

## Cytodiagnosis of Gouty Arthritis

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### Abstract

Gout is a disorder of uric acid metabolism that causes deposition of Monosodium Urate (MSU) crystals in joint spaces, which, in turn, elicit an acute inflammatory reaction. We present a case in which diagnosis of gout was made by fine needle aspiration of tophus. FNAC of gouty tophus is an easy alternative to synovial biopsy. It is simpler, easier and less painful.

**Keywords:** Gout; Fine needle aspiration cytology (FNAC); Tophus

### Introduction

Gout is a chronic hyperuricemic crystal induced arthropathy. Gouty tophi may be found in synovial membrane, periarticular ligaments, tendons, soft tissues, subcutaneous tissue, achilles tendon and helix of the ear. The definitive diagnosis of gout is best established by demonstration of monosodium urate crystals in the synovial fluid. Fine needle aspiration can play a crucial role in diagnosis. We report the case of a 45 year male presented with painful swelling over great toe, at metatarsophalangeal joint.

### Case Report

A 45 years old male came to medicine outpatient department with painful swelling over great toe at metatarsophalangeal joint. He gave a history of painful arthropathy involving ankle knee and elbow joints. Patient was treated as a case of rheumatoid arthritis in the private hospital since past 10 to 12 years. Local examination of great toe revealed erythematous, soft tendor swelling, measuring 2x2 cm (Figure 1). Serum uric acid level was increased (10.9 mg/dl). Radiograph of foot showed gouty tophus of first metatarsophalangeal joint (Figure 2). Fine needle aspiration of swelling over great toe was performed using 21 mm gauge needle. Aspirate yielded chalky white amorphous material (Figure 3). Alcohol fixed wet smears and



Figure 1: Clinical photograph showing erythematous swelling of great toe.



Figure 2: Radiograph showing gouty tophus of first metatarsal joint.



Figure 3: Aspirated chalky white material from swelling of great toe.

air dried smears made. Alcohol fixed smears were stained with H & E and Papanicolaou stain. They revealed uninucleate, binucleate and multinucleate histiocytes with feathery cytoplasm (Figure 4). Careful attention to the smear background revealed the slender, rod shaped crystals. Flower-like arrangement of crystals was also seen. Unstained cytology smears revealed needle shaped crystals. Polarised microscopy showed negatively birefringent crystals (Figure 5).

### Discussion

Gout is a disorder of uric acid metabolism that causes deposition of monosodium urate crystals in the joint spaces. It often presents with painful joint effusion and commonly is diagnosed either by clinical examination, elevated serum uric acid level or cytological examination of an effusion. Cytological diagnosis of gout is contingent on the identification of the characteristic crystals in joint fluid. With either untreated hyperuricemia or long standing gout characterized by multiple episodic bouts of arthritis, gouty tophi will form in the soft tissues. These typically occur in and around the joint spaces, but may present in other sites as well particularly the pinna of the ear [1].

FNAC of gouty tophi is an easy alternative to synovial biopsy and joint fluid analysis. It is simpler, easier and less painful. As crystals are preserved in stained smears, they can be employed for polarization and confirmation of gout [2].

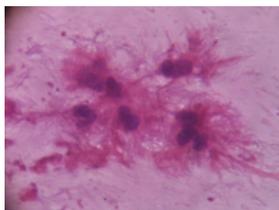
Rao et al. [3] reported a case of gouty tophus with normal serum uric acid level. Measurement of serum uric acid is of limited help in

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**Figure 4:** Photomicrograph of cytology smear showing uninucleate, binucleate and multinucleate histiocytes. Background showing needle shaped crystals (H & E, x400).



**Figure 5:** Photomicrograph of polarised microscopy of cytology smear showing needle shaped crystals (unstained smear, x 400).

the diagnosis of chronic tophaceous gout. The uric acid level may be low or normal due to the uricosuric action of increased blood glucose levels [4].

Gouty tophi presenting as periarticular masses are uncommon and often mistaken for a neoplasm. These nodules may not be recognized as the clinical diagnosis of gout in many instances is not straightforward. In such setting fine needle aspiraton cytology of gouty tophi would facilitate the clinical diagnosis and treatment [5].

In our case we tried polarized microscopy of unstained smears. Crystals were very clearly seen in unstained smears. So unstained smears can also be employed for polarized microscopy.

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