

Case report:

Fine needle aspiration cytology (FNAC) of periarticular nodules—an astonishingly effective tool in diagnosis of tophaceous gout

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Abstract

Fine needle aspiration cytology (FNAC) is a very simple and quick out-patient procedure of inserting a thin core needle to aspirate a sample of cells for diagnosing many a superficial lesion over easily accessible portions of the body and few pathological lesions in important internal viscera. Fine Needle Aspiration Cytology (FNAC) has become a simple, inexpensive tool in diagnosis of pathological lesions without seeking recourse to more elaborate time-consuming and invasive techniques such as exploration or open biopsy. Being presented here is a unique case of multiple periarticular gouty tophaceous nodules which are seldom easy to diagnose clinically and radiologically as periarticular tophaceous nodules are not known to have calcification. In the present case, fine needle aspiration has come out as an astonishingly very quick and handy tool in diagnosing of periarticular gouty tophaceous nodules as the patient did not have specific clinical features of gouty arthritis or history of hyperuricaemia, which could have otherwise pointed out to its obvious clinical diagnosis.

Keywords: periarticular nodules, tophaceous nodules, Fine needle aspiration cytology, Gouty tophi, Gout

Introduction

The periarticular swellings over the hands and feet could have different pathogenetic origins, which could be categorized into various conditions like ganglion cysts, pigmented villonodular synovitis, synovial sarcoma, rheumatoid nodules, gouty tophi and synovial chondromatosis^[1,2]. In the absence of clinical history of gouty arthritis or persistent hyperuricaemia with radiological examination of the lesions hardly forthcoming with clear diagnosis since the radiological diagnosis of them pointed out to soft tissue swellings which could have made exploration biopsy of the lesion imperative in an implied hypothetical situation of not having recourse to fine

needle aspiration cytology (FNAC). Here is an interesting case of multiple periarticular nodules in which FNAC came out as a simple, fast and relatively non-invasive and cost-effective procedure to diagnose them as periarticular gouty tophaceous nodules. In the case presented here, a 32 year old male had periarticular nodular swellings over both the feet since 8 months. FNAC conducted on the periarticular nodules and its findings are consistent with gouty tophaceous nodules. The gouty tophi having known to be insidious in onset with no features of secondary calcification and/or the fact that these tophaceous nodules occurring in patients with no evidence of unequivocal features of gouty arthritis or

hyperuricemia, the diagnosis of periarticular gouty tophaceous nodules becomes indeed difficult in some cases^[3]. In one of the difficult cases of its kind presented here, FNAC could act as a simple tool in diagnosis of periarticular gouty tophi as indicated by sheer aspiration of whitish chalky granular material could act as an important clue to the differential diagnosis of gouty tophi.

Case report

A 32 year male presented to the out-patient Department (OPD) with multiple swellings over both feet which were located mainly on the dorsum of the feet around ankle joint and over the periarticular regions of the tarso-metatarsal joints on both the legs. On the left foot the swellings were mainly located around the ankle joint and on the dorsal aspect tarso-metatarsal region which measured around 9cm and 7cm in their greatest dimensions respectively(**Figure 1**), and on the right leg one of the swelling was located on the medial aspect of great toe which measured 4cm in maximum dimension, while another nodular swelling was noted over the superolateral aspect of the dorsum of foot that measured 7cm x 4cm in size (**Figure 2**). On physical examination, the swellings on both the feet were nodular, firm to hard in consistency, non-tender and non-mobile. The patient has past history of having similar swellings over dorsum of both hands which, according to his own observation, reduced on their own over a period of 7 months.

Radiological examination revealed swellings to be of soft tissue origin. No calcification or bony abnormalities were noted. The patient was referred to cytology section for Fine needle aspiration cytology (FNAC) of the swellings.

FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) OF THE SWELLINGS

Fine needle aspiration cytology (FNAC) was carried out on the swellings over both the feet by using 22-gauge needle with all the aseptic precautions. Fine needle aspiration of the larger swelling yielded one millilitre of chalky white granular and amorphous material. Aspirated material from other nodules was also similar in its contents (**Figure 3**). Multiple smears were prepared from the aspirated material and were stained with routine cytological stains such as Giemsa and Papanicolaou stains.

The microscopic examination of the smears revealed marked hypocellularity and showed predominantly scattered amorphous debris amidst which were seen multiple sheaves, sheets and stacks of multiple needle-like structures which were variably refractile. Numerous diffusely scattered slender refractile needle-like crystals were also noted along with few degenerated mononuclear cells (**Figures 4 and 5**).

Under polarizing microscopy, the sheaves, sheaths and stacks of needle like crystals appeared colourless to pale blue and birefringent with focal areas showing clearly radiating slender needles. At places, singly scattered needle-like structures were pale blue to colourless and birefringent. Some of the larger fluffy and fibrillary fragments showed sheaves and stacks of closely packed needle-like structures arranged in delicately feather-like manner(**Figures 6 and 7**).

Discussion

Gout, a metabolic disorder leading to a type of crystal arthropathy, is known to occur due to persistent chronic hyperuricemia which can be either primary as a result of inborn errors of purine metabolism or diminished renal excretion of uric acid and which can also occur secondary to pathological conditions with extensively increased cell turn over that lead to excess production uric acid or as a result of acquired renal disease.^[4,5] Heavy alcohol intake, overzealous

use of diuretics and analgesics (mainly acetylsalicylic acid), purine-rich diet, obesity, hypertension, and renal compromise are known to be predisposing factors^[6]. It is known that Gout generally manifests through four phases in its evolution: asymptomatic hyperuricemia, acute Gout, intercritical or interval Gout and tophaceous Gout. The diagnosis of Gout becomes difficult when the presentation is atypical and asymptomatic with no antecedent history of Gouty arthritis or when the serum uric acid levels are borderline ^[7]. Sometimes, presentation as periarticular tophaceous nodules could be the first manifestation of Gout ^[8, 9]. Though the differential diagnosis of periarticular nodules includes rheumatoid nodules, ganglion cysts, pigmented villonodular synovitis, tumoral calcinosis, synovial chondromatosis and synovial sarcoma ^[10], the most problematic differential diagnoses include other crystal deposit diseases such as pseudogout and tumoral calcinosis. In case of tumoral calcinosis or calcinosis cutis, FNAC findings reveal scattered intensely basophilic amorphous material in contrast to distinctly slender needle-like crystals, mostly

compactly arranged in sheaves and stacks. Pseudogout is characterized by deposition of calcium pyrophosphate dehydrate (CPPD) crystals which are shorter, rhomboid or needle-shaped with weakly positive birefringence while monosodium urate (MSU) crystals are longer, slender needle-shaped crystals scattered singly and in stacks and sheaves and have strong negative birefringence which helps in establishing the diagnosis of gouty tophus unequivocally^[11-13]. The fact that urate crystals are often lost during processing of biopsy specimens because of their tendency to dissolve in formalin solution makes FNAC of periarticular tophaceous nodules a preferred and popular procedure^[14].

Conclusion

Fine needle aspiration cytology (FNAC), being simple, quick and relatively non-invasive method that could be employed as out-patient procedure, which has got an added advantage of preserving monosodium urate (MSU) crystals in alcohol-fixed smears than in histological processing of biopsy specimens, makes it an astonishingly effective tool in the diagnosis of tophaceous gout.



Figure 1. Left foot with swellings over around the ankle joint and dorsum of foot.



Figure 2. Right foot with swellings over the medial aspect of great toe and superolateral aspect of dorsum of foot.

Figure 3. Chalky white, granular and amorphous contents of the needle aspirate of the swellings.



Figure 4. Multiple sheaves and sheaths and singly scattered needle-like crystals (Geimsa, 40X)

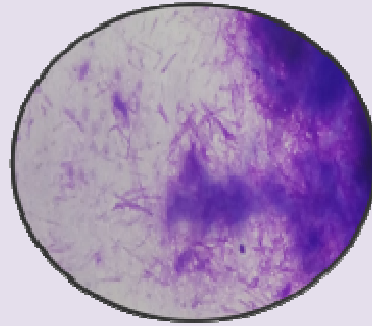


Figure 5. Multiple sheaves and stacks of compactly arranged needle like structures (Pap, 40X)

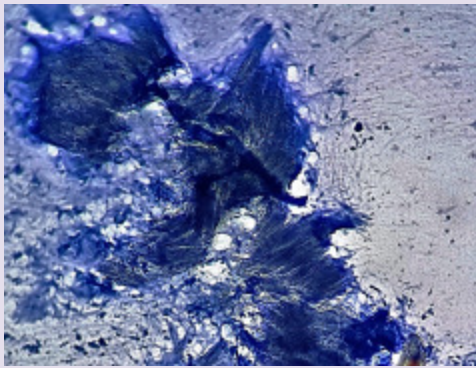


Figure 6. Blue birefringent crystals seen in closely arranged clumps (40X).

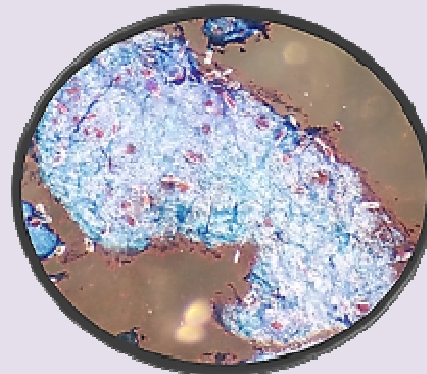
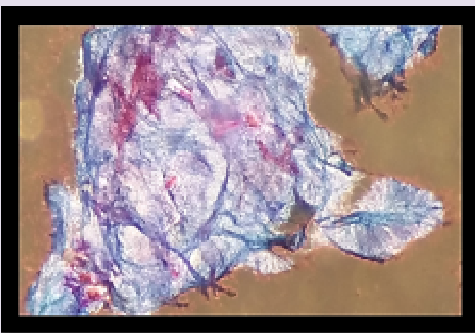


Figure 7. Fragments of tophaceous structures showing distinctly radiating pale blue birefringent needle-like crystals.



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