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Original Article

Fine Needle Aspiration Cytology of Musculoskeletal Lesions

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Abstract

Objectives: Study the role of fine needle aspiration cytology (FNAC) in diagnosis of musculoskeletal tumors and tumor like lesions.

Study Design: Descriptive cross sectional .

Place and Duration: Abbas Institute of Medical Sciences and Pathology department of AJKMC from July 2013-October 2014.

Materials and Methods: Twenty three patients who presented in orthopedic surgery outpatient with history of pain and swelling were examined along with radiological correlation. The fine needle aspirations were performed subsequently on a suitable site in the swelling. The smears were examined by a consultant pathologist with special interest in cytopathology.

Results: The adequate aspirates (22/23) contained well preserved individual as well as clusters of cells displaying the morphological features identical to the histopathological features making it possible to render definite diagnoses. The diagnoses represented broad spectrum of inflammatory, benign and malignant neoplastic lesions.

Conclusion: Fine Needle Aspiration Cytology of osseous and soft tissue lesions is quite accurate and rewarding as it may obviate unnecessary surgery in some cases and may help in planning the surgery in other cases.

Key words: Fine needle aspiration cytology, musculoskeletal tumors, tumor like lesions, soft tissue tumors.

Introduction

Musculoskeletal tumors and tumor like lesions is broad term in which both bony & soft tissue tumors (benign, malignant) are included with tumor like lesions of infective etiology. Though open surgical biopsy is investigation of choice but many disadvantages are associated with it. Fine Needle Aspiration Cytology (FNAC) is now becoming more and more popular as it is simple, very easy, safe and cost effective procedure. The rate of accuracy of FNAC in musculoskeletal tumors and tumor like lesions is increased with radiological correlation. The diagnostic triad includes clinical finding, radiological evaluation and FNAC. Fairly good guess can be made on plain X-rays biopsy is required to make definite diagnosis.[1] FNAC had replaced the open biopsy in many cases as it does not requires hospitalization, avoids contamination of surrounding tissues with an associated risk of infection, hematoma formation and pathological fracture.[2] FNAC is inexpensive, almost painless and quick. Multiple passes can be made and adequacy of the specimen can be quickly assessed.

The present study is undertaken to assess the reliability of FNAC, so that it can be used as reliable replacement for core needle/ open biopsy.

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Materials and Methods

Twenty three patients with musculoskeletal swellings were examined at Abbas Institute of Medical Sciences. Previously diagnosed and post operative cases were not included. Detailed clinical history was taken followed by thorough clinical examination; important points noted were duration, site, extent, number, size and consistency of lesion. Patients were referred to radiology department for x rays, radiological interpretation and preliminary working diagnosis. It was based on findings (bony lesion/ soft tissue mass, lytic/sclerotic, periosteal reaction, cortical destruction, calcification).

Suspected malignant cases were further evaluated by MRI (local extent), X-Ray chest and CT scan chest for metastasis.

FNAC was performed in the pathology department with aseptic technique by experienced pathologist. 10cc-20cc syringes with 21-23 gauge needles were used. Smears were spread over glass slides. Some smears were air dried and other smears were fixed in absolute alcohol

Results

One aspirate was inadequate. In twenty two patients age range was from 15 to 55 year. Male patients were 16. The distribution of the lesions are given in **Graph 1.**

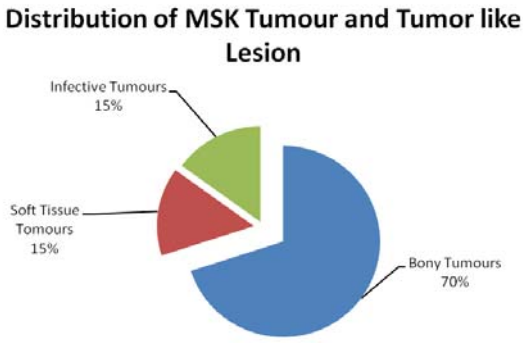

Table 1. Site of bony lesions

Bone	Numbers
Clavicle	2
Humerus	4
Radius	1
Phalanges	5
Femur	3
Tibia	3
Tarsal	2
Metatarsal	2

Table 2.Tumour and tumour like lesions

Lesion	Numbers
Synovial Sarcoma	2
Osteomyelitus	3
Simple Bone Cyst	2
Aneurysmal Bone Cyst	3
Giant Cell Tumour	1
Chondroma	1
Osteo Chondroma	2
Chondro Sarcoma	2
Ewings sarcoma	1
Osteo Sarcoma	2
Epithelioid sarcoma	1
Villondular tenosyovitis	1
Tuberculous osteomyelitis	1

Microscopic Descriptions: The smears generally recapitulated the histopathology counterpart. The aneurysmal bone cyst aspirates contained dilated & congested thin capillaries with an occasional macrophages. (Figure1).

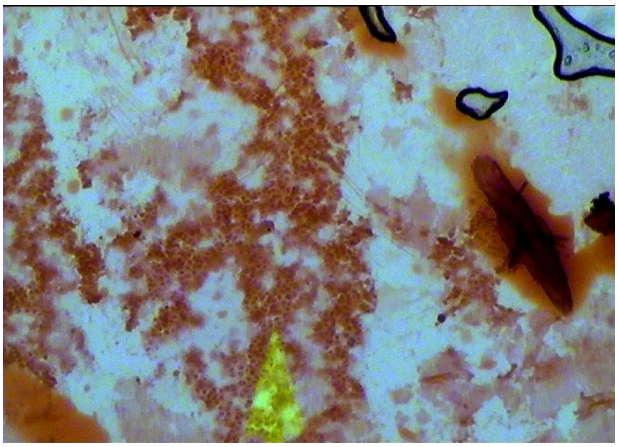

Figure 1: Bony Trabeculae with Dilated Capillaries Containing Blood – Aneurysmal Bone Cyst (H&E X100)

The villonodular tenosynovitis aspirates contained clusters of plump benign synovial cells. (Figure 2) The osteochondrmas contained cartilaginous cap with underlying osseous trabeculae while sarcomas contained atypical and pelomorphic nuclei containing cells. (Figure 3) Chondrosarcoma contained atypical chondrocytes while osteosarcoma contained osteoid wit malignant osteoblasts. Simple abscesses contained numerous neutrophils while tuberculous lesions contained

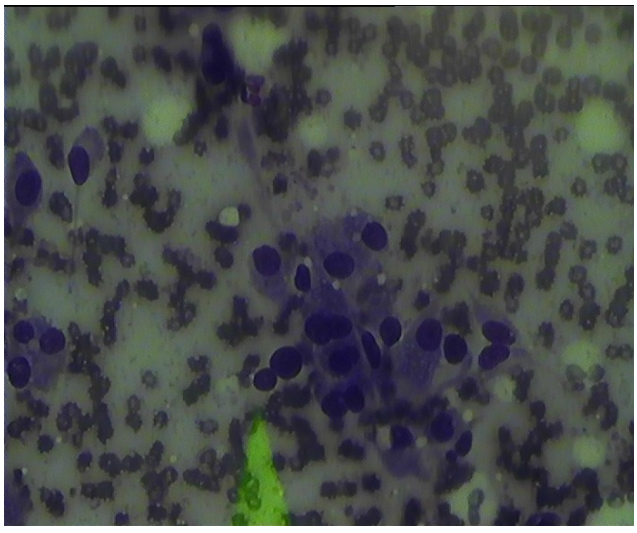

Figure 2: Benign synovial cells arranged in Groups Villonodular tenosynovitis (H&E X400)

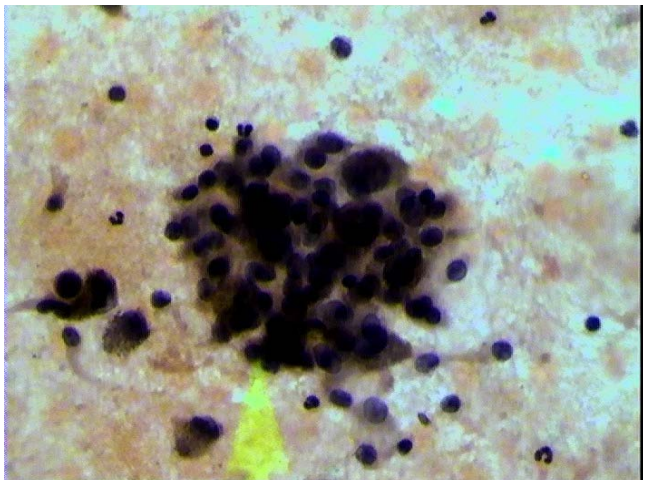

Figure 3: Atypical Synovial Cell – Synovial Sarcoma (H&E X 400)

Discussion

FNAC was used for diagnosis of bone tumour as early as 1930, but at that time it was limited for only metastatic lesions and not for primary tumours[3,4] Diagnostic discrepancies in most of cases are due to inadequate aspirate and poor clinico-pathalogical correlation. We overcome this problem by taking at least two to three aspirates and adequate clinic-radiological correlation. In our study we diagnosed 22 cases accurately, however discrepancy in one case was found because of in adequate aspirate. Most of cases were followed with histopathalogical correlation; however it was not possible in all cases because of limited resources, poor patient compliance and in cases of advanced metastatic disease where surgery was not preferable.

The site for aspiration in all cases were selected on clinical finding and on x ray guidance, however it was not done under high frequency ultrasound, floroscopic and CT guidance because of unavailability of these modalities in our setup.

Diagnostic accuracy of FNAC in our study was 95% which is comparable to study by Chakrabartis in which diagnostic accuracy was 93.1%.[5] It is higher than study of Kreicbergs et al.1996 in which accuracy was 80%[6].

The patients who were benefited by FNAC were the cases of tumors like lesions, which were proved of infective etiology and were treated by antibiotics and curettage.

The common benign tumors were aneurysmal bone cyst and giant cell tumors, while common malignant tumor was osteosarcoma[7]

It is emphasized that with advancement in radiological modalities, preliminary diagnosis of musculoskeletal tumors have been improved but FNAC may provide the definite diagnosis.

Conclusion

FNAC can be employed with good clinical and plain radiological input for preliminary diagnosis in patients with musculoskeletal tumors and tumors like lesions. Where aspirates are inadequate or results are doubtful a trucut or open biopsy may be considered.

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