

# Dual Source CT

## Gout imaging with Dual Energy

### SOMATOM Definition Dual Energy scanning

Author: Savvas Nicolaou, MD, Vancouver General Hospital, Department of Emergency Radiology; Hyon Choi, MD, Department of Rheumatology, Arthritis Center, University of British Columbia; Vancouver / Canada

#### HISTORY

A 73 year-old male was referred for a Dual Source CT for the etiology of palpable masses and joint deformity along the plantar and medial aspects of both 1<sup>st</sup> metatarsal joints. A scan of the feet was performed on the SOMATOM Definition using spiral dual energy evaluation.

#### DIAGNOSIS

The dual energy scan revealed a massive build-up of uric acid along the patient's left and right foot primarily along both 1<sup>st</sup> metatarsal phalangeal joints. Gouty tophus formation with adjacent prominent erosions at the 1<sup>st</sup> metatarsal heads turned out to be the cause for the joint deformity and palpable masses. Monosodium urate crystals are usually deposited mainly in joints, along tendons, soft tissues and bursae. Conglomerate masses of urate presenting as tophus formation usually develop after a patient has suffered from the disease for many years, i.e. chronic gout but they can occur in patients who have never had acute gouty arthritis.

Treatment: The objectives are to terminate the acute attack with anti-inflammatory drugs, prevent recurrent attacks with daily colchicine or an Non Steroidal Anti-Inflammatory Drug (NSAID) and prevent further deposition of urate crystals and resolve existing tophi by lowering serum urate levels by increasing urate excretion with a uricosuric agent or by blocking urate production with allopurinol.

#### COMMENTS

In the dual energy mode, two x-ray sources can be operated simultaneously at different kV levels. The results are two spiral data sets acquired in a single scan providing diverse information that allows one to differentiate, characterize, isolate, and distinguish the imaged tissue and material. For gout imaging material decomposition is used to visualize uric acid deposits in the extremities.



Visualization of severe masses of uric acid deposits along both 1<sup>st</sup> metatarsal phalangeal joints of left and right foot, as well as urate deposition in multiple joints of the foot and ankle joint.

## EXAMINATION PROTOCOL

<b>Scanner</b>	<b>SOMATOM Definition</b>
<b>Scan area</b>	<i>Feet</i>
<b>Scan length</b>	<i>224 mm</i>
<b>Scan time</b>	<i>54 s</i>
<b>Scan direction</b>	<i>Caudo-cranial</i>
<b>kV</b>	<i>140/80 kV</i>
<b>Effective mAs</b>	<i>50/170 eff mAs</i>
<b>Rotation time</b>	<i>1.0 s</i>
<b>Slice collimation</b>	<i>0.75 mm</i>
<b>Reconstructed slice thickness</b>	<i>0.6 mm</i>
<b>Increment</b>	<i>0.5 mm</i>
<b>CTDIvol</b>	<i>3.96 mGy</i>
<b>Kernel</b>	<i>D30</i>

The information presented in this case study is for illustration only and is not intended to be relied upon by the reader for instruction as to the practice of medicine. Any health care practitioner reading this information is reminded that they must use their own learning, training and expertise in dealing with their individual patients. This material does not substitute for that duty and is not intended by Siemens Medical Systems to be used for any purpose in that regard.

The drugs and doses mentioned herein are consistent with the approval labelling for uses and/or indications of the drug. The treating physician bears the sole responsibility for the diagnosis and treatment of patients, including drugs and doses prescribed in connection with such use. The Operating Instructions must always be strictly followed when operating the CT System. The source for the technical data is the corresponding data sheets. Results may vary.