can lead to diagnostic confusion, which in turn causes a significant delay in implementing adequate and necessary treatment to address the disease effectively.

The therapeutic approach used to treat bone sarcomas can vary considerably depending on the specific stage of the disease. The therapeutic approach considered the standard for the management of patients suffering from conventional osteosarcoma involves the use of a strategy that combines both chemotherapy and surgical procedures.[15,16] In general terms, it is possible to perform limb-saving surgery in most cases of bone sarcomas affecting the long bones of the human body. However, osteosarcoma in the foot can rarely be treated by surgery to save the affected limb. This is due to the complex and deficient compartmentalization of the tumor in the foot region, which leads to its eventual invasion and extension into the adjacent foot compartments. This situation was evident in our patient's case. Consequently, amputation surgery below the knee is frequently the treatment option chosen, as in most cases, it is observed to produce entirely satisfactory results.[16]

Although the literature refers to the possibility of performing a limb amputation, in the case of our patient, it was decided to carry out a surgical intervention aimed at a total resection, but only of the damaged area. It is important to point out that during this procedure, only the damaged calcaneus was removed, achieving a result that is considered satisfactory and beneficial for the patient's well-being.

CONCLUSION

Tumors that develop in the foot bones are anomalies that occur infrequently in medical practice. In most cases, the tumors are discovered incidentally during medical imaging studies; fortunately, the vast majority of them turn out benign. However, it is essential to exercise caution, given that the inherently aggressive nature of malignant bone tumors can manifest itself in the calcaneal area, which could represent a serious health risk.

Malignant lesions manifest themselves with a notably elevated frequency, generally accompanied by symptoms such as intense pain and notable swelling in the affected area. These conditions are often misidentified as soft tissue injuries, which highlights the crucial importance of making an accurate diagnosis and providing appropriate treatment for these injuries at an early stage. Imaging plays a fundamental and highly relevant role in the context of simple X-rays and the use of advanced imaging, as they are essential tools in medical diagnosis and evaluation. The surgical procedures can be presented in a wide range, ranging from less invasive techniques, such as curettage with grafting, to more drastic interventions, such as amputation, which are considered necessary when the lesions are more aggressive and severe.

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CONSENT

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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