Case Resolution

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Lesión endomedular inusual en la falange distal del hallux

RESUMEN
Las lesiones óseas ocupantes de espacio de localización endomedular y excéntricas en huesos cortos del pie son infrecuentes, hay escasos reportes de caso y, hasta hoy, no se han descrito en la falange distal del hallux. Presentamos uno de estos casos, las evaluaciones clínica y radiológica, y el abordaje terapéutico.
Palabras clave: Neoplasia; localización excéntrica; atípica; endomedular; hallux.
Nivel de Evidencia: IV

Unusual Intramedullary Lesion in the Distal Phalanx of the Hallux

ABSTRACT
Intramedullary, eccentrically located space-occupying bone lesions in the short bones of the foot are uncommon. Few cases have been reported in the literature, and to date, such lesions have not been described in the distal phalanx of the hallux. We present one such case, including its clinical and radiological evaluation and therapeutic management.
Keywords: Neoplasm; eccentric location; atypical; intramedullary; hallux.
Level of Evidence: IV

DIAGNOSIS

Enchondroma of the distal phalanx of the hallux.

DISCUSSION

The patient provided informed consent for surgery. In the operating room, prophylactic intravenous antibiotics were administered, and a toe tourniquet was applied for 45 minutes. Through an oblique incision in the lateral eponychium over the distal phalanx of the right hallux, the nail plate and nail bed were elevated, the lesion was identified in the central proximal metaphyseal-diaphyseal region of the phalanx, and curettage was performed with an osteotome, allowing removal of the lesion, which had a gritty, whitish, opaque appearance, with intramedullary involvement and lateral cortical destruction. The lesion was completely excised and submitted for histopathological examination. A residual bone defect involving less than 30% of the diameter of the distal phalanx remained. The bone cavity was irrigated with a 5% dextrose solution. A second incision was made over the lateral aspect of the ipsilateral heel to harvest a corticocancellous calcaneal bone graft, which was placed into the residual cavitary defect of the distal phalanx of the hallux. The wounds were closed in layers, and the limb was immobilized with a below-knee plaster splint.

The patient was discharged with analgesics and instructed to bear weight on the heel only. An outpatient follow-up visit was scheduled once the biopsy results became available.

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Histopathological examination revealed a lesion composed of hyaline cartilage, with no areas of necrosis, no chondrocyte atypia, and no myxoid change, forming well-defined cartilaginous nodules. Most importantly, no permeative growth pattern was identified (Figure 3).

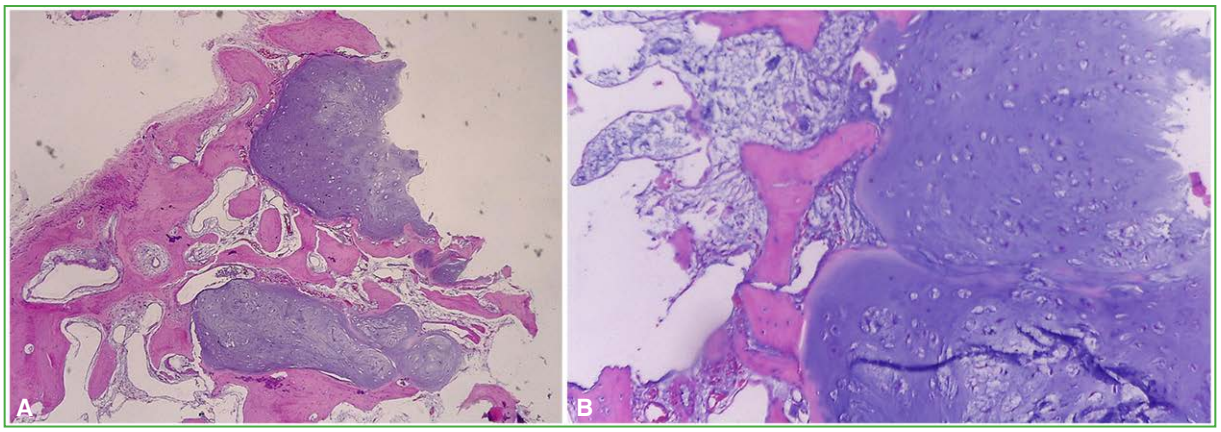

Figure 3. Well-defined nodules of hyaline cartilage, some eccentrically located, with no permeative growth pattern within the intertrabecular spaces. Hematoxylin and eosin stain; original magnification x4 (**A**) and x10 (**B**).

After 4 months of clinical follow-up, the patient reported no pain or mechanical discomfort while wearing shoes, with only residual nail discoloration. Radiographically, advanced bone healing was observed, with no evidence of recurrence (Figures 4 and 5).

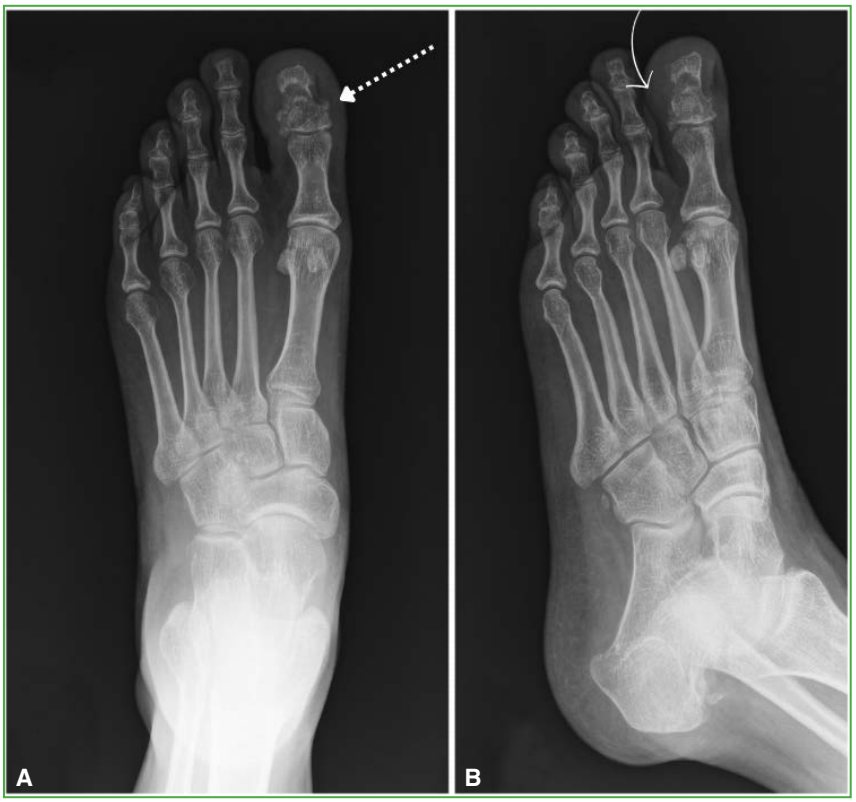

Figure 4. Radiographs of the right foot. **A.** Anteroposterior view. Advanced bone healing (dotted white arrow). **B.** Oblique view. No evidence of tumor recurrence (curved white arrow).

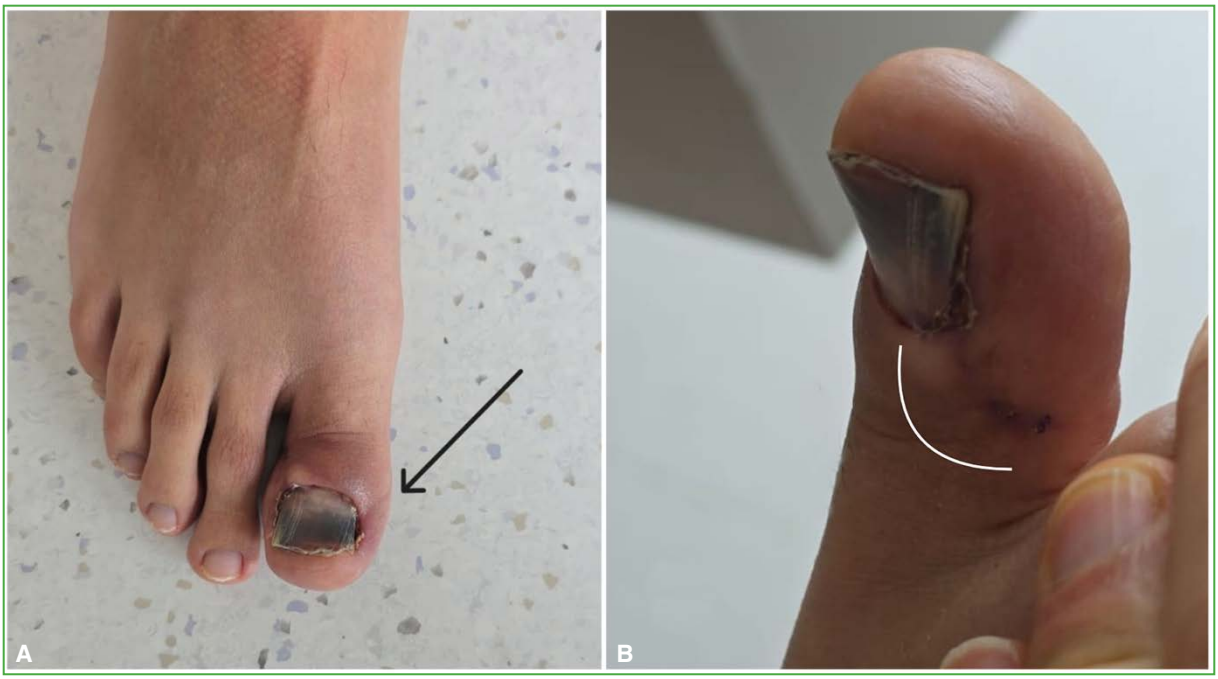

Figure 5. A. Clinical photograph of the right foot showing residual nail dystrophy of the hallux (black arrow). **B.** Healed surgical incision (curved white line).

Bone tumors of the foot and ankle are rare entities, accounting for only 5-10% of all musculoskeletal tumors.[1] Enchondroma is a benign neoplasm located within the medullary cavity that, when occurring in the foot, most commonly involves the metatarsals and phalanges; in 80% of cases, the proximal phalanx is the most frequent location. It is generally asymptomatic but may cause pain and swelling secondary to pressure from its intracavitary expansion or to a pathological fracture. Lesions range from 5 mm to 18.7 mm in size and are usually solitary; when multiple lesions are present, the condition is termed enchondromatosis or Ollier disease. When enchondromatosis is associated with soft-tissue hemangiomas, it is known as Maffucci syndrome.[2]

Histologically, enchondromas are composed of nodules of hyaline cartilage within the medullary cavity, often with peripheral endochondral ossification. The nuclei are round and hyperchromatic, and mitotic activity is absent. Enchondromas of the small bones of the hands and feet may exhibit increased cellularity and mild cytological atypia. Furthermore, when these cartilaginous nodules are eccentrically located, they may thin the cortex and even breach it, producing periosteal bulging. Although such findings may raise suspicion of malignancy, they are still considered features of benign lesions. Therefore, correlation of the clinical presentation, duration of symptoms, imaging findings, and histological features is essential, making the diagnosis frequently challenging.[3,4]

On radiographs, enchondroma appears as a well-defined, expansile, lytic lesion located centrally in the diaphysis or metaphyseal-diaphyseal region. Computed tomography may demonstrate characteristic intralesional calcification patterns and allows assessment of cortical integrity. Magnetic resonance imaging may reveal bone and soft-tissue edema, together with low-to-intermediate signal intensity on T1-weighted images, characteristic of cartilaginous tumors, and high signal intensity on T2-weighted images. Contrast-enhanced MRI readily demonstrates peripheral enhancement and internal septations.[5]

Malignant transformation of a solitary lesion in the foot and ankle is exceedingly rare. The risk may reach 5% in large lesions of the distal tibia and up to 20% in patients with Ollier disease or Maffucci syndrome. Conversely, secondary malignant lesions of the foot and ankle are extremely uncommon, accounting for only 1% of cases, and typically occur in advanced lung, breast, or endometrial cancer.[6]

Only isolated case reports have been published. One described a 16-year-old patient with a lesion of the proximal phalanx of the second toe that had been present for 10 years and became symptomatic 3 months before undergoing intralesional resection and bone grafting.[7] Similarly, a 27-year-old patient with a 4-month history of pain and a mass involving the proximal phalanx of the fourth toe underwent local resection, bone grafting, and Kirschner wire stabilization because of the size of the residual defect after resection.[8] In both cases, no recurrences were reported, and the patients remained asymptomatic throughout follow-up.

For solitary lesions, intralesional resection, bone grafting, and, in selected cases, temporary stabilization with a Kirschner wire are established as the most effective treatment for symptomatic lesions that fail conservative management or are associated with pathological fractures.[9]

In the present case, an open resection technique through a direct approach to the lesion is described. However, minimally invasive and endoscopic techniques have also been reported for resection of enchondromatous lesions and placement of a bone graft into the residual defect.[10] To date, no comparative studies have evaluated the outcomes of these techniques; therefore, both remain valid options for the management of these intraosseous lesions.

CONCLUSIONS

Solitary lytic lesions of the toe phalanges are uncommon and generally benign, but they may cause pain, local deformity, and pathological fracture. Imaging evaluation is recommended, together with resection, biopsy, and, in selected cases, stabilization with a Kirschner wire.

Conflicts of interest: The authors declare no conflicts of interest.

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