Case report

Medical Ultrasonography
2009, Vol. 11, no. 4, 83-86

Tophaceous gout – clinical and imagistic aspect. Case report

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Abstract

Tophaceous nodules can be difficult to diagnose when they are the only clinical manifestation of the gout. We present a case with multiple painless tophaceous gout nodules of the right third hand finger. The high level of uric acid, the ultrasonographic and radiologic examination established the diagnosis and allowed us to differentiate the lesions from other (kind of subcutaneous nodules.

Key words: tophi, ultrasonography, radiography

Rezumat

Nodulii gutoşi (tofii) pot fi dificil de recunoscut dacă aceştia sunt unica manifestare clinică a gutei. Prezentăm cazul unui pacient cu multiplii tofi nedureroşi la nivelul degetului III a mâinii drepte. Nivelul crescut al acidului uric împreună cu ecografia si examenul radiologic au permis stabilirea diagnosticului şi diferenţierea acestora de alţi noduli subcutanaţi.

Cuvinte cheie: tofi, ecografie, radiografie

Gout is a systemic metabolic disease affecting more than 1% of the population. Four clinical stages (asymptomatic hyperuricemia, acute gouty arthritis, intercritical gout, and chronic tophaceous gout) are described. Chronic tophaceous gout usually develops 10 or more years of acute intermittent gout, although in rare cases tophi may be the initial manifestation of the disease [1,2]. Tophi may appear at any site, but the most common sites are the digits of the hand and of the the feet and the olecranon bursa. Also, tophi may be associated with destructive deforming arthritis [1]. In these cases the differential diagnosis with other types of arthritis should be done.

We present a patient whit multiple nodules on the distal phalanx of the third right digit, painless, without any inflammatory findings, with restricted movement of the distal interphalangeal joint (DIP). Ultrasonography and radiologic investigation allowed us to differentiate the lesions from Heberden nodules or osteoarthritis and to interpret them as being tophi.

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Case presentation

A 78-year-old man was admitted for an ischemic stroke. He had mild blood pressure hypertension and ischemic heart disease. During clinical examination, at the distal phalanx of the third finger of the right hand we observed multiple nodules. The nodules were firm and painless, the skin was normally coloured and no associated soft tissue erythema or oedema was seen. The nodules could not be mobilised on palpation and the DIP joint had restricted movement. No other nodules could be found near the other joints. First we interpreted the nodules as possible hypertrophic Heberden nodules, especially due to the clinical aspect from the extensor part of the

Fig 1. Clinical aspect of the third finger – multiple nodules, without skin modifications. **a)** from the extensor part the nodules must be differentiated from Heberden nodules; **b)** from the flexor part the asymmetric deformation of the distal phalanx rise the suspicion of a tumoral process.

Fig 2. Longitudinal sonogram of the extensor part of the finger. The joint space (*), between the second and the third phalanx could be not evaluate due to the posterior acoustic shadow. Arrows – the nail, solid arrow – „step up" denivelation of the bone contour.

finger, associate with DIP osteoarthritis. Laboratory tests revealed high value of the uric acid (8.1 mg%, normal range 3-5 mg%). Ultrasonographic evaluation of the finger found hyperechoic, inhomogeneous nodular masses, with good delineation from the flexor tendon, the nail, and the skin. Due to the posterior acoustic shadow created by the nodules, the bone surface and the joint cavity could not be investigated. Inside these large solid nodules, small hyperechoic spot, less than 1 mm, not generating acoustic shadow, were observed. No significant Doppler signal could be obtained inside or around the nodules. On X-ray film a homogeneous opacity in the soft tissue mass, sharply marginated bone erosions ("punched-out" lytic bone lesion) with sclerotic borders, and DIP joint space preservation in the area without erosions were observed.

All these findings were consistent with the tophaceous gout diagnosis.

Before discharge, after the mental status of the patients was recovered, he remembered a single episode of left metatarsophalangeal joint acute arthritis (podagra), 15 years before, with spontaneous remission in few days.

It was interpreted as chronic tophaceous gout. Allopurinol (300 mg/day) was initiated. Due to the absence pain, anti-inflammatory drugs and colchicine were considered to be unnecessary.

Discussions

While gout is a common disease, the diagnostic of tophi is sometimes difficult, especially in cases without a clear history of gouty attacks. The cases with tophi as the first manifestation of the disease could be a challenge for the clinician. Generally these cases differ from those with typical gout (older patients, frequently women, usually with predominant or exclusive finger involvement, most of them with renal insufficiency and with anti-inflammatory or diuretic therapy) [2]. In our case there was a single gouty attack in the patient history. It was useful for our interpretation that the attack had the typical character of podagra.

Synovial fluid aspiration and its microscopically analysis is considered to be the gold standard for the diagnosis of gout [3]. Demonstration of the monosodium urate crystals inside a tophus has the same signification. In clinical practice the joint aspiration could not always be performed so the diagnosis is made using the clinical aspect, the imagistic investigation, and the uric acid level. Practically, the currently available clinical criteria for classification of the presence of gout are neither very sensitive nor specific. The New York and the Rome criteria had similar sensitivities and specificities [4]. Despite of these, there are authors [4] with the opinion that "crystal identification should be recommended for patients clinically diagnosed as having or not having gout by other criteria who are not responding as expected to management". In our case we did not consider necessary to perform the biopsy of a nodule, considering suggestive for diagnosis the findings from ultrasonography, radiology and laboratory examination.

The pathological findings that can be ultrasonographically identified in gout depend on the anatomically affected structure (tendon, joint, cartilage, soft tissue) and

Fig 3. Longitudinal sonogram of the flexor part of the finger. The flexor tendon is hypoechoic due to anisotropy. The tophi have good delineation from the tendon. Arrows- monosodium urate deposits.

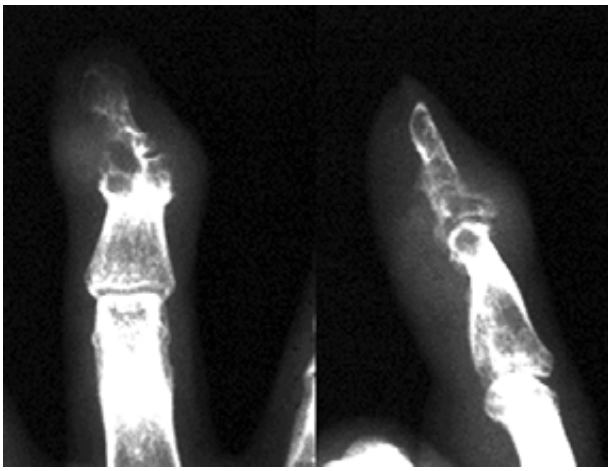

Fig 5. The detailed aspect of the third finger.

Fig 4. X-ray of the right hand: a homogeneous opacity in the soft tissue mass, sharply marginated bone erosions ("punched-out" lytic bone lesion) with sclerotic borders, and DIP joint space preservation in the area without erosions were observed.

on the clinical stage (joint effusion, synovial hypertrophy, tophi, bony erosions). Two types of tophi were described on ultrasonographic examination: soft tophi, that are typically of varying echogenicity and soft also to palpation and hard tophi, that contain monosodium urate deposits generating a hyperechoic band with an acoustic shadow and that are harder in consistency to palpation [5]. Our patient presented only hard tophi, with important acoustic posterior shadow, thus being impossible to analyse the aspect of the cortical bone and of the DIP joint. In this case the X-ray examination was the method used to evaluate the bone and joint aspect. The X-ray findings were considered to be with high signification for gout. We considered that other imagistic method (CT or MRI) were not necessary. Both of the methods had demonstrated to be useful in tophi characterisation [6].

We correlate the lack of Doppler signal inside and around the tophi with the absence of pain, the normal colour of the skin, and the absence of any recent gouty attack. The increased vascularity around the tophi observed at colour Doppler ultrasonography was correlated with the MRI enhancement after gadolinium injection and it was considered to be sign of inflammatory reaction [6].

Despite that a flexor tendon in the hand is rarely affected by gout [7] we consider very interesting the absence of the tendon involvement in this case with multiple tophi, practically surrounding the tendon. Maybe the tendon sheath acts as a protective barrier against the crystal deposition. Also, it was interesting that the third right finger was the only anatomical region of crystal deposition. We found no ultrasonographic pathological findings in the left metatarsophalangeal joint of the toe.

The slow rate of progression of the disease is another particularity of the case.

In conclusion the correct diagnosis of a tophus could be a problem in daily practice, especially in the atypical gout cases. Ultrasonography has to be considered as an important imagistic tool in interpretation and diagnosis of a subcutaneous nodule.

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