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Case report

Periosteal chondroma of the cuboid with secondary aneurysmal bone cyst in a setting of secondary hyperparathyroidism

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ABSTRACT

We report the case of a 35-year-old woman with painful, nontender mass at the right lateral hindfoot. Computed tomography (CT) and magnetic resonance imaging (MRI) indicated the suspect of a chondroid tumour in the cuboid. The tumour was resected en bloc and histology revealed the presence of a periosteal (juxtacortical) chondroma with secondary aneurysmal bone cyst. Secondary hyperparathyroidism was detected in laboratory tests and put into context with the histopathologic findings. In conclusion, a rare case of periosteal chondroma of the cuboid with secondary aneurysmal bone cyst in a setting of secondary hyperparathyroidism due to vitamin D deficiency is presented.

Level of clinical evidence: 4.

1. Introduction

Periosteal chondroma is a rare, benign chondroid tumour of usually <3 cm that is mostly found in young adults and in the tubular bones, particularly the humerus, hand and femur [1–4]. Its discrimination from malignant chondroid lesions using available imaging techniques might be challenging, however, especially the size of the lesion was found to be an indicator in distinguishing the different entities [5]. Besides its typical localizations mentioned above, it has been reported in various skeletal regions like the tibia [6], spine [7] and the rib [8]. Interestingly, we are aware of only a single case of periosteal chondroma located in the cuboid of a 7-year-old boy [9].

Herein we present an unusual case of a periosteal chondroma with development of a secondary aneurysmal bone cyst in a patient with a secondary hyperparathyroidism, which was diagnosed in a close cooperation of the radiologist, orthopedic surgeon and pathologist.

2. Case report

A 35-year-old female patient presented at our outpatient clinic with a history of pain in the right foot that she had for 1.5 years. There was no history of trauma. Clinical examination revealed a firm, nontender mass at the lateral hindfoot that was pressure sensitive and painful in supination as well. Further medical history was inconspicuous.

Computed tomography (CT) revealed a cystic, multi-chambered lesion of 20 × 15 × 20 mm with calcifications and a thin sclerotic rim in the lateral aspect of the cuboid, that was suspected to be of chondroid origin (Fig. 1A, B). Differential diagnoses comprised both benign and malignant chondroid tumours as well as aneurysmal bone cyst. Additional magnetic resonance imaging (MRI) pointed to a periosteal lesion with intermediate signal intensity on T1-weighted and high signal intensity on T2- and proton density (PD)-weighted sequences and no fluid levels. There was a surrounding affection of the fifth metatarsal bone, as well as extensive muscle and soft tissue calcification (Fig. 1C, D). In available MRI scans from 13 years prior to the presentation at our clinic, the tumour could already be identified, however, substantially smaller and without surrounding calcification or periosteal reaction (Fig. 2).

A moderate secondary hyperparathyroidism (parathyroid hormone: 90.9 ng/ml; reference range 17–84 ng/ml) due to vitamin D insufficiency (25-hydroxyvitamin D 25.1 μg/l) was found in the blood tests and was normalized by a supplementation of 20,000 IE vitamin D, weekly. Bone formation (i.e., alkaline phosphatase,

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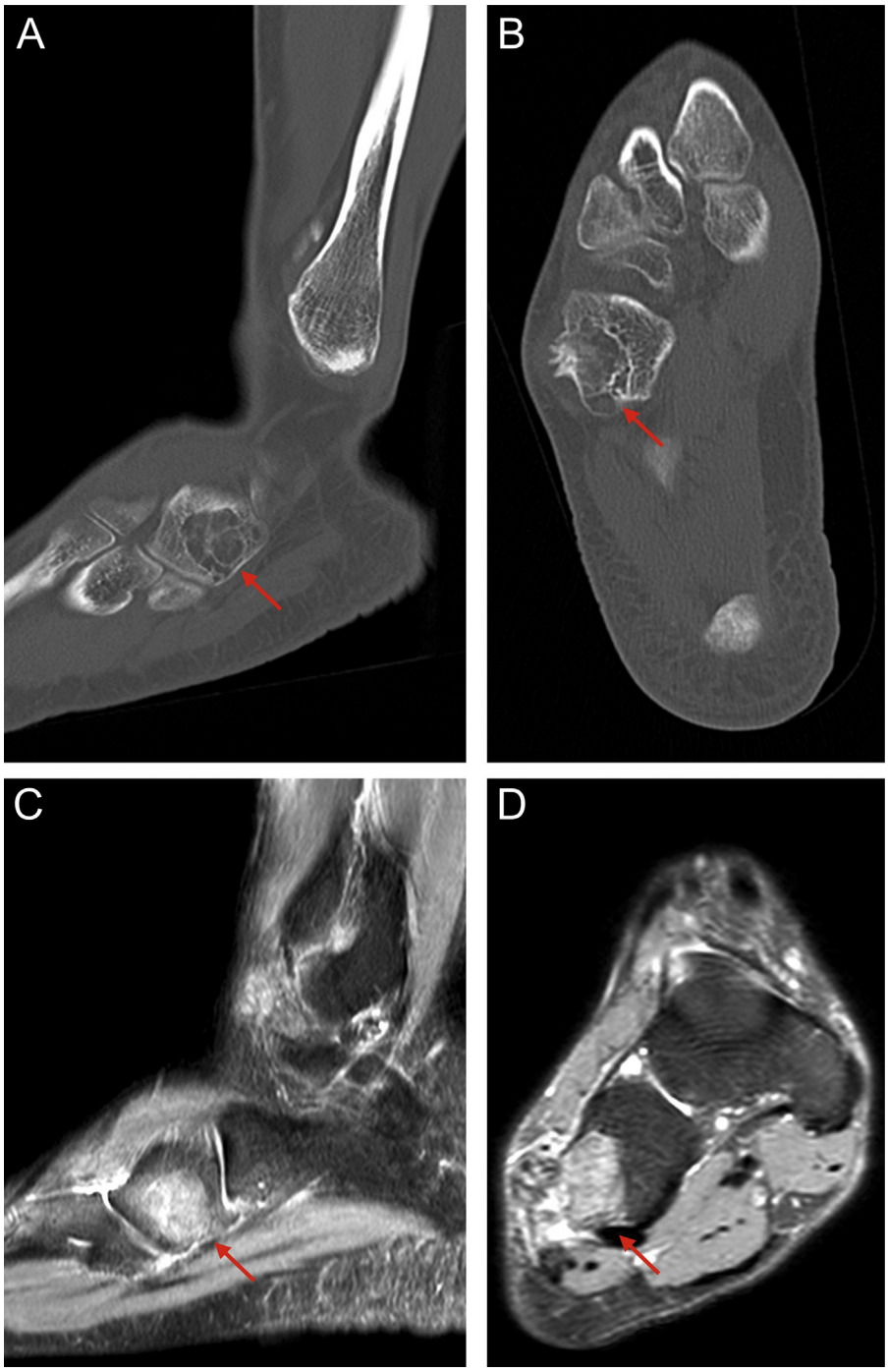

Fig. 1. Imaging characteristics of the periosteal chondroma. (A) A sagittal reformat of a CT scan showed the cystic chondroid lesion with scattered ossification in the cuboid (red arrow). (B) In the transverse reformat, a mushroom shaped prominence reaching into the soft tissue was seen. (C, D) Corresponding sagittal and coronal fat suppressed (FS), proton density (PD) weighted, turbo spin echo (TSE) MRI images showing the hyperintense lesion with surrounding soft tissue calcification.

osteocalcin) and resorption markers (i.e., deoxypyridinoline in the urine) were within normal range.

After careful assessment in a multidisciplinary team (MDT), the patient was referred to a specialist foot surgeon, and the tumour was surgically removed under general anesthesia. A longitudinal incision lateral of the palpable tumour of the cuboid was made from the anterior process of the calcaneus until the base of the fifth metatarsal bone. Subsequently, the sural nerve was exposed and the peroneus brevis tendon running into the tumour was resected with a safety margin of 1 cm from the tumour. The surgical procedure further included a partial resection of the extensor digitorum brevis muscle, plantar fascia, as well as the base of the fifth metatarsal bone. The tumour was resected en bloc with the detached soft tissues; and the cuboid was additionally curetted using a sharp curette. The articular surface towards the calcaneus remained intact. Finally, a tendon transposition of the peroneus brevis to peroneus longus tendon was conducted. The tissues were fixed in buffered formalin immediately after the resection and sent to a histopathology laboratory.

The bone tissue was decalcified with EDTA and embedded in a paraffine wax. Hematoxylin and eosin (H&E) staining of the slides revealed a periosteal (juxtacortical) cartilaginous proliferation

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