Gouty Tophi and Haglund's Deformity in the Right Foot

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History

An 84-year-old male patient, suffering from long-term arthrosis, had been treated for hyperuricemia. Recently, although the serum uric acid test results were normal, the patient had been complaining of pain in the right foot. A TwinBeam Dual Energy (TBDE) CT scan was requested for further evaluation.

Diagnosis

DECT images revealed small discrete uric acid deposits next to the 1st, 2nd and 3rd metatarsophalangeal joints. Signs of bone erosion of the 2nd distal metatarsal were also seen. A Haglund's deformity of the calcaneus was shown with a bony prominence in the posterior superior aspect and this was associated with a calcaneus spur.

Examination Protocol

Scanner	SOMATOM Definition Edge		
Scan area	Right foot	**DLP**	154.2 mGy cm
Scan mode	TwinBeam Dual Energy	**Effective dose**	0.12 mSv[1]
Scan length	230 mm	**Rotation time**	0.5 s
Scan direction	Cranio-caudal	**Pitch**	0.35
Scan time	8.4 s	**Slice collimation**	64 × 0.6 mm
Tube voltage	AuSn120 kV	**Slice width**	0.75 mm
Effective mAs	290 mAs	**Reconstruction increment**	0.5 mm
Dose modulation	CARE Dose4D™	**Reconstruction kernel**	Q30f
CTDIvol	6.2 mGy		

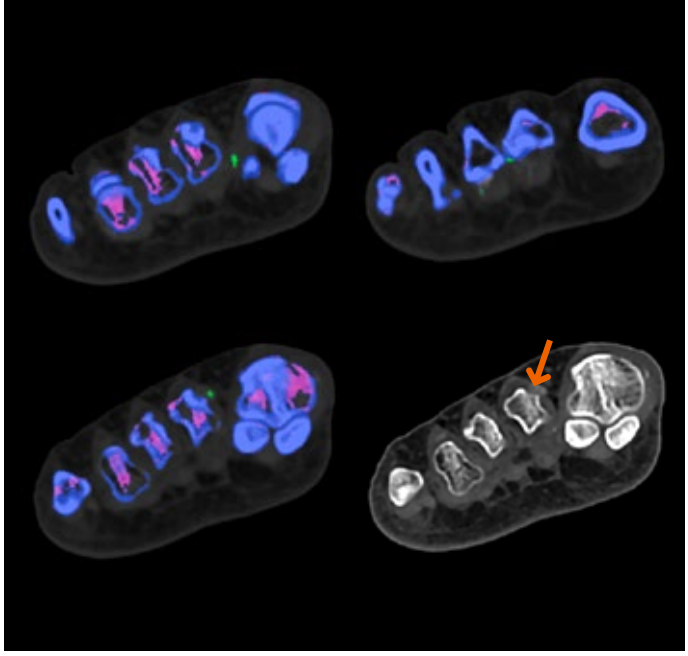
[1] Estimated by applying a conversion factor of 0.0008.

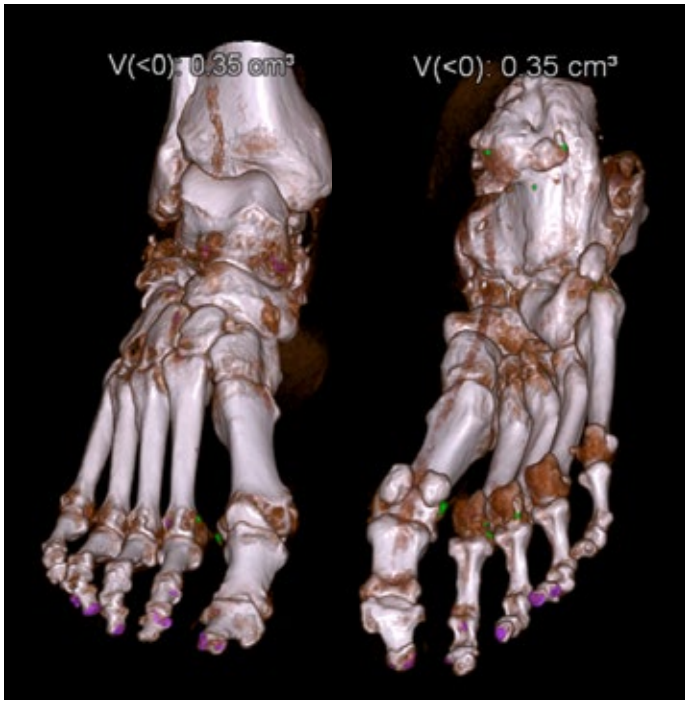
The outcomes by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

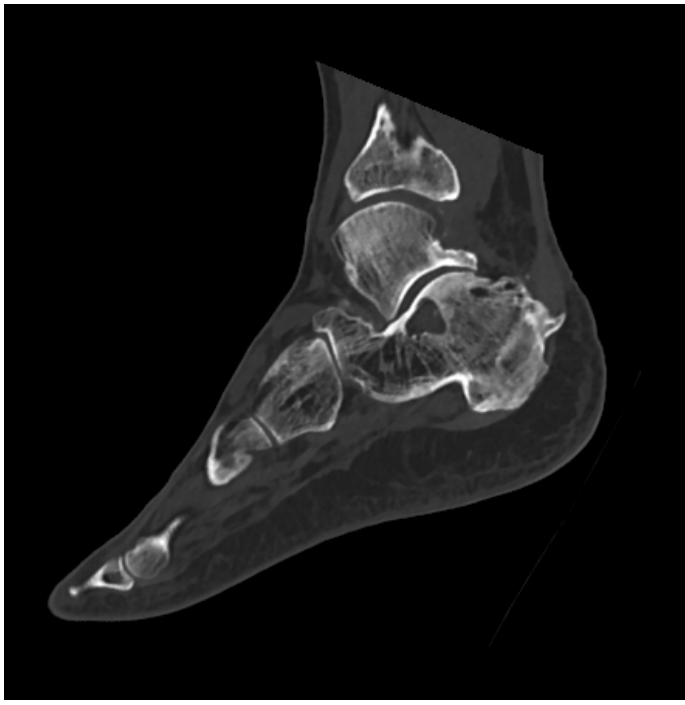
Comments

Before DECT, synovial fluid aspiration was accepted as the most reliable way of diagnosing gout. Hereby, the presence of monosodium urate crystals could be confirmed. The method does, however, have some inherent limitations such as sampling or interpretation errors.[1, 2, and 3] Therefore, alternative tests are desirable for the detection of MSU crystals in order to aid the clinicians in distincting gouty arthritis from other types of inflammatory arthritis and also to avoid unnecessary and ineffective treatment strategies. While the chemical composition of uric acid precipitates has unique characteristic patterns of CT numbers at high versus low kilovolts (kV), TBDE CT can acquire high and low kV datasets simultaneously in a single scan thus allowing visualization of MSU deposition. This is especially helpful in anatomic areas where aspiration can be difficult to perform as well as in cases of extra-articular MSU deposits around tendon and ligament attachment sites where the analysis of intra-articular SF would reveal negative results.

A Haglund's deformity was first described by Patrick Haglund in 1927. [4] It is characterized by an enlargement of the bony section of the heel (where the Achilles tendon is attached)







1 DECT images revealed small discrete uric acid deposits next to the 1st, 2nd and 3rd metatarsophalangeal joints (in green) along with signs of bone erosion of the 2nd distal metatarsal (Fig. 1a, arrow).

2 Cinematic rendering (Fig. 2a) and MPR (Fig. 2b) images show Haglund's deformity of the calcaneus with bony prominence in the posterior superior aspect, and this was associated with a calcaneus spur.

which can aggravate the retrocalcaneal bursa causing bursitis and pain. It is also sometimes associated with a calcaneus spur.[5]

In this case, both diagnoses were made in one TBDE scan with an effective dose of only 0.12 mSv. ●

References

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