Clinical picture

An unusual case of multiple subcutaneous large tophi

Case report

A 76-year-old man with a 30-year history of gout was admitted for chronic renal failure and the articular pain at the right foot. He was noted to have multiple hard swelling. The swelling developed over 10 years, progressively increasing in size. Physical examination revealed that there were multiple large firm tophi on the hands, both olecranon processes, and feet (Figure 1A).

Laboratory investigations showed: serum uric acid 728.0 μmol/l (155.0–428.0 μmol/l), urea 10.3 mmol/l (2.8–8.2 mmol/l) and creatinine 213.3 μmol/l (35.0–104.0 μmol/l). Three-dimensional computed tomography (3D CT) images have demonstrated extensive tophaceous deposits (visualized as nodules) in the right foot, particularly at the first metatarsal phalangeal joint and midfoot (Figure 1B).

Treatment was established with celecoxib (100 mg every 12 h). After 3 days, he experienced relief of the joint pain. On day 10, celecoxib was discontinued. He was started on an escalating dose of allopurinol, beginning with 50 mg/day until reaching 200 mg/day. His subsequent recovery was uneventful.

Discussion

Gout is characterized by recurrent episodes of extremely painful and debilitating joint and surrounding soft tissue inflammation caused by monosodium urate crystals. Tophi are generally regarded as a slow process. In fact, since the introduction of modern medication for hyperuricaemia, only <5% of patients may not respond to medical management. As a result, some of these cases may progress to the tophaceous stage, but the formation of a large tophus is extremely rare.

Figure 1. (A) Multiple large subcutaneous tophi are seen in the feet. (B) 3D CT images of the right foot demonstrating extensive tophi (dorsal view).
The severity of tophi is almost directly related to the duration and severity of hyperuricaemia. In this case, he was treated with short intermittent courses of allopurinol ~30 years, so it is possible that long-standing gout with a 30-year history and non-standard treatment might contribute to the development of multiple large tophi. In addition, it has previously been suggested that reduced renal function may contribute to the development of tophi. Decreased glomerular filtration rate may result in reduced excretion of uric acid and sustained hyperuricaemia, so renal dysfunction may expedite the development of the gout and the formation of tophi in this patient. Considering the aggressiveness of the disease, this case also indicates that early diagnosis and standard treatment of gout are essential.

Generally, the clinical diagnosis of gouty tophus is easily rendered, even in the absence of pathologic material, if the clinical and radiologic features are classic. Our case highlights the application of 3D CT imaging in excellently diagnosing tophi. First, 3D CT imaging provides high spatial resolution and allows for excellent visualization of tophi. In addition, the 3D CT imaging method enables accurate, highly reproducible measurements regarding the location and magnitude of tophi, which help facilitate surgical intervention.

In summary, our case was quite impressive due to the dimensions of the tophi. More importantly, this report highlights the important value of 3D CT in non-invasive diagnosis and accurate measurement of the extent of tophi. For this reason we believe that where available, 3D CT may offer abundant information in patients with gout.

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References