Monosodium urate-like crystals in stools of a gouty patient: intestinal tophi?

Sirs,

Gout has been studied at different levels, from identifying monosodium urate crystals (MSU) in synovial fluid and tophaceous material (1), to studying the gut microbiome. Currently, microbiome analysis tools include next-generation sequencing, and neglect the traditional microscopic analysis that allows the identification of the microorganisms interacting in the host (2), and the way in which diet contributes to health (3). Gout is a syndrome resulting from the articular deposition of MSU. However, extra-articular MSU deposits can occur in fingers, ears, kidney, colonic wall, among others (4), mimicking infectious and metastatic diseases, which can go unnoticed. We describe a gouty patient in which their faeces were analysed, and needle shaped crystals were found with strong birefringence.

A 48-year-old male with a proven diagnosis of gout attended our outpatient clinic of the rheumatology department. For 10 years, he had several mono-/oligoarthritis episodes. He had no renal lithiasis, or subcutaneous tophi, no history of antibiotic, or anti-parasitic use in the last three months, with no diagnosis or symptoms of any gastrointestinal condition. To characterise the microbiota, we obtained fecal samples. Clear-field microscopic analysis of faeces showed needle-shaped crystals, with a length of 55.6±14.7 μm (Fig. 1A), morphologically consistent with MSU crystals. Because of the usual severity of our gout patients (1), we considered the possible presence of tophi on the gut lumen (2, 3). Under uncompensated polarised light microscopy, the crystals showed strong birefringence (Fig. 1B), although using compensated light a positive elongation showed a blue colour when parallel to the compensator axis, indicating that the crystals were not MSU (Fig. 1C). The patient answered a previously validated food intake frequency questionnaire (5). He reported, at least once a week, the intake of the so-called "green juice", which includes celery, pineapple, cactus, and sour prickly pear, among other foods.

We analysed a pineapple sample through visible and polarised light (Fig. 1D-E), verifying the presence of raphides in bundles of two or clusters. Moreover, they also were found in celery and kiwifruit, which was used as a positive control by scanning electron microscopy (Fig. 1F). Raphides are a plant defense mechanism consisting of needle-like calcium oxalate (CaOx) crystals, present in a large number of plants (6) and are ejected when the plant suffers mechanical stress, such as being chewed (7). Stools from a healthy individual with an ingestion of pineapple were analysed, and the same structures were identified. Thus, the raphides in faeces were associated with the consumption of fruits containing CaOx crystals (8) which are not altered by digestion and may cause irritation in the mouth, throat and digestive tract, and also, contact dermatitis (9). The raphides in faeces had not been previously reported and they could be confused with MSU. Our manuscript indicated that we should distinguish real MSU crystals from an intestinal tophus, and the fakes ones induced by diet.

The origin and location of the biological sample is especially relevant, since there is no clinical interest for the rheumatologists who do not routinely look for crystals in faeces. After observation with clear-field microscopy of crystals in this sample, we wondered where these MSU-like crystals were coming from, and the compensated polarised microscopy revealed that we needed to look for something different. The dietary habits finally brought us to verify the nature of the raphides. It is important to highlight that raphides are very similar to MSU, which can create confusion, especially in some cases of chronic gout, where intestinal tophi may occur and prompt unnecessary diagnostic tests if unrecognised.

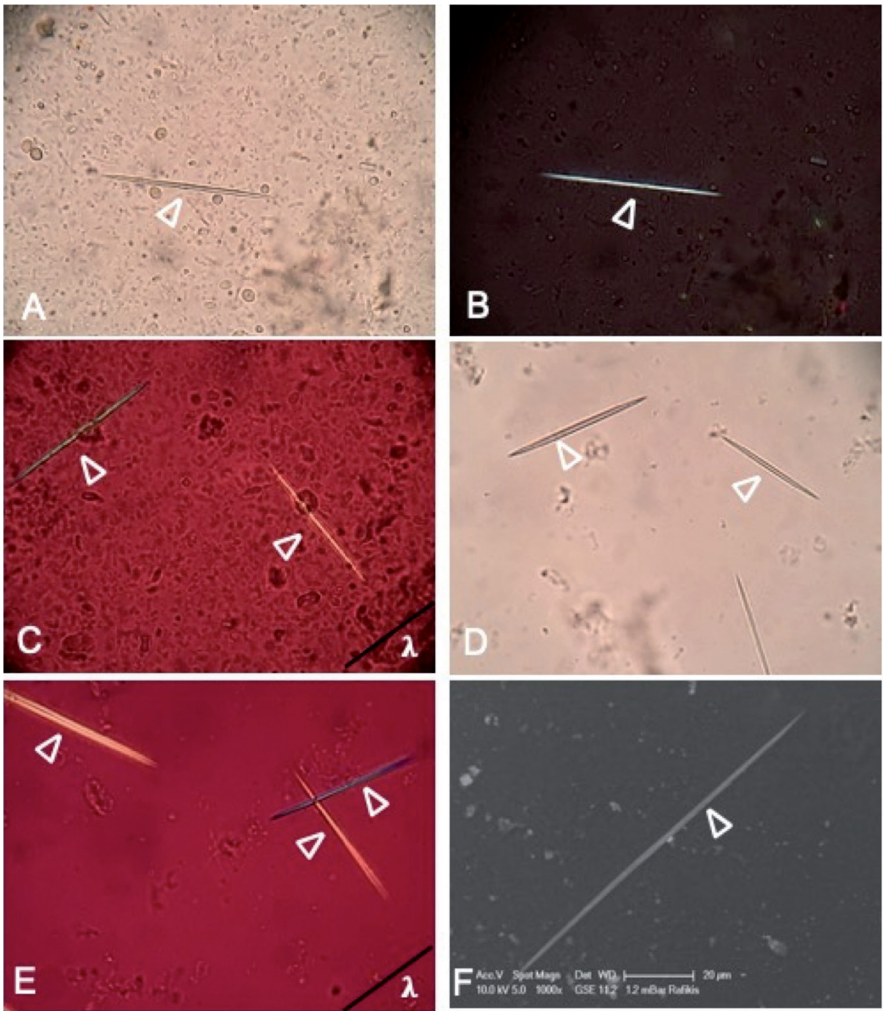

Fig. 1. CaOx crystal identification.
A: A raphide isolated from stool showing a needle shape (arrowhead) under light microscopy.
B: A needle crystal in fecal matter showing strong birefringence under polarizing filters (arrowhead).
C: The positive birefringence of a crystal under polarised and compensated light; the black bar indicates the compensator axis (arrowhead).
D: Raphides isolated from pineapple (arrowhead) observed under light microscopy.
E: Pineapple's raphide showing positive birefringence under compensated light; the black bar indicates the compensator axis. All photographs were taken with a 40x objective.
F: A raphide (arrowhead) isolated from kiwifruit, observed as a positive control by scanning electron microscopy.

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