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CASE REPORT

Solitary spinal osteochondroma in childhood. Case report

Osteocondroma espinal solitario en la infancia. Informe de caso

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ABSTRACT

Introduction: Osteochondroma is the most common benign bone tumor in children. These are benign cartilage-forming lesions. Spinal involvement is rare, and even more so in the solitary form, representing 1 to 4 % of lesions. The overlapping course of its symptoms and signs delays diagnosis. Vertebral bone x-rays and soft tissue ultrasound are useful studies to corroborate suspicion. Other methods such as computed axial tomography and magnetic resonance imaging allow assessment of canal and neuroradicular involvement. This allows for early treatment and prevents deformities or permanent neurological damage.
Objective: to present a pediatric case of solitary spinal osteochondroma in which imaging studies were very useful for the diagnosis, corroborated by histopathological examination of the lesion.
Case report: a 7-year-old female patient presented clinically with an increase in lumbar spine volume over the past year. Imaging studies such as ultrasound, lumbosacral X-ray, and computed tomography (CT) scan were used to diagnose the condition, which was confirmed by histopathological examination of the lesion following surgery. The patient's progress was satisfactory.
Conclusions: diagnostic imaging techniques are a valuable tool in our field, allowing us to identify vertebral osteochondromas, correlating them with the clinical presentation, and providing appropriate patient management, as was the case in this case.

Keywords: Osteochondroma; Tomography; Magnetic Resonance Imaging.

RESUMEN

Introducción: entre los tumores óseos benignos en edad pediátrica el osteocondroma es el más frecuente. Son lesiones benignas formadoras de cartílago. El compromiso espinal es raro, y más aún en la forma solitaria, representando del 1 al 4 % de las lesiones. El curso solapado de sus síntomas y signos, retardan diagnóstico. Las radiografías de los huesos vertebrales y el ultrasonido de partes blandas son estudios útiles para corroborar la sospecha. Otros métodos como la tomografía axial computarizada y la resonancia magnética permiten valorar el compromiso del canal y neuroradicular. De esta manera se logra un tratamiento temprano y evitar las deformaciones o el daño neurológico permanente.
Objetivo: presentar un caso pediátrico con osteocondroma solitario espinal donde los estudios de imágenes resultaron de gran utilidad para el diagnóstico corroborado mediante estudio histopatológico de la lesión.
Reporte de caso: paciente femenina, de 7 años de edad, que se manifestó clínicamente con un aumento de volumen en la región lumbar, de un año de evolución. A través de los estudios de imágenes como ecografía, radiografía lumbosacra y tomografía axial computarizada se hizo el diagnóstico imagenológico, que se confirmó con el estudio histopatológico de la lesión posterior a su intervención quirúrgica. La evolución de

la paciente fue satisfactoria.
Conclusiones: las técnicas de imágenes diagnósticas resultan un aporte valioso a nuestro alcance que permite identificar los osteocondromas vertebrales, correlacionándolas con la presentación clínica, y brindar el manejo apropiado del paciente como sucedió en el caso que se presenta.

Palabras clave: Osteocondroma; Tomografía; Resonancia Magnética.

INTRODUCTION

Although bone tumors have been documented since ancient times, it was not until the early 19th century that they became the subject of genuine scientific interest. The influence of one of the great anatomists of the last century, John Hunter, led his student, John Abernethy, to create the first classification of tumors based on their pathological anatomy. Later, Henry Jaffe (1896-1979), considered the great pathologist of the century, named and characterized many of the existing entities.[1]

Bone tumors have characteristic ages of presentation, locations, and radiological images. Certain types of bone tumors are more common in the pediatric population, while others are more common in the mature skeletal population and still others in the elderly population.[2]

Primary spinal tumors in childhood are uncommon. The overlapping course of their symptoms and signs explains the delay in diagnosis. Timely diagnosis and early treatment prevent deformities and permanent neurological damage.[3] Among benign bone tumors in children, osteochondroma is the most common. It was first described in 1818 by Astley Cooper.[2,4] These are cartilage-forming lesions that grow from the plate where endochondral growth takes place. According to the World Health Organization, it is an osteochondral exostosis with continuity to the cortical and medullary region, considered a developmental disorder rather than an actual tumor.[5]

Its main symptoms and signs are pain, swelling, and growth disorders. They are often located in the metaphyseal areas around the knee. They can be single or multiple. According to Enneking, the biological behavior of this tumor can be latent or active, as the aggressive form is rare in children.[3]

In general, a diagnosis can be made based on the characteristics of the tumor using an X-ray. However, other imaging methods, such as ultrasound, CT, and especially MRI, can be helpful in doubtful cases, particularly when symptomatic lesions appear or in unusual locations. Computed tomography and magnetic resonance imaging allow for the assessment of canal and neuroradicular involvement.[5]

The purpose of this article is to present a pediatric case with a solitary spinal osteochondroma in which imaging studies were beneficial for the diagnosis, which was corroborated by histopathological examination of the lesion.

CASE REPORT

This is a 7-year-old female patient who began to present with an increase in volume in the lumbar region, which had been evolving for a year, with no history of trauma. She attended a specialized echoscopy consultation at the José Luis Miranda Provincial Pediatric University Hospital in Villa Clara, where her mother reported her concern that it had become more noticeable in recent months. Physical examination revealed a 3 cm long, soft, painless paravertebral mass on the left side, which adhered to the deep planes. No distal neurovascular alterations or functional impairment of the lower limb were found.

A soft tissue ultrasound was performed (figure 1), which showed the palpated mass and, immediately below the muscle plane, a marked irregularity caused by an area of bony excrescence.

A reevaluation with anteroposterior and lateral X-rays of the lumbosacral spine was suggested (figure 2), which showed a radiopaque tumor adjacent to the laminae and left articular processes of the L1 and L2 vertebral bodies, related to bone exostosis, with a probable diagnosis of osteochondroma.

To confirm the involvement of the canal and neuroradicular, other studies were performed, such as a simple lumbar spine CT scan (figure 3), which showed a tumor with a density of 300 HU originating from the lamina and left interfacet joint of L1 and L2, with irregular contours in the form of a bony excrescence without invasion of the spinal canal or muscle planes.

The patient underwent surgery. The exostosis was resected with a fine osteotome and Kerrison forceps, removing all the material. The biopsy report states: Bone consisting of mature cancellous bone covered by a cartilaginous layer of variable thickness with proliferating cell foci with small single nuclei compatible with osteochondroma. The patient is making progress with improvement and is recovering almost immediately after surgery.

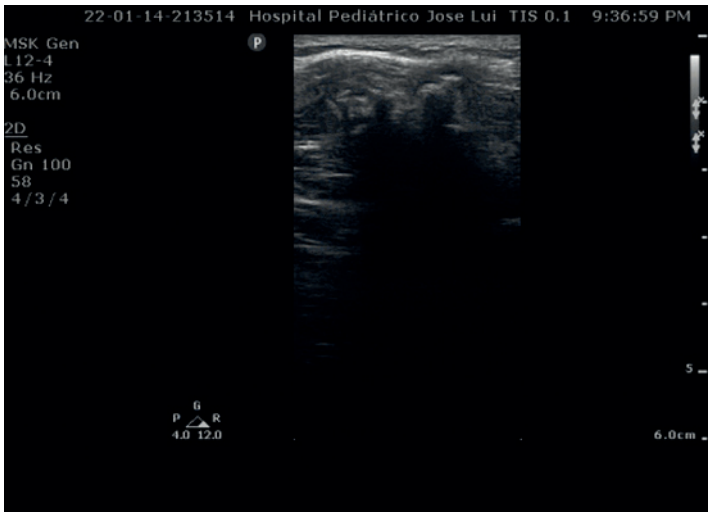

Figure 1. Area of bone excrescence immediately below the muscle plane.

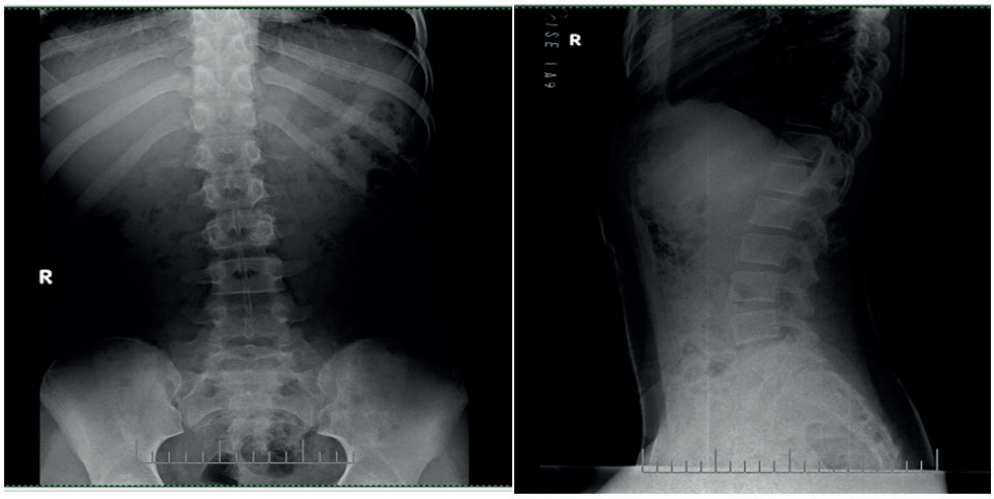

Figure 2. Radiopaque tumor adjacent to the laminae and articular facets of the L1 and L2 vertebral bodies

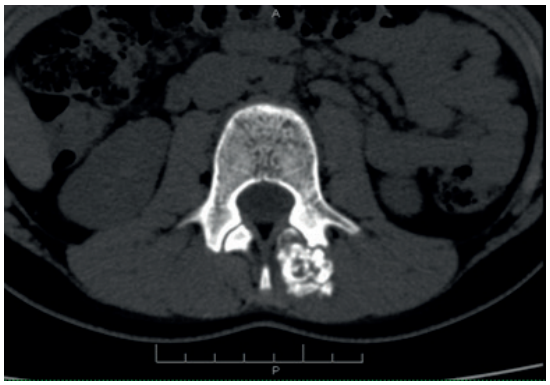

Figure 3. Axial CT scan showing an osteocartilaginous tumor of the left interfacet joint of L1 and L2

DISCUSSION

More than 50 % of osteochondromas occur in patients under the age of 20. Their growth is usually related to bone development, beginning in early childhood and continuing until puberty. These characteristics are similar to those presented in the current case.

Osteochondromas manifest in two different patterns: as a solitary or sporadic lesion without a genetic component, or as multiple lesions (multiple hereditary exostosis). Spinal involvement is rare, especially in the solitary form, accounting for 1 % to 4 % of lesions. In the hereditary form, spinal involvement is more common, occurring in 7 % of cases. When they happen in the spine, they are most common in the cervical spine and rare in the lumbar spine. They can originate from any point on the vertebral body, lamina, pedicle, spinous

processes, or transverse processes. The case presented here involves a single lesion in an unusual location, the lumbar spine.

Neurological symptoms are exceptional. They are rarely symptomatic before adolescence, with a higher incidence between the second and third decades of life. However, they can cause radicular symptoms if located near neurological structures, causing irritation and spinal compression, which is rare but potentially catastrophic. Although no neurological symptoms were present, the presentation in early childhood with a marked increase in volume is fascinating. There is no difference between sexes in the solitary form, while in the multiple forms, there is a clear male preponderance.[6,7]

The risk of malignant degeneration of an osteochondroma is approximately 1 % to peripheral or secondary chondrosarcoma. A rapid increase in the size of the lesion, recurrence after excision, growth after skeletal maturation, or a cartilage layer greater than 3 cm should make us suspect this phenomenon.[6] None of these aspects was demonstrated in the imaging studies performed.

The hyaline cartilage layer can be visualized on radiographs as areas of semicolon calcifications, but in cases with no mineralization, other imaging methods may be necessary. Ultrasound enables the visualization of the cartilage layer, which appears as a hypoechoic area on the cortical bone being examined. However, it is more helpful in studying complications such as aneurysms, thrombosis, or bursitis.

The pathognomonic features of exostoses on CT are the presence of sessile or pedunculated tumors. It can be helpful in areas of complex anatomy, such as the bones of the spine, shoulder, or pelvis. In the spine, there is continuity between the cortical and cancellous tissue of the vertebral body from which they originate. Spinal exostoses are better visualized with CT than with MRI, due to the characteristics of the lesion. However, some authors consider that this imaging method may not be suitable for measuring the thickness of the cartilaginous layer, a crucial criterion for differentiating it from malignant varieties.[8]

In patients with radiculopathies, MRI is recommended to observe the level and extent of neurological compression, as well as the corticomedullary continuity of lesions in complex areas. This shows a prominent hypointense peripheral border in all pulse sequences, corresponding to ossification, and a small central nucleus isointense to the bone marrow. The marrow maintains a yellow marrow signal, giving a “bull’s-eye” appearance.[8]

In addition, MRI is considered the best method for visualizing the structures surrounding the lesion, its effect on them (vascular and nerve compromise), complication data (pseudoaneurysms, edema), and the non-mineralized cartilage layer, which shows a high signal on T1 and high on T2, due to its water content, allowing these characteristics to be used to measure its thickness accurately. It should be noted that the presence of edema is a sign of complication and could indicate the presence of chondrosarcoma.[9,10]

In the presented case, the nature of the tumor is well identified thanks to imaging studies, and the location and characteristics of the lesion allow for a suspected diagnosis.

Differential diagnoses in this case include chondrosarcoma, osteoblastoma, and connective tissue pathologies such as dermatomyositis and heterotopic ossification.

These lesions are managed by surgical resection if they present symptoms, as in the case shown. Recurrence of the condition after surgical treatment is rare and typically results from incomplete resection of the lesion.

CONCLUSIONS

Osteochondromas are rare tumors in the spine, although osteochondroma is the most common benign bone tumor in children. The diagnosis in this clinical case was made through imaging studies and confirmed by histopathological examination of the lesion. Having a suspected diagnosis and the valuable contribution of imaging studies at our disposal allows us to provide appropriate management of the patient, as was the case in the case we present.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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