Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Pathology

Gouty Tophus at Unusual Site Presenting As Soft Tissue Mass Diagnosed By Fine Needle Aspiration Cytology with Review of Literature

Monika Garg[1], Malika Gupta[2], Poonam Singal[3], Sachin Nirola[4*]

[1]Associate Professor, Department of Pathology, GMC Patiala, Sangrur Rd, opposite Rajindra Hospital, New Lal Bagh Colony, Patiala, Punjab 147001, India
[2]Junior Resident, Department of Pathology, GMC Patiala, Sangrur Rd, opposite Rajindra Hospital, New Lal Bagh Colony, Patiala, Punjab 147001, India
[3]Assistant Professor, Department of Pathology, GMC Patiala, Sangrur Rd, opposite Rajindra Hospital, New Lal Bagh Colony, Patiala, Punjab 147001, India
[4]Junior Resident, Department of Pathology, GMC Patiala, Punjab, 147001, India

DOI: 10.36347/sjmcr.2023.v11i01.016 | **Received:** 02.12.2022 | **Accepted:** 11.01.2023 | **Published:** 28.01.2023

***Corresponding author:** Sachin Nirola
Junior Resident, Department of Pathology, GMC Patiala, Punjab, 147001, India

Abstract **Case Report**

Fine needle aspiration cytology (FNAC) is becoming a popular clinical practice in diagnosis of soft tissue nodules. We present a case of 58 years old male with bilateral, painless sub cutaneous nodules near the elbow without any clinical and radiological features of arthritis. Serum uric acid levels were found to be marginally high. Fine needle aspiration revealed negatively birefringent needle shaped crystals consistent with monosodium urate crystals in amorphous granular debris. Diagnosis of gouty tophi was given. FNAC is a valuable diagnostic tool for the diagnosis of periarticular nodules and pathologists should be aware of cytological features of gouty tophi, particularly in cases of unusual presentation.

Keywords: Fine needle aspiration cytology (FNAC), Gout, Diagnosis, arthritis.

INTRODUCTION

Gout is a disease caused by overproduction of uric acid. It is a common disease associated with monosodium urate (MSU) crystal deposition in articular or periarticular tissues and in the renal tract [1]. Tophi generally develop with longstanding gout, they rarely develop without preceding acute gouty arthritis. Tophi consist of aggregates of urate crystals with surrounding macrophages, lymphocytes, and giant cells.

Fine needle aspiration cytology (FNAC) is a valuable diagnostic tool and is replacing biopsy for the diagnosis of periarticular nodules [2]. The various differential diagnosis of periarticular nodule include ganglion cyst, pigmented villonodular synovitis, synovial chondromatosis and synovial sarcoma and gout [3]. Diagnosis of gouty tophi at atypical site without hyperuricemia present as diagnostic dilemma. It is important for a pathologist to be aware of differential diagnosis of tophi on cytology.

We are presenting a case in which a primary diagnosis of gout was made by fine needle aspiration. This case emphasizes the importance of considering gouty tophi in the differential diagnosis of soft-tissue masses.

CASE REPORT

A 58 years male with history of chronic alcoholism presented to pathology department with bilateral, painless sub cutaneous nodules near the elbow (Fig 1). Nodules were firm, mobile, non tender. Multiple similar swellings were also present on interphalangeal joints of hands and toes. No other systemic complaint was there. Biochemical investigations showed marginally high uric acid levels. Radiographs of both elbows revealed soft tissue swellings along with small foci of calcification. Underlying bone and articular surfaces appeared normal. No definitive clinical diagnosis was given and the patient was sent for FNAC.

Material aspirated from both the swellings was thick chalky white. Cytological examination revealed amorphous crystalline material and elongated needle like crystals having tapering ends with scattered synovial cells and multinucleated giant cells. Polarizing microscopy of stained and unstained smears by using first order red compensator demonstrated yellow negatively birefringent crystals consistent with MSU. Based on the above findings, diagnosis of gouty tophi was made.

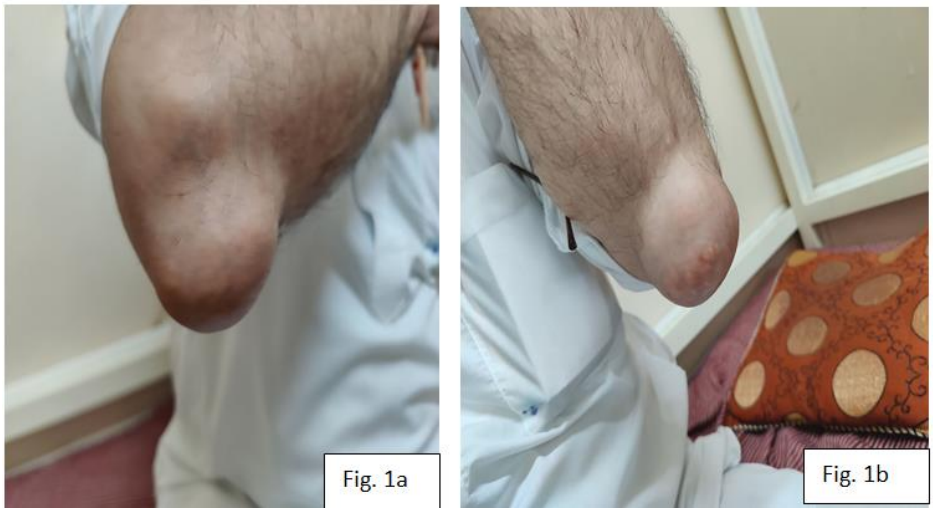

Fig 1(a, b): Clinical photograph showing bilateral subcutaneous nodules near elbow

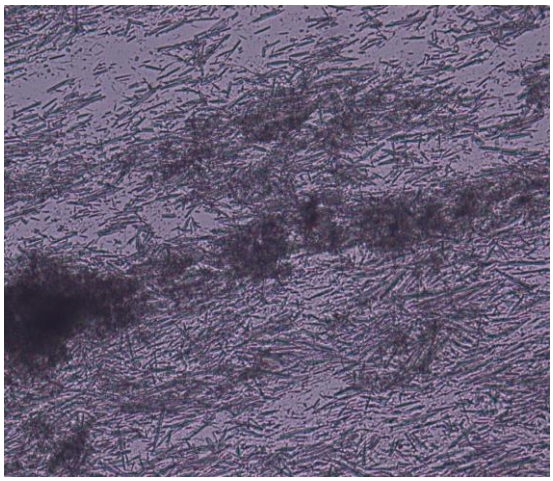

Figure 2: Photomicrograph of cytology unstained smear showing long needle shaped crystals and amorphous debris

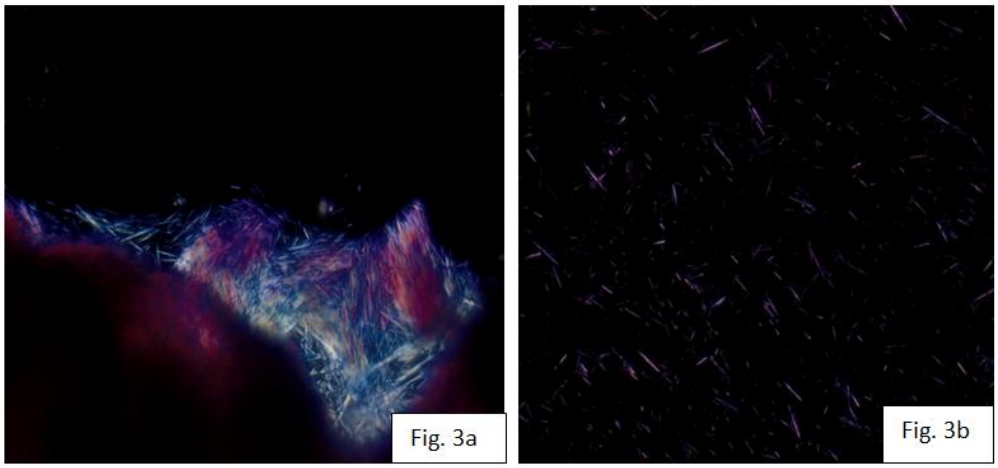

Fig 3(a, b): Photomicrograph of polarized microscopy of cytology smear showing elongated negatively birefringent needle shaped crystals

DISCUSSION

Gout is caused by persistent hyperuricemia. Hyperuricemia may be primary or secondary. Primary is due to inborn errors of purine metabolism or diminished renal excretion of uric acid and secondary is due to acquired renal diseases [1].

When urate accumulates in a supersaturated medium, it can deposit in soft tissues and bones, and form a tophus. Tophi are soft tissue masses usually periarticular, that develop after a long standing gouty arthritis [2]. Soft tissue tophi can be mistaken for neoplasm clinically and radiologically.

Gout usually manifests as acute arthritis but can also present in the form of asymptomatic hyperuricemia, chronic tophaceous gout or nephrolithiasis [3].

Diagnosis of gout is easily made with the presence of arthritis and hyperuricemia. However, arthritis and hyperuricemia may not be present in all the cases. Uric acid levels can be normal or decreased especially in diabetics and alcoholics or in patients with medication including high dose aspirin [4].

FNAC is replacing other investigations due to being quick, less invasive, simpler, and cost effective. The crystal demonstration in FNAC smear is superior to histopathological sections where crystals are more commonly lost during processing [2]. Aspirate in most of the cases is chalky white, particulate, which on microscopy shows amorphous or granular myxoid material composed of MSU crystals with foamy histiocytes, multinucleated giant cells and chronic inflammatory infiltrate [5]. The differential diagnosis includes tumoral calcinosis and tophaceous pseudogout [6]. Both essentially represent soft tissue calcification and hence are picked up on radiology, where radiographic calcification in a gouty tophus is a uncommon finding [7]. Both yield intensely basophilic, calcified material on FNAC. The deposits in tumor calcinosis are amorphous and lack a crystalline structure [4]. Crystals in pseudogout are of calcium pyrophosphate dihydrate and are smaller, rhomboid or needle shaped and have weakly positive birefringence as opposed to MSU crystals of gout, which are longer and needle shaped and have strongly negative birefringence [8].

Other differential diagnosis of polarizable crystals include calcium oxalate, lipids, cholesterol and corticosteroids. Calcium oxalate crystals are bipyramidal, lipid crystals show maltese cross birefringence whereas cholesterol crystals may appear slender needles or rhomboids. Corticosteroid crystals are similar to MSU crystals but other forms such as short rods, plates, fragments and clumps can also be identified along with history of use of corticosteroid injections [9].

Nasser *et al*., mentioned the utility of Diff Quick stain in the evaluation of gouty tophi and recommended the use of air dried smears stained with Diff Quick Romanowsky stain [10]. They did not find Papanicolaou stain to be useful for demonstration of MSU crystals and hypothesized that crystals were lost due to hydration steps involved in staining.

Bhadani *et al*., found crystals in Papanicolaou stained smears as well [11]. Agarwal *et al*., reported a case with multiple soft tissue nodules in feet without any radiological or clinical features of arthritis [3].

Nidhi *et al*., reported a case of gouty tophi with unusual presentation as multinodular, lateral inguinal swelling and no prior medical history of gout and joint pains [2].

Our case also has an unusual presentation with bilateral elbow nodular swelling with no prior medical history of gout and joint pains.

CONCLUSION

Gouty tophus can be the first manifestation of the disease. FNAC is a valuable diagnostic tool in determining the nature of subcutaneous nodules and serves as an alternative to biopsy.

REFERENCES

1. Koley, S., Salodkar, A., Choudhary, S., Bhake, A., Singhania, K., & Choudhury, M. (2010). Tophi as first manifestation of gout. *Indian Journal of Dermatology, Venereology and Leprology*, *76*(4), 393-396.
2. Goel, N., Khanna, V., Jain, D. K., & Gupta, V. (2018). Gouty tophi presenting as multinodular lateral inguinal swelling: A case report. *Diagnostic Cytopathology*, *46*(9), 801-803.
3. Agarwal, K., Pahuja, S., Agarwal, C., & Harbhanjanka, A. (2007). Fine needle aspiration cytology of Gouty Tophi with review of literature. *Journal of Cytology*, *24*(3), 142-145.
4. Rege, J., Shet, T., & Naik, L. (2000). Fine needle aspiration of tophi for crystal identification in problematic cases of gout. *Acta Cytologica*, *44*(3), 433-436.
5. Singh, M., & Chaudhary, J. (2017). Cytodiagnosis of gouty tophi with review of literature. *Int J Contemp Res Rev.*, *8*, 1-6.
6. Owen, D. S. (1992). Aspiration and injection of joint and soft tissues. In Textbook of Rheumatology. Fifth edition. Edited by Kelley, W. N., Ruddy, S., Harris, E. D., Sledge, C. B. Philadelphia, WB Saunders, 591–60.
7. Ishida, T., Dorfman, H. D., & Bullough, P. G. (1995). Tophaceous pseudogout (tumoral calcium pyrophosphate dihydrate crystal deposition disease). *Human pathology*, *26*(6), 587-593.

8. Dieppe, P. A., Crocker, P. R., Corke, C. F., Doyle, D. V., Huskisson, E. C., & Willoughby, D. A. (1979). Synovial fluid crystals. *QJM: An International Journal of Medicine*, *48*(4), 533-553.
9. Liu, K., Moffatt, E. J., Hudson, E. R., & Layfield, L. J. (1996). Gouty tophus presenting as a soft-tissue mass diagnosed by fine-needle aspiration: A case report. *Diagnostic cytopathology*, *15*(3), 246-249.
10. Nasser, I. A., Fayyad, L. M., Soudi, N. M., & Bardawil, R. G. (1994). Fine needle aspiration cytology in the diagnosis of gouty tophi: the role of Diff-Quick stain in the evaluation of unexpected lesions. *Acta Cytol*, *38*(5), 840.
11. Bhadani, P. P., Sah, S. P., Sen, R., & Singh, R. K. (2006). Diagnostic Value of Fine Needle Aspiration Cytology in Gouty Tophi. *Acta cytologica*, *50*(1), 101-104.