Clinical Images: Arteriovenous fistula steal syndrome causes severe tophaceous gout

The patient, a 53-year-old male renal allograft recipient with a history of gouty arthritis, presented for evaluation of tophi on the left hand. The patient had end-stage renal disease caused by Alport’s syndrome. Hemodialysis was initiated in 1993, and 7 years later he received a kidney transplant. He was receiving treatment with the calcineurin inhibitor tacrolimus and had ongoing stable allograft function. Clinical examination revealed collections of solid urate tophi (arrows) only in the soft tissue of the left hand (A). The tophi were painful and caused local inflammation in the surrounding tissue. The right hand was unaffected (B). The patient’s serum uric acid level was 10.7 mg/dl. Elevated serum uric acid levels in the range of 8.7 mg/dl to 12.5 mg/dl had been documented over 6 years. He still had a patent arteriovenous fistula (AVF) from hemodialysis, with severe aneurysmatic dilation (C) and access blood flow of 3,000 ml/minute measured by Doppler ultrasound. We hypothesized that AVF steal syndrome was causing reduced blood flow, acidosis, and reduced temperature in the left hand, which could favor deposition of urate crystals (even with normal serum urate levels) (1). We performed indocyanine green–enhanced fluorescence optical imaging of both hands to determine microperfusion. Perfusion was severely compromised in the left hand (D). (See Supplementary Video 1, available on the Arthritis & Rheumatology web site at http://onlinelibrary.wiley.com/doi/10.1002/art.40131/abstract.) We also detected severe inflammation surrounding the tophi (E). (See Supplementary Video 1.) Therefore, a combined approach of uric acid–lowering medication and AVF ligation was recommended to restore microperfusion in the left hand and allow disassembly of the tophi over time.


Jan Neumann, MD
Susanne Kishan, MD
Stephan Kemmner, MD
Uwe Heemann, MD
Philipp Moog, MD
Christoph Schmaderer, MD
Klinikum rechts der Isar
Technical University of Munich
Munich, Germany