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Erosive tophaceous gout and uric acid nephrolithiasis: microscopic and 3D HRpQCT findings

Authors: Giovanni Adami¹, Francesca Ruzzon¹, Angelo Fassio¹, Davide Gatti¹, Matteo Gatti², Maurizio Rossini¹

1. Rheumatology Unit, University of Verona, Verona, Italy
2. Nephrology Unit, University Milano-Bicocca, Milan, Italy

Corresponding author:

Giovanni Adami MD, PhD

Rheumatology Unit, University of Verona, Verona, Italy

Pz Scuro 10, 37134, +0458124049

email: giovanni.adami@univr.it

Authors' academic titles and personal contacts

Dr. Giovanni ADAMI MD, giovanni.adami@univr.it

Dr. Francesca RUZZON MD, fra.ruzzon@gmail.com

Dr. Angelo FASSIO MD, angelo.fassio@yahoo.it

Prof. Davide GATTI MD, davide.gatti@univr.it

Dr. Matteo Gatti MD, matgat93@gmail.com

Prof. Maurizio ROSSINI MD, maurizio.rossini@univr.it

Consent for publication

The patient provided consent for the publication of anonymized data.

Competing interests

Giovanni Adami has received advisory board honoraria, consultancy fees and/or speaker fees from Theramex, UCB, Lilly, Galapagos, Fresenius Kabi, Amgen, BMS, Abiogen and Pfizer. Davide Gatti has received advisory board honoraria, consultancy fees and/or speaker fees from Abiogen, Celgene, Eli-Lilly, Neopharmed-Gentili, Pfizer, UCB. Maurizio Rossini reports advisory board honoraria, consultancy fees and/or speaker fees from AbbVie, BMS, Eli-Lilly, Galapagos, Sandoz, Theramex, UCB, outside the submitted work. Angelo Fassio reports personal fees from Abiogen, Novartis, Neopharmed.

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Clinical image

A 58-year-old man presented to the rheumatology outpatient clinic for evaluation. He reported multiple brownish rounded kidney stones (panel A), recurrent hand and foot arthritis, and severe hand deformities (panel B) over the last five years. A urine sample was collected and analyzed with the polarized microscope (panel C) showing multiple spear-shaped uric acid crystals in urine sediment with strong double refraction and negative birefringence in polarized light. Joint aspiration was performed as well at the III metacarpophalangeal joint of the right hand. Chalky white synovial fluid was analyzed with the polarized microscope (panel D), showing multiple needle-shaped crystals with strong double refraction and negative birefringence in polarized light. An agglomerate of monosodium urate crystals was also demonstrated (panel D). Serum urate was 13.5 mg/dL, and a diagnosis of gout with uric acid nephrolithiasis was made. Cone-beam high-resolution peripheral quantitative computed tomography (HRpQCT, ArtiCAT RAR Srl) was performed with 60 μ m voxel resolution and 5x5x5 cm scan volume. Panels E and F show a punched-out gouty erosion's three-dimensional image reconstruction and multiplanar sections. Physical examination clearly demonstrated tophi, including over the 3rd MCP joint, which aligns with the site of the gouty erosion.

