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Clinical vignette

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Dual-energy computed tomography molecular imaging of pigmented villonodular synovitis

A 35-year-old woman presented with a 1 year history of non-traumatic gradual swelling of the first ray of the left foot, which had been painful for several weeks. Physical examination revealed a firm, slightly tender mass in the medial plantar soft tissues. Laboratory investigations, including levels of uric acid and CRP, were normal. Radiographs showed a soft tissue mass without calcification or involvement of bones and joints. The patient underwent dual-energy CT (DECT) for further evaluation. Spectral analysis with two-material decomposition demonstrated an X-ray attenuation characteristic of iron within the distal synovial sheath of the flexor hallucis longus tendon (Fig. 1A and B), consistent with localized pigmented nodular tenosynovitis. The diagnosis was subsequently confirmed by percutaneous core needle biopsy (Fig. 1C).

Pigmented villonodular synovitis (PVNS) encompasses a family of rare, usually benign, neoplastic processes arising from the synovium of joints, bursae and tendon sheaths, with pigmented nodular tenosynovitis occurring most commonly in the digits. While DECT has been proved effective for the detection, characterization and quantification of uric acid deposits in patients with gout [1], additional musculoskeletal applications have been suggested, including the detection of iron deposition in PVNS [2]. To our knowledge, this is the first description of non-invasive molecular imaging of PVNS using DECT.

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present work). All other authors have declared no conflicts of interest.

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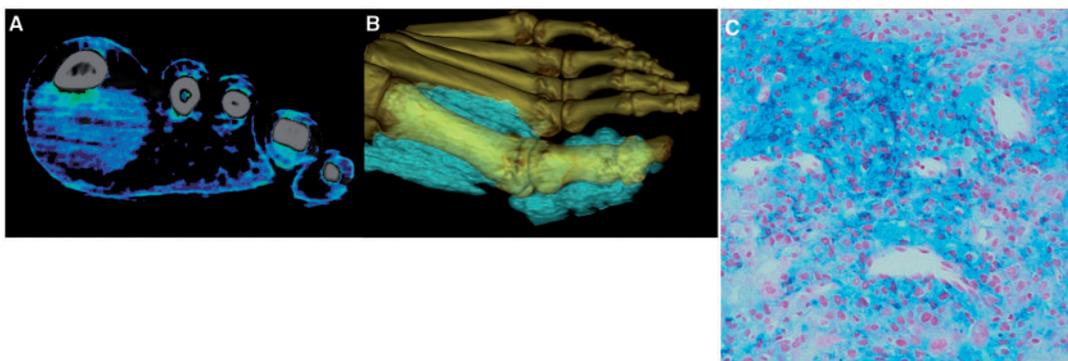
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Fig. 1 Dual-energy CT and histopathology images of localized pigmented nodular tenosynovitis



(A) Axial and (B) three-dimensional volume-rendered dual-energy CT images of the left foot illustrate the presence of iron material (colour coded in blue) within the distal synovial sheath of the flexor hallucis longus tendon, consistent with localized pigmented nodular tenosynovitis, also referred to as giant cell tumour of the tendon sheath.

(C) Photomicrograph of the core needle biopsy specimen revealed intra- and extracellular haemosiderin, bland mononuclear cells and scattered multinucleated giant cells (Prussian blue stain; original magnification 100×).

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