

## Cytodiagnosis of Gouty Tophi- A Case Report

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### Abstract

### Case Report

Gout is a metabolic disorder characterized by uric-acid crystal-induced arthropathy. Pathologically, the cardinal feature is the deposition of Monosodium Urate (MSU) crystals in and around joints, skin and soft tissue leading to formation of nodules, commonly referred to as tophi. We report a case of a 70 year old male who presented with complaint of swelling and pain over right ankle joint since 7-8 years. There was no history of associated pain any trauma or discharge from the swelling. Gouty tophi presenting as ankle joint swelling is relatively uncommon. Also, the clinical presentation of gout only as painless periarticular nodule is not straightforward FNAC smears are superior to histopathology sections where crystals are more commonly lost during processing and fixation. Hence, FNAC has become the choice of investigation.

**Keywords:** Cytodiagnosis, Gouty, Tophi.

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## INTRODUCTION

Gout is a metabolic disorder characterized by uric-acid crystal-induced arthropathy[1,2]. Pathologically, the cardinal feature is the deposition of Monosodium Urate (MSU) crystals in and around joints, skin and soft tissue leading to formation of nodules, commonly referred to as tophi[3].

## CASE REPORT

We report a case of a 70 year old male who presented to the surgery OPD with complaint of

swelling over right ankle joint since 7-8 years. There was no history of associated pain any trauma or discharge from the swelling. The patient gave history of intermittent pain in the knee joint.

Local examination revealed a 5 x 4.5 cm, soft, non tender swelling over lateral malleolus of right foot. The skin over the swelling was tense, erythematous [Figure1]. No abnormality was detected on systemic examination. Radiology reported the swelling as soft tissue lesion. And the biochemical investigations showed raised uric acid levels.



**Fig-1: Swelling over lateral malleolus of right foot**

Fine Needle aspiration of the swelling was done using a 21 mm gauge needle which yielded a chalky white amorphous material. [Figure2] Alcohol fixed and air dried smears were made from the obtained

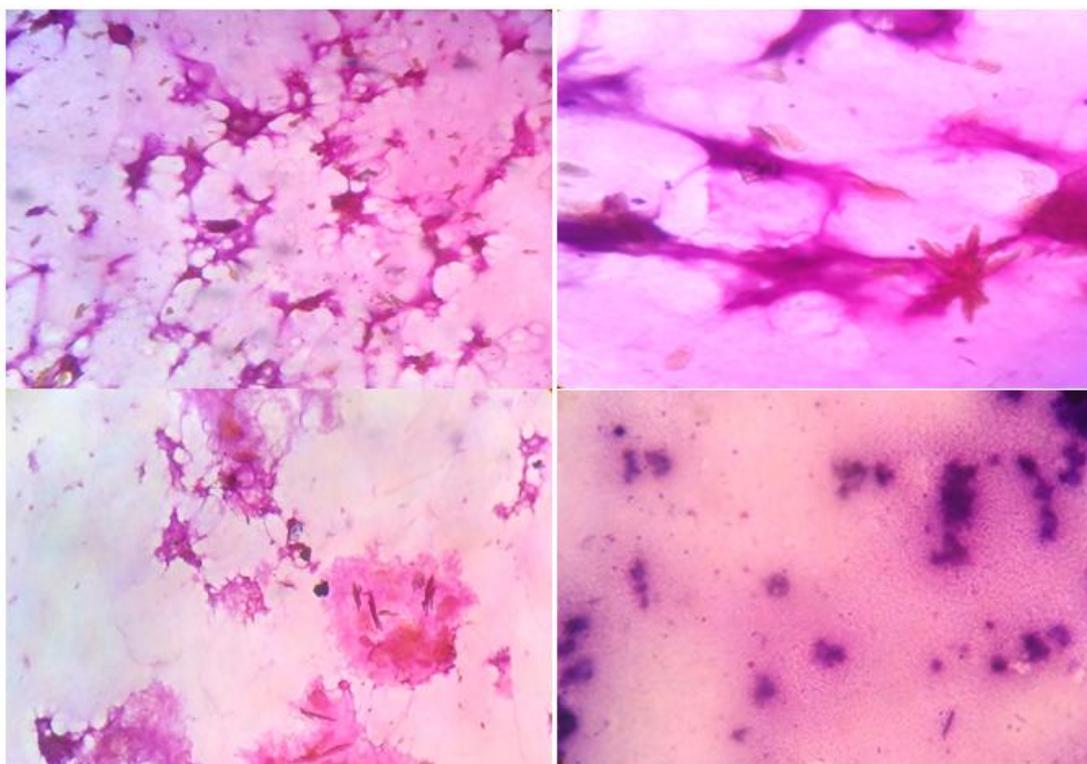
aspirate. Smears were stained with Hematoxylin & Eosin and Giemsa stain. Also, Ziehl-Neelson stain was done to rule out tuberculous etiology.



**Fig-2: Chalky white amorphous material**

Smear microscopy revealed numerous needle shaped crystals arranged in sheaves, rosettes, stacks and many dispersed singly. Background of inflammatory

cells viz neutrophils, lymphocytes, histiocytes and occasional giant cells were seen surrounding the crystals Figure 3.



**Fig-3: Microscopy showing numerous needle shaped crystals arranged in sheaves, rosettes, stacks and many dispersed singly. Background of inflammatory cells viz neutrophils, lymphocytes, histiocytes and occasional giant cells were seen surrounding the crystals**

Provisional diagnosis of crystal induced arthropathy, possibly Gout was made on cytology.

## DISCUSSION

Gout is a disease more commonly found in men than in women and usually occurs during the 5<sup>th</sup> and 6<sup>th</sup> decades of life [3]. Gout is a metabolic disorder

characterized by chronic hyperuricemia, which can be either primary or secondary. Primary gout results from inborn errors of purine metabolism or diminished renal excretion of uric acid. Secondary gout stems from conditions of extensive cell turnover or acquired renal disease.

Presentation of gout varies from acute arthritis, asymptomatic arthritis, gouty tophi, or nephrolithiasis [2-4]. Generally, the disease progresses through four clinical stages, if left untreated: asymptomatic hyperuricemia, acute gout, inter critical or interval gout and chronic tophaceous joint [5].

Gouty arthritis occurs when tissues have been exposed to hyperuricaemia for years. Classically, most common affected site is the first metatarsophalangeal joint. Ankles, knees, wrists and the interphalangeal joints of hands and shoulder may also be affected [3]. Iglesias *et al.* [4] used the term “gout nodulosis” for subcutaneous deposits of MSU without gouty arthritis as initial manifestation.

These tophi are usually seen around joints and subcutaneous tissues, mainly knee joint, olecranon process, achilles tendon, helix of the ear and volar aspect of forearm [2-6]. It is believed that these sites are cooler parts of the body where uric acid crystals get precipitated, therefore these sites have preponderance for gouty tophi [7].

Gouty tophi presenting as ankle joint swelling is relatively uncommon. Also, the clinical presentation of gout only as painless periarticular nodule is not straightforward [2,4].

Clinical differentials for periarticular soft tissue lesions can be –cystic (bursitis), synovial proliferative (giant cell tumor of the tendon sheath), benign neoplastic (lipomas, neurogenic tumors, myxoid tumors), infectious (cat-scratch disease) and deposit diseases (chronic tophaceous gout).

Hyperuricemia is considered a major risk factor for the development of gouty tophi. However, clinicians should be aware that tophi can occur even with normal serum uric acid levels, especially in alcoholic and diabetic patients.

Gouty arthritis does not have any specific radiological features. The radiological features seen are soft tissue masses (tophi), soft tissue swelling and bone erosion which can be seen in many other conditions [7]. Hence, FNAC has become the choice of investigation as it is simple, cheap, and can be done in resource-poor settings.

Morphology of monosodium urate crystals is preserved in alcohol fixed cytology smears. Therefore, examining the cytology smears under light microscopy can make a confident diagnosis in most cases, without the need for polarized microscopy. On cytology, tumoral calcinosis and tophaceous pseudogout formation is differential diagnosis of such swelling [2].

Tumoral calcinosis cytology shows intensely basophilic, amorphous calcified material, whereas gouty tophi reveal needle-shaped crystals. The calcium pyrophosphate dehydrate crystals of pseudogout are much smaller and rhomboid and have weakly positive birefringence in comparison with monosodium urate crystals, which have strongly negative birefringence.

## CONCLUSION

The crystal demonstration in alcohol fixed and H & E stained or air dried and Giemsa stained. FNAC smears is superior to histopathology sections where crystals are more commonly lost during processing and fixation. Some studies have even concluded that urate crystals are best demonstrated using air dried Giemsa/Diff-Quik stain compared to Papanicolaou stain [3]. It is important for the pathologists to be aware of microscopic findings and differential diagnosis of Gouty tophi in FNAC smears.

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