

Potential Pitfall of Dual-energy Computed Tomography in Diagnosing Intra-osseous Gout with Pathological Fracture

To the Editor: The case report by Chan et al¹ is useful in understanding the mechanism and potential pitfall of dual-energy computed tomography (DECT) in diagnosing gout. In addition, it illustrates the cellular model of chronic gouty tophus, which appears as chronic granulomatous lesions comprising mononucleated and multinucleated macrophages surrounding a core of monosodium urate monohydrate (MSU) crystals and encased by dense connective tissue. Within the tophus, various zones have been identified: the central crystalline core, the cellular corona zone surrounding the central core, and the outer fibrovascular zone.² I wonder whether the presence of fracture in the tibia that underwent active osteolytic and osteoclastic processes during healing would alter the mineralisation density of the chronic tophi and thus be out of the range of the software to identify it as gout (default, >130 Hounsfield units). If so, radiologists should be aware of this pitfall of DECT in diagnosing intra-osseous gout with pathological fracture. DECT can detect MSU crystal deposition within the joint, on the bone surface, and within bone erosion (intra-osseous), but not within the bone in the absence of a cortical break.³ MSU

crystals deposit outside bone and contribute to bone erosion through an 'outside-in' mechanism.³ Better understanding of the pathogenesis of intra-osseous gout and a software algorithm of gout in DECT may enable radiologists to make an accurate diagnosis.

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