



ICONOGRAPHIC REVIEW / *Musculoskeletal imaging*

Non-traumatic calcifications/ossifications of the bone surface and soft tissues of the wrist, hand and fingers: A diagnostic approach



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KEYWORDS

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Abstract In the absence of obvious trauma, the calcifications/ossifications of the bone surface and soft tissues of the wrist, hand and fingers can be challenging and may not be noticed or lead to unnecessary examinations and monitoring. Although these are usually benign conditions and despite a favorable spontaneous outcome, surgical resection may be required and recurrence may occur. In practice, only paraneoplastic syndromes such as secondary hypertrophic osteoarthropathy (Pierre Marie-Bamberger syndrome) may reveal a malignant tumor, most often pulmonary. We suggest a diagnostic approach based on the initial clinical presentation (acute pain, chronic pain, growth ± pain) and the radiological features.

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Calcifications and ossifications that develop on the surface of bone and in the soft tissue of the wrist, hand and fingers are usually benign. In practice, only paraneoplastic syndromes such as Pierre-Marie-Bamberger syndrome may reveal a malignant tumor that is usually pulmonary and cyanotic. Primary malignant tumors in the soft or paraosteal tissues are rare in the wrist, hand and fingers. Acral metastases are rare and usually develop in advanced, previously diagnosed tumoral diseases.

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The morphological features of these calcifications are less discriminant than the underlying anatomical structure where they are located, an anatomical structure that is not specific for the causative agent. The clinical features (slow growing, swelling, acute or chronic pain) are essential diagnostic criteria (Table 1) to help determine the location and morphology of these calcifications or ossifications. In the absence of any obvious trauma, and because of the many different possible benign conditions, it is important to help the clinician define those that may require surgical management (osteochondromatosis, Nora’s lesion, vascular malformation, calcifying aponeurotic fibroma), those that may reveal a metabolic disorder or a systemic disease (calcium pyrophosphate dihydrate crystal deposition disease (CPPD), gout, kidney failure, connective tissue disease, psoriatic arthritis) and those that can be treated symptomatically (hydroxyapatite crystal deposits, tendinosis).

Context of non-traumatic acute pain

Hydroxyapatite crystal deposits

Hydroxyapatite is one of the most stable forms of basic calcium phosphates (Fig. 1). It is naturally present in bone, enamel and dentin, where it is the main mineral component. An acute and solitary periarticular, peritendinous or intra-articular hydroxyapatite deposit may occur, possibly due to

Table 1 Diagnostic table of calcifications of the soft tissues and the surface of the bones of the wrist, hand and fingers in relation to the initial clinical presentation.

<i>Acute non-traumatic pain</i>
Hydroxyapatite deposit
Florid periostitis - Nora’s lesion - Turret exostosis
Myositis ossificans circumscripta
<i>Chronic pain</i>
Tendinosis – Mechanical enthesopathy
Psoriatic arthritis
Osteochondromatosis
Calcium pyrophosphate dihydrate crystal deposition disease (CPPD)
Gout
Connectivitis (Scleroderma/CREST - Dermatomyositis)
Chronic renal failure
Pierre Marie-Bamberger syndrome
<i>Swelling ± pain</i>
Chondroma
Vascular malformation
Calcifying aponeurotic fibroma

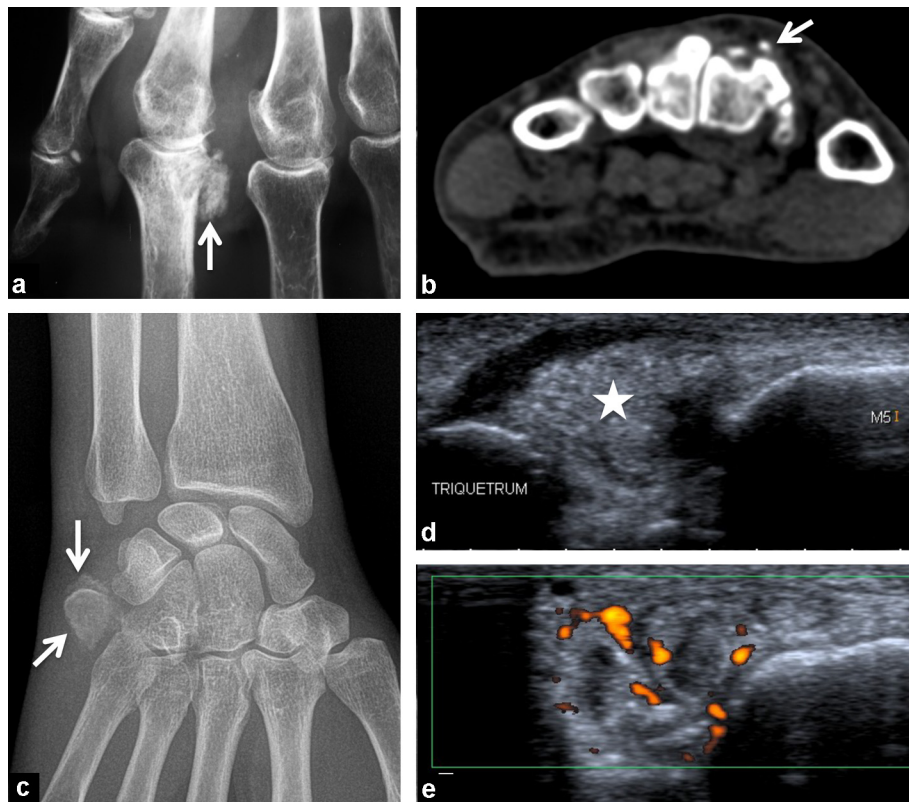


Figure 1. Acute deposits of hydroxyapatite crystals in the soft tissues of three different patients: on conventional radiography at the base of P1 of the 2nd ray (arrow) (A), on axial CT scan at the distal insertion of the extensor carpi radialis longus muscle on the 2nd metacarpal base (arrow) (B), on conventional radiography (arrows) (C), ultrasound (D) and Doppler ultrasound near the triquetral bone and the distal insertion of the extensor carpi ulnaris (E). Note on ultrasound the echogenic mass with the calcium spots and no posterior shadow cone (D-star) and the Doppler hyperhemia consistent with the local inflammation (E).

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