Original Article

Received on 27.09.2016, **Accepted on** 08.10.2016

Indian Journal of Pathology: Research and Practice
Volume 5 Number 3, September - December 2016
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.5316.15

Bone Tumors: Cytological and Histopathological Correlation and Comparitive Analysis with Various Studies

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Abstract

Aim: To determine the spectrum of various bone tumors as observed on fine needle aspiration cytology and to correlate the same with histopathological examination. *Materials and Methods*: 20 cases were studied over a period of 3 years.Patients of both sexes and all age groups with clinico radiological suspicion of bone tumors were subjected for FNAC.Histopathological examination was carried out in patients who subsequently underwent biopsy and tumor excision.Finally correlation of FNAC findings with histopathology was done. *Results:* The age group affected ranged from 13-80 years.Males (60%) were affected more than females (40%) with M:F ratio of 1.5:1.Pain and swelling were the most common clinical features. Benign tumors (65%) were documented more than malignant tumors (35%).Giant cell tumor was most common tumor. Histopathological correlation was done in 14 out of 20 cases and out of 14 cases positive correlation seen in 13 (92.8%). *Conclusion:* FNAC should be considered as a diagnostic tool in the initial workup of skeletal tumors used for the preliminary diagnosis of bone tumors. Great diagnostic aid especially in developing countries like India. Alleviates the need for open biopsy and helps in initiating appropriate therapy faster. FNAC of bony masses have a high diagnostic accuracy especially when sampling is adequate.

Keywords: FNAC; Bone Tumours; Histopathology.

Introduction

Tumors of skeleton develop in all age groups, affect any bone in the body and can be benign or malignant.The definite diagnosis is based on the histopathological examination. As these are associated with high mortality and morbidity, early and accurate diagnosis should be done.

This need was fulfilled by the advent of FNAC as a tool in the diagnosis of bone lesions. FNAC has not been widely applied in the diagnosis of bone tumours.But in recent times it is becoming more accepted as a substitute for traditional open biopsy. Same diagnostic accuracy as histopathology. FNAC material can be sent for other ancilliary studies. There is enhancement of the role of FNAC in the management of metastatic as well as primary malignant bone tumours.Percutaneous needle biopsy is also a major tool in the diagnosis of MSK lesions [1] but it also carries the risk of bleeding, infection, pneumothorax, spinal cord compression and neurologic injury. There is a small increase in fracture risk following bone biopsy, particularly in weight-bearing bones as the femur [2,3]. Cytologic assessment with clinical and radiographic findings, together with the experience of cytopathologist can almost the same diagnostic accuracy as histopathology of subsequent open biopsies in majority of lesions [4].

Also FNAC material can be sent for other studies i.e. immunohistochemistry, electron microscopy, cytogenetics, microbiological analysis etc. as and when required.

Easy retrieval of diagnostic material for successful cytomorphologic and microbiologic assessment makes FNAC the procedure of choice in diagnosis of bony lesions [5].

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Materials and Methods

This study was carried out in the Pathology department, in a tertiary care hospital in salem district over a period of 3 years. It was a descriptive study. The total number of cases included in this study was 20. Patients of both sexes and all age groups with clinico radiological suspicion of bone tumours were included. Tumor like conditions, cases with inadequate material, lesions with compact bone were excluded. In all the cases FNAC was performed using either a 23 or 24 gauge needle. The smears were made and fixed in alcohol and slides stained with eosin and hematoxylin. The slides were viewed under light microscope and diagnosis made. Histopathological examination was carried out in patients who subsequently underwent biopsy and tumour excision. Finally correlation of FNAC findings with histopathology was done.

Results

There were 20 patients in this study. The age group affected ranged from 13-80 years.Males (60%) were affected more than females (40%) with M:F ratio of 1.5:1. Pain and swelling were the most common clinical features.

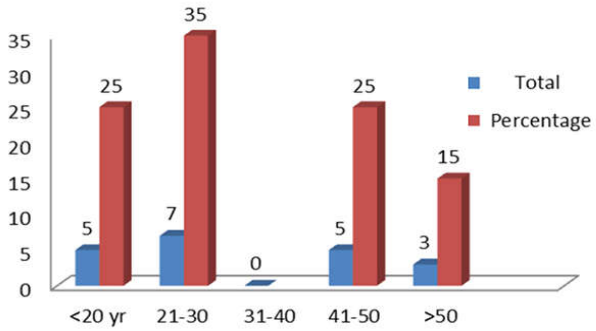

Chart 1: distribution of age in bone tumors

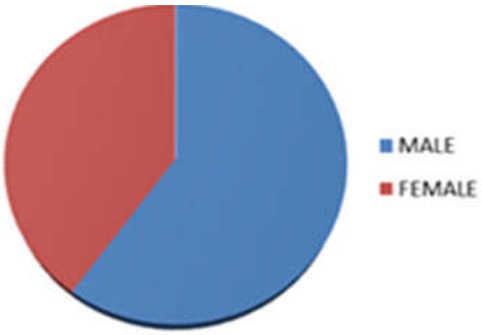

Chart 2: Sex distribution in bone tumors

Table 1: Types of bone tumors

Types of Tumor	No. of Cases	Percentage
Primary Tumors Benign		65%
Osteoid osteoma	1	
Ospeoblatoma	1	
Enchondroma	2	
Osteochondroma	2	
Giant cell tumor	7	
Malignant		35%
Osteosarcoma	2	
Chondrosarcoma	2	
Fibrosarcoma	1	
SECONDARY(Metastatic) TUMORS:	1	
Carcinoma thyroid	1	
Carcinoma prostate		
Total	20	100%

Cytological diagnosis of malignant tumors made in 7 patients (35%) followed by benign tumors in 13 patients (65%).

Giant Cell Tumor was most common tumor accounting for 7(35%) cases.4 patients were female (57.1%) and 3 were male (42.9%).The most common site affected was lower end of femur in 3 patients followed by upper end of tibia in 2 patients.the other site involved were lower end of radius and upper end of fibula in one patient each.

The aspirates were good and on morphology, celluarity was moderate to high showing bimodal population of mononuclear cells and numerous giant cells. The cytological diagnosis of giant cell tumor was confirmed by histopathology in all 7 cases, in one case features of Anerusymal bone cyst also seen.

Malignant Tumours

Osteosarcoma

Metastatic lesions: In the present study,metastatic lesions diagnosed in 2 patients.one is 75 yr presented with pain and right clavicle swelling and another 55yr

Aspirate hemorrhagic in boyh cases.cellularity is good showing The primary suspected to be of prostate and thyroid.

Histopathological correlation was done in 14 out of 20 cases and out of 14 cases positive correlation seen in 13 (92.8%).

Table 2: Correlation of fnac diagnosis of bone tumors with histology

Types of Tumor	No. of cases	Cytohisologically Consistent	Diagnostic Accuracy
Osteoid osteoma	1	1	100%
Osteochondroma	1	1	100%
Giant cell Tumor	7	7	100%
Osteosarcoma	2	1	50%
Chondrosarcoma	2	2	100%
Fibrosarcoma	1	1	100%
Total	14	13	92.8%

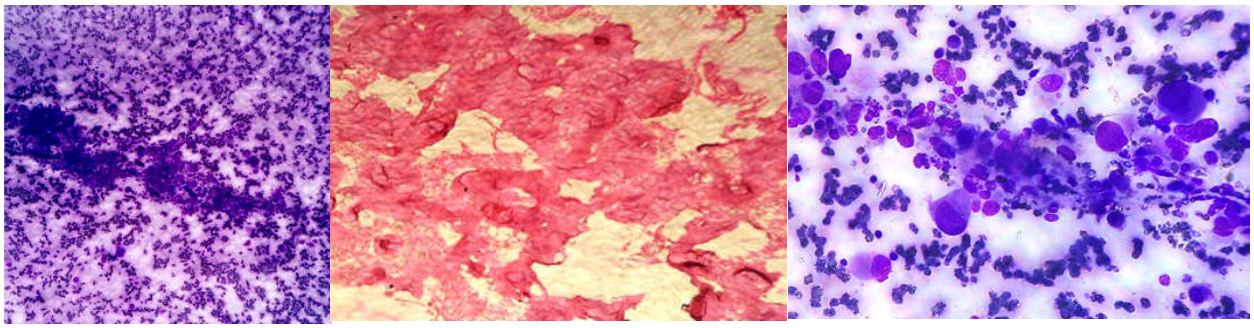

Fig. 1: Osteosarcoma

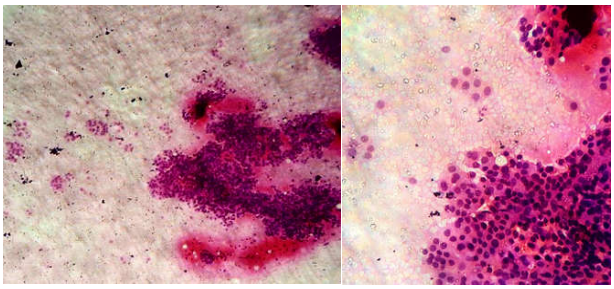

Fig. 2: Carcinoma thyroid metastasing to the clavicle

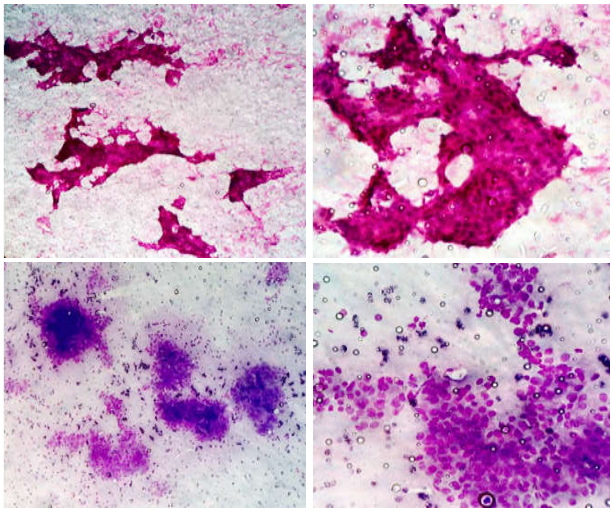

Fig. 3: Carcinoma prostate metastasing to the iliac bone (h & e)

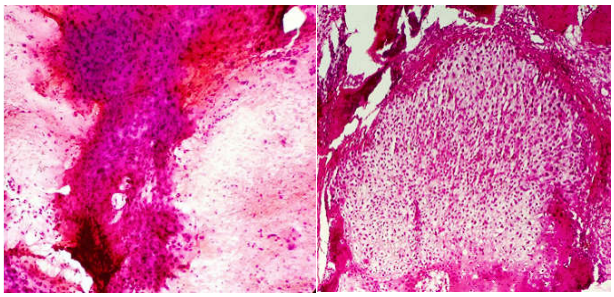

Fig. 4: Chondrosarcoma

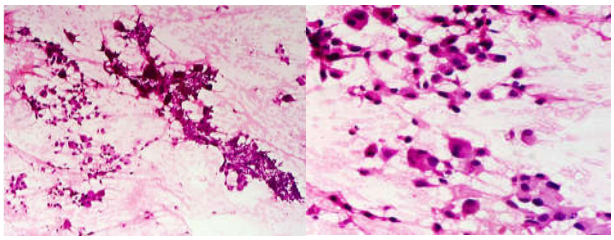

Fig. 5: Osteoblastoma

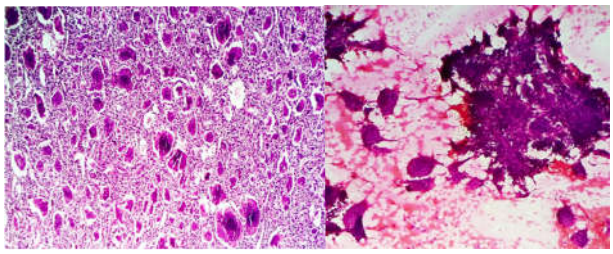

Fig. 6: Giant cell tumour

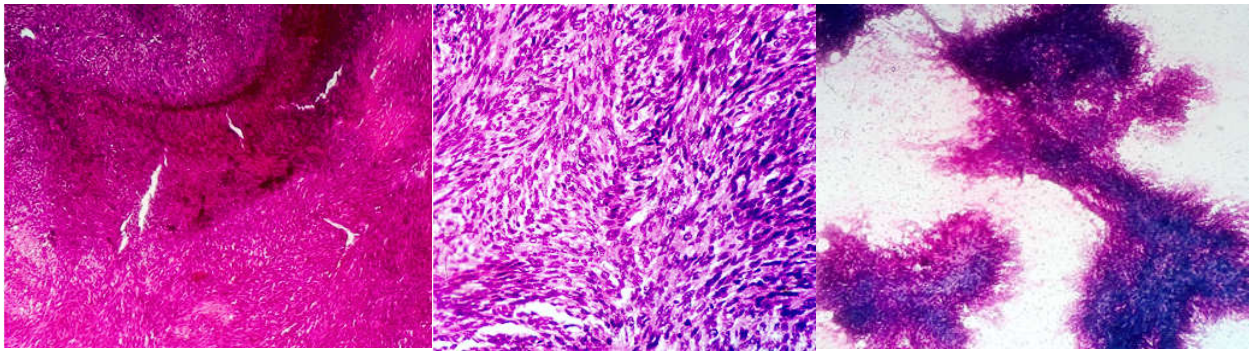

Fig. 7: Fibrosarcoma

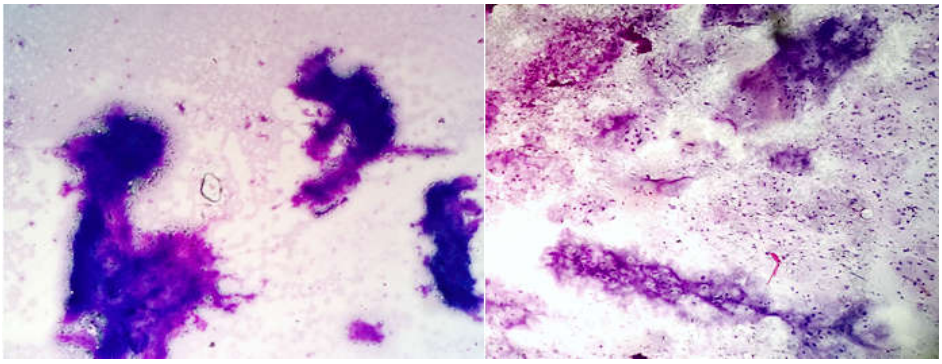

Fig. 8: Osteochondroma

Table 3: Comparision with Various Studies

Studies	Rana Sherwani et al[6]	Obiageli ENnodu et al[7]	Sudipt Chakrabarti et al[8]	Present study
Age group	6-80 yrs	4-76 yrs	10-78 yrs	13-80 yrs
M:F Ratio	1.6:1	1.5:1	1.8:1	1.5:1
Site	Femur	Femur	Femur	Femur
Clinical features	Pain, swelling	Pain, swelling	Pain, swelling	Pain, swelling
M.C tumor	GCT	GCT	Osteosarcoma	GCT
Benign vs malignant	M>B	M>B	M>B	B>M

Table 4: Comparison of cytohistological correlation of present study with other studies

Studies	Cytohistological Correlation
Rena shervani et al[6]	93%
Ambreen Moatasim[9]	94%
Chandanwale Shirish et al[10]	92.5%
Sudipta Chakrabarti et al[8]	92.86 Benign 93.34 Malignant
Meerut;Verma et al [11]	94%
PRESENT STUDY	92.8%

Discussion

The individuals In our study the most common clinical presentation was pain and swelling which is similar to the studies done by Rana Sherwal et al [6], Obiageli E Nnodu et al [7] and Sudipa chakrabarti et al [8]. Giant cell tumor of bone constituted the maximum number of cases i.e. 15. These were clinico-radiologically suggested as giant cell tumor, but cytologically 13 could be confirmed as G.C.T. while two of these after histology were diagnosed as fibro-osseous lesions. The cytohistological correlation in present study is 92.8% which is comparable to studies by Rana Sherwal et al [6],Murphy et al,Chandanwale Shirish et al [10] and Sudipa chakrabarti et al [8].

Conclusion

FNAC should be considered as a diagnostic tool in the initial workup of skeletal tumors used for the

preliminary diagnosis of bone tumors. Great diagnostic aid especially in developing countries like India. It alleviates the need for open biopsy and helps in initiating appropriate therapy faster. FNAC of bony masses have a high diagnostic accuracy especially when sampling is adequate.

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