These differed between ACPA-subgroups, implying a different interaction of synovium and bone in these patients.

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OP0177

PROPERTIES AND LOCATIONS OF COLOR-CODED DUAL ENERGY CT LESIONS IN GOUT PATIENTS – A SYSTEMATIC EVALUATION

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Background: Dual energy CT (DECT) has diagnostic potential in gout patients. DECT can automatically colour-code presumed urate deposits based on radiodensity (Hounsfield Units, HU) and DECT ratio (difference in attenuation between high and low kV series) of lesions. However, other materials may imitate properties of urate deposits, most importantly calcium-containing material, dense tendons and artefacts, which may lead to misinterpretations. The characteristics of DECT lesions in gout patients have not yet been systematically investigated.

Objectives: To evaluate the properties and locations of colour-coded DECT lesions in gout patients.

Methods: DECT were performed in patients with suspected gout. Patients were separated into gout and non-gout patients based on joint fluid microscopy findings. DECT of the hands, knees and feet were performed using default gout settings and colour-coded lesions were registered. Only location-relevant lesions were analysed (e.g. nail bed artefacts excluded). Mean density (mean of HU at 80kV and Sn150kV), mean DECT ratio, size and location of each lesion was determined. Subgroup analysis was performed post-hoc evaluating potential differences in properties and locations of lesions. Lesions were separated into groups according to properties (Figure 1, grey box): 1) *Size*—to separate artefacts characterised by small volume (*possible artefacts*). 2) *DECT ratios*—to separate calcium-containing material characterised by high DECT ratio (*possible calcium-containing material*). 3) *Density*—to separate dense tendons characterised by low DECT ratio and low HU values (*possible dense tendons*). Lesion fulfilling all urate characteristics (large volume, low DECT ratio, high density) were labelled *definite urate deposits*. Finally, for non-gout patients, properties of *non-gout urate-imitating lesions* (properties as *definite urate deposits*) were analysed.

Results: In total, 3918 lesions (*all lesions*) were registered in gout patients (n=23), with mean DECT ratio 1.06 (SD 0.13), median density 160.6 HU and median size 6 voxels (Figure 1, blue box). Lesions were seen in all analysed joints, most frequently MTP1 joints (medial side), knee joints and midtarsal joints (Figure 2a). Tendon affections were also common, especially in the knee tendons (patella and quadriceps), malleolus-related tendons (e.g. peroneus and tibialis posterior) and the Achilles tendons (Figure 2a).

Subgroup analyses showed that *definite urate deposits* (figure 2b) were found at the same locations as *all lesion* in gout patients (figure 2a), with the four most common sites being MTP1 joints, midtarsal joints, and quadriceps and patella tendons (Figure 2b). *Possible dense tendon* lesions had a mean HU value of 156.5 HU—markedly higher than expected for dense tendons (<100HU)—and lesion-locations were similar to *definite urate deposits* (data not shown), indicating that they primarily consisted of true urate deposits. In contrast, *possible calcium-containing material* and *non-gout urate-imitating lesions* had distinctly different properties (ratios 1.33 and 1.20, respectively) (Figure 1, yellow and orange box). Furthermore, the locations of these lesions were different from *definite urate deposits* since they were primarily found in a few weight-bearing joints (knee, midtarsal and talocrural including malleolus regions) and tendons (Achilles and quadriceps), whereas no lesions were found in either MTP1 joints or patella tendons (figure 2c).

Conclusion: DECT color-coded lesions in gout patients are heterogeneous in properties and locations. Subgroup analyses found that locations such as MTP1 joints and patella tendons were characterised by almost only showing *definite urate deposits*. A sole focus on these regions in the evaluation of gout patients may therefore improve specificity of DECT scans.

Figure 1: Properties of color-coded DECT lesions in gout and non-gout patients

Figure 2

A: Distribution of all lesions in gout patients

B: Distribution of definite urate deposits in gout patients

C: Distribution of possible calcium-containing material in gout patients and non-gout urate-imitating lesions

MCP, metacarpophalangeal joints; PIP, proximal interphalangeal joints; DIP, distal interphalangeal joints; MTP, metatarsophalangeal joints

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OP0178

IMAGING NEOANGIOGENESIS IN RHEUMATOID ARTHRITIS (INIRA): WHOLE-BODY SYNOVIAL UPTAKE OF A 99mTc-LABELLED RGD PEPTIDE IS HIGHLY CORRELATED WITH POWER DOPPLER ULTRASOUND

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Background: Power Doppler ultrasound (PDUS) is superior to clinical examination in detecting synovitis in patients with rheumatoid arthritis (RA). Although dynamic and cheap it is impractical to scan large numbers of joints in routine clinical settings. MRI, whilst sensitive for synovitis, is expensive and routine use is limited to targeted joints. Bone scintigraphy produces whole body images but due to limited specificity is not routinely used.