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CASE REPORT

A Rare Case of Elbow Tophus: Clinical, Radiological, and Histopathological Findings

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Abstract

Introduction: Gouty tophi represents an uncommon outcome of prolonged gout. The urate crystal deposition in soft tissues characterizes it. They can present as tender, soft tissue masses, mimicking benign growths. Elbow tophi are uncommon but can cause significant morbidity. **Case Report:** A 65-year-old man with a history of chronic gout came in with noticeable swelling on the outer side of his right elbow. The swelling was firm in consistency, non-fluctuant, and mildly tender. Radiological and Histopathological investigations confirmed the diagnosis of tophaceous gout. A successful surgical excision was performed with uneventful post-operative results. **Conclusion:** This case study emphasizes the significance of suspecting tophaceous gout in individuals presenting with significant, unexplained swellings, especially in patients with a known history of gout. Prompt recognition and proper treatment are essential to avert further complications.

Keywords: Elbow tophi, chronic gout, gouty arthritis, urate arthropathy

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Introduction

Gout is defined as a metabolic condition marked by increased levels of serum urate, which causes monosodium urate (MSU) crystals to accumulate in both joint and non-joint tissues. This can lead to recurrent episodes of joint inflammation [1]. In males, serum urate concentrations typically reach their highest levels at puberty, with a range of 5-6 mg/dL. In contrast, normal urate levels in females are considerably lower, averaging between 1-1.5 mg/dL Chronic gout may present with the deposition of MSU in soft tissues and skeletons such as tophi. Tophi may exist in bones and soft tissue places (e.g., skin, synovium, tendons, and ligaments [2–4]. The consistency of tophi may vary from inspissated, chalk-like deposits to semiliquid. Its firm diagnosis requires joint aspiration and demonstration of MSU under polarized light as negatively birefringent needle-shaped crystals [5]. Imaging helps to diagnose this disease. Plain X-rays can show erosive alterations due to chronic and repeated inflammatory episodes. Magnetic resonance imaging (MRI) proves useful for detecting tophi [6].

Case Presentation

A 65-year-old male from the Congo, who has a history of chronic gouty arthritis, came to us with a significant swelling on the extensor side of his right elbow. He was a non-vegetarian and was overall a healthy person with no medical comorbidities like chronic kidney disease, diabetes, and hypertension. He was not taking any uricosuric drugs for his gout and was only consuming non-steroidal anti-inflammatory drugs (e.g., Diclofenac and Ibuprofen) during the acute attacks of pain. The swelling, measuring 10x6 cm, had been gradually increasing over the last five years. The onset was gradual, and it slowly got bigger, sometimes causing pain. There were no signs of fever or any systemic symptoms associated with it. Upon physical examination, the swelling was found to be firm to hard, not fluctuating, unable to be reduced, and did not allow light to pass through. It was slightly painful, not attached to the skin, with no signs of venous prominence, and was fixed to the structures beneath it (Figure 1).

Figure 1. Clinical photograph of the right elbow, showing significant swelling (tophi) over the olecranon

The patient had a full, pain-free range of motion of the elbow joint without any neurovascular deficit, and the systemic examination was unremarkable, indicating the absence of other health issues. Haematological investigations revealed a raised serum uric acid level, i.e. 9.7 mg/dl, and the erythrocyte sedimentation rate (ESR) was normal. Radiographs of the left elbow showed a significant soft tissue shadow (Figure 2).

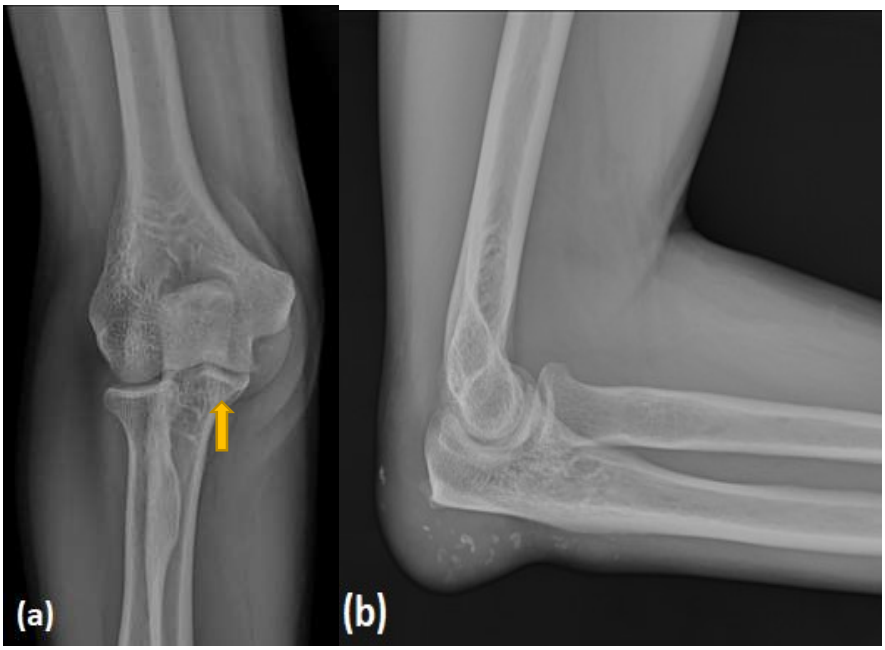

Figure 2. Radiographs *(a)* Antero Posteior (AP), *(b)* lateral show the preserved bone density of the bones. There are multiple calcified tophi seen in the olecranon bursa without adjacent erosion/destruction of the olecranon process (Fig. 2b).

MRI revealed a distended bursa with multiloculated mixed-intensity fluid, with inflammatory changes and thickening in the surrounding soft tissues. Multiple focal areas of blooming representing calcific foci were seen. The inflammatory changes were seen extending up to the insertional point of the triceps tendon, resulting in changes in tendinosis. No evidence of overt tear was noted. All these findings suggested olecranon bursitis secondary to gout (Figure 3). Joint aspiration was not considered in this case, to demonstrate crystals, as the swelling was extra-articular.

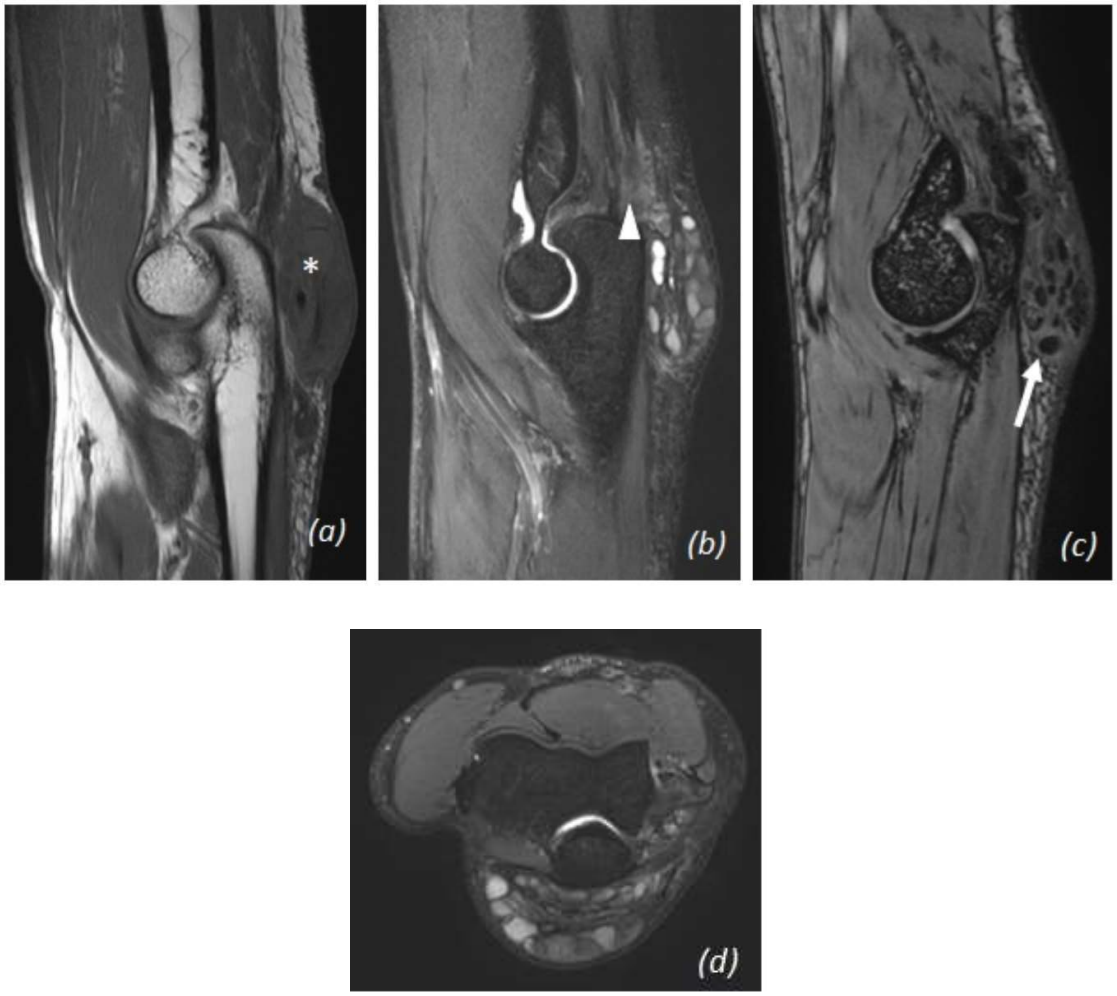

Figure 3. Magnetic Resonance Images of elbow-Sagittal *(a)* T1, *(b)* T2 FAT SAT, *(c)* SWI images show multiple focal areas of blooming (arrow in *(c)*) within the distended bursa representing calcific foci. The inflammatory changes extend up to the insertional point of the triceps tendon, resulting in changes in tendinosis (arrowhead in *(b)*). No evidence of overt tear was noted. Axial (*d)* T2 FAT SAT images showing distended olecranon bursae with multiloculated collections and calcific foci.

The surgical excision of the large right elbow tophi was performed under general anaesthesia. An en-bloc excision of the swelling was performed using a standard posterior approach. The procedure involved making an incision over the swelling, carefully dissecting the surrounding tissues to isolate the tophi, and then removing the tophi in one piece. The excised mass, which was found to be a white, chalky material, weighed 250 grams (Figure 4).

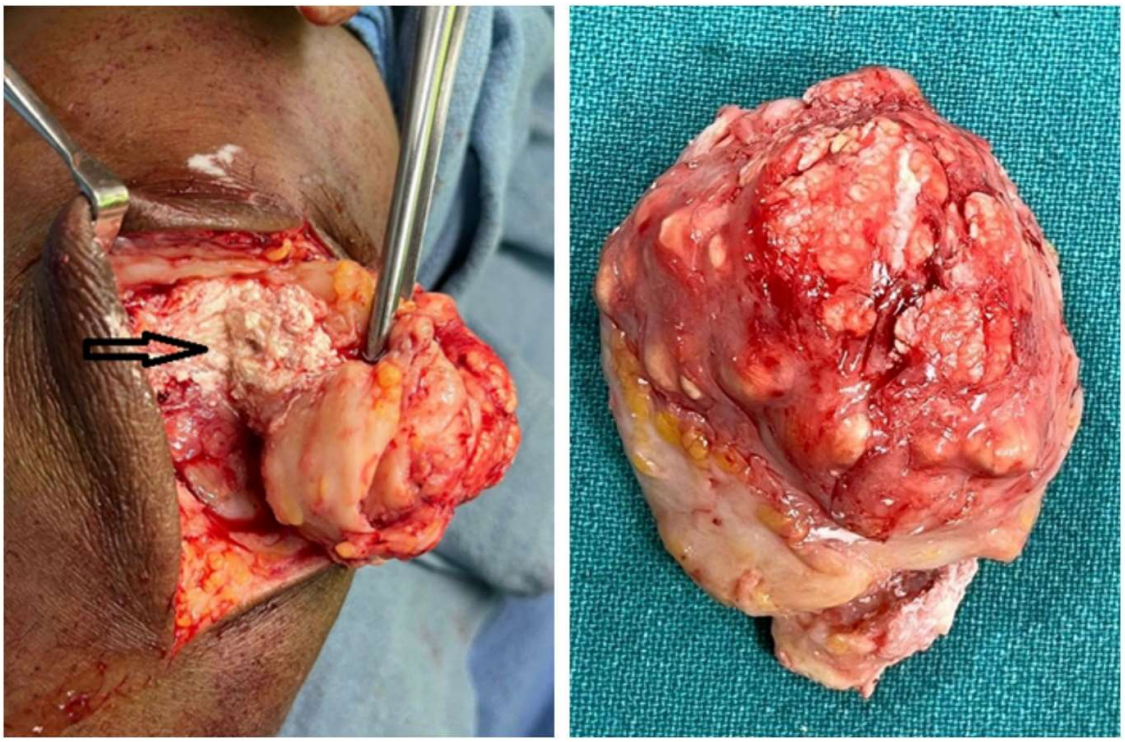

Figure 4: An excised mass of tophi (6.5×4.5×4 cms, 250 gms), arrow showing whitish, chalky material.

Histological examination of this single globular soft tissue piece measuring 6.5×4.5×4 cm (Figure 4) revealed an external surface of the smooth mass, which was shiny and focally fibrofatty. On cut open, yellow-white and whitish material was observed. A few cysts are noted, varying from 0.1 cm to 1.5 cm, and a few calcified areas are seen. Microscopically (Figure 5), there was fibro-collageneous tissue showing oedema and nodular aggregates with granuloma-like appearance consisting of acellular, amorphous, pale eosinophilic material with needle-like spaces surrounded by a palisading arrangement of histiocytes and occasional multinucleated giant cells, few lymphocytes and plasma cells. There was evidence of vascular dilation with haemorrhage, and areas of calcification were seen. Our diagnostic studies, both histopathological and radiological, confirmed the diagnosis of tophaceous gout.

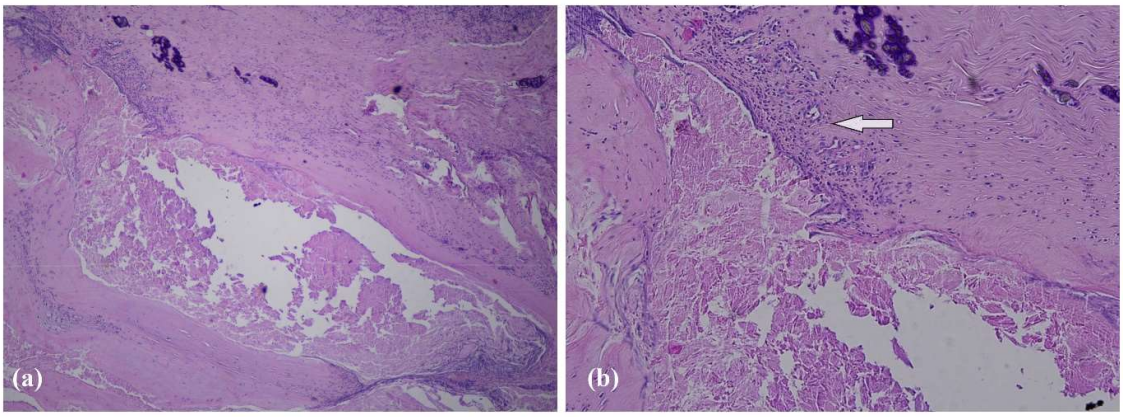

Figure 5 (a- 40x, and b-100x magnification): Histological images showing the palisading arrangement of histiocytes (arrow) and occasional multinucleated giant cells, fibro-collageneous tissue and areas of calcification, suggestive of a tophus.

Postoperatively, the wound healed uneventfully, and the patient had a full range of motion without any neurovascular deficit, further validating our diagnosis. The patient was discharged with post-operative care instructions and scheduled for follow-up visits to monitor his recovery and ensure the absence of any complications.

Discussion

Gout is a systemic condition related to the metabolism of purines. It leads to elevated levels of uric acid and is characterized by typical, recurrent episodes of arthritis [7], with a prevalence rate of 1 to 4% [8]. A study from the USA (from 1989 to 2009) revealed a twofold increase in the incidence of gout and comorbidities over the 20 years [9]. Similarly, a UK study showed an escalation of the prevalence of gout, from 1.52% to 2.49%, between 1997 and 2012 [10]. With increasing prevalence, complications also had an escalating trend with varying presentation in chronic cases. In our case, a 65-year-old male patient presented with a large elbow mass. It is more than three times more common in males as compared to females.

Chronic tophaceous gout occurs in about 10 years in patients who do not receive treatment, with 12–35% of these individuals developing tophi [11,12]. The cutaneous manifestation of gout is tophi, which is an intradermal lesion or subcutaneous nodule. Typically observed in avascular tissues, it is especially prevalent over the ears, at the olecranon and prepatellar bursae, or in extremity locations, frequently in conjunction with tendons [5].

Extensor surfaces of distal extremities are most commonly involved. It is less commonly present around the elbow, especially when it first appears in an asymptomatic patient. The exact prevalence of elbow tophus is not known [13]. The fundamental pathology involves urate crystals invading and causing the destruction of skin, ligaments, tendons, cartilage, and bone due to an inflammatory response at the affected site.

Differential diagnoses for elbow tophi may include other soft tissue masses, such as lipomas or ganglion cysts, which

can present with similar symptoms but have different characteristics on imaging and histopathological examination.

Uricosuric medications and xanthine oxidase inhibitors can effectively stabilize and decrease tophi size. However, approximately 5%-10% of cases remain unresponsive to such conservative treatments [12]. Especially in large tophus, these therapies took time to act and sometimes years to resolve the tophus when able to maintain serum urate levels low. So, it is not suitable for patients requiring urgent relief like having an infection, neurovascular complications, functional disability, etc. [14]. Our case also did not respond to the medical management.

The surgery is recommended in chronic tophaceous gout in the presence of unsightly painful tophi, infection, impending skin necrosis, ulceration and discharging sinus, impairment of tendon function, painful joint destruction, nerve compression, and cosmesis [15-17]. Surgical treatment of gouty tophi has good results and is the first-line treatment for large tophi and faster relief. Surgical management includes excision, curettage and debridement of tophi. However, it is associated with increased rates of skin necrosis and delayed wound healing due to compromised blood supply [18]. Another surgical technique is the arthroscopic shaver technique, which is helpful for the cosmetic debulking of large tophi in advanced tophaceous gout. It is associated with decreased wound complications and can be done in compromised local skin and infection [19]. Generally, tophi are painless but can be painful when associated with local complications like infection, ulceration and acute gout flare. We did surgical treatment in our case as the mass was tender and progressively increasing despite conservative measures with urate-lowering therapies.

In the surgical technique we use, we take a thick cutaneous flap as much as possible and excise the mass till the triceps is involved, including some part of the tendon. Closure of the wound was done without leaving any dead space with absorbable sutures in deeper tissues; redundant skin was excised and closed using non-absorbable sutures under the drain. A compression bandage was given for one day. We found no wound-related complications or reoccurrence at three months of follow-up However, the patient was counselled about the need for longer and regular followup to observe and manage any recurrence or complication.

Conclusion

We presented a rare case of a large elbow tophi in a patient with chronic gout. Surgical excision was a successful treatment option in this case. Prompt recognition and proper treatment are essential to avoid complications related to tophaceous gout. This case underlines the significance of including tophi in the differential diagnosis when encountering large, unaccounted-for swellings, especially among individuals with a gout history.

Statements and Declarations

Conflicts of interest

The authors declare that they do not have conflict of interest.

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