

ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) AS DIAGNOSTIC TOOL IN BONE TUMOURS

Dr. Sridhar Reddy Bodhireddy¹, Dr. G.Sobha Rani²

¹Associate Professor, Department of Pathology, SV Medical College, Tirupathi, A.P.

²Associate Professor, Department of Pathology, Government Medical College, Kadapa, A.P.

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Corresponding author: Dr. G.Sobha Rani, Associate Professor, Department of Pathology, Government Medical College, Kadapa, A.P.

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Abstract

Fine needle aspiration cytology (FNAC) is a highly effective procedure in diagnosing the bony problems. It is a simple low cost, relatively a painless procedure. The cases were categorized based on cyto- morphological features of aspirate.

Aim: The aim of the study is to evaluate the diagnosis and to differentiate the primary bone tumour like lesions.

Materials and Methods: The present study was conducted on 58 cases of bone tumours during a three years period (2015 - 2018) in department of pathology, Government medical college, Kadapa.

Requirement of materials: 10 ml disposable syringe with 22-25 G needle, suitable fixative is Isopropyl alcohol, Alcohol fixed slides were taken for Haematoxylin and Eosin (H&E) stain.

Results: In the present study we registered 58 cases. Among these, 36 (62.06%) cases were Osteoclastoma, 20(34.4%) were Osteo sarcoma, 2 (3.44%) were Ewing's sarcoma. The predominant age group in Osteoclastoma is 21-30 years, in Osteosarcoma 41-50 years, in Ewing's sarcoma 11-20 years group. Male to female ratio in Osteoclastoma is 8:1, in Osteosarcoma 9:1, Ewing sarcoma 1:1.

Keywords: FNAC, Bone tumours to evaluate benign and malignant tumours of bone

Introduction:

Fine needle aspiration cytology (FNAC) is a highly effective procedure in diagnosing the bony problems. It is a simple low cost, relatively a painless procedure. The cases were categorized based on cyto- morphological features of aspirate. Multiple punctures were done with the help of X-ray findings. In most of the cases cortical bone was destroyed and hence there was no difficulty while passing through the lesion in FNAC procedure.

Martin and Ellis [1] first applied this technique to the diagnosis of bone lesions in 1930. Since then, several published series have yielded overall accuracy values ranging from 51% to 100%. [2-6] However it is yet to be established how accurately FNAC can give conclusive diagnosis of bone tumours. There is no clear consensus yet whether FNAC can be the final and definitive investigation to diagnose a skeletal neoplasm or deny its possibility.[7]

MATERIALS AND METHODS:

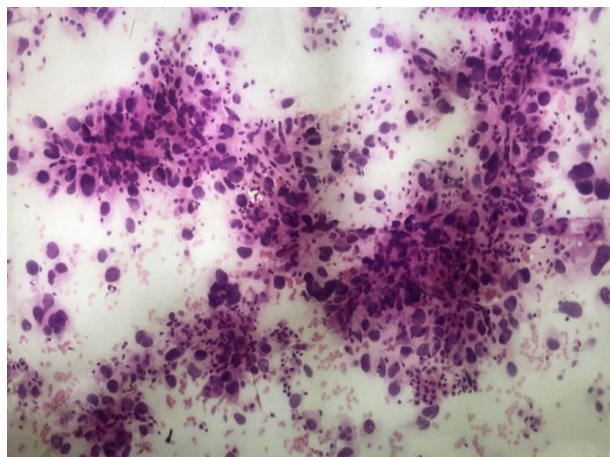
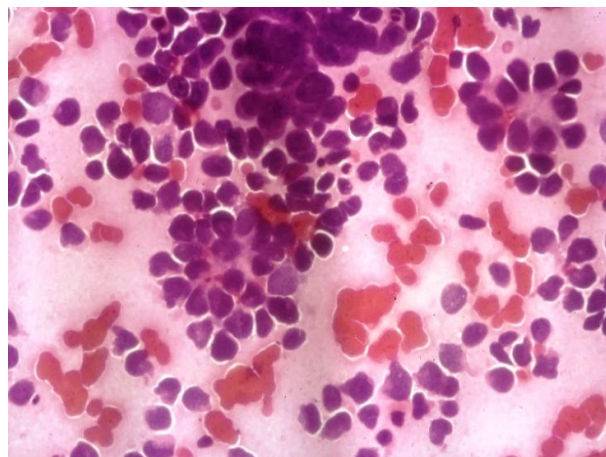
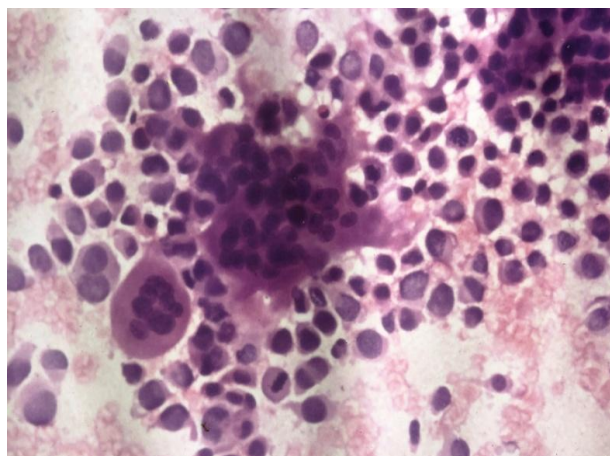
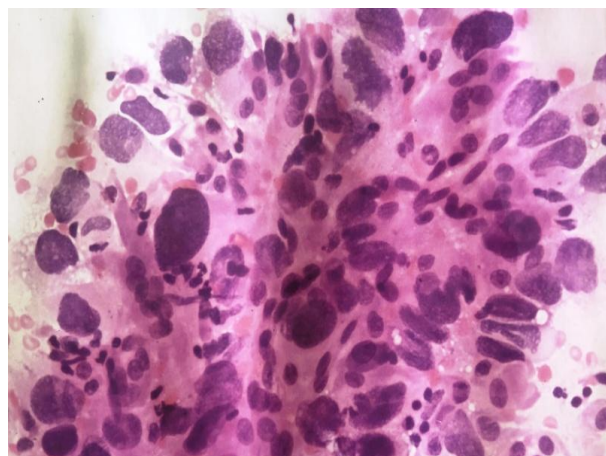
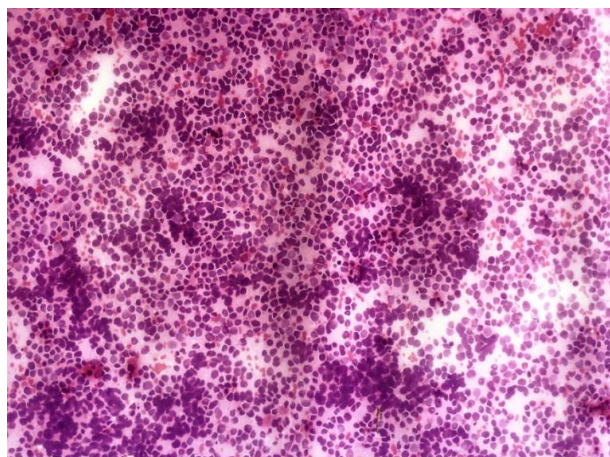
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RESULTS

In the present study we registered 58 cases. Among these, 36 (62.06%) cases were Osteoclastoma, 20(34.4%) were Osteo sarcoma, 2 (3.44%) were Ewing's sarcoma. The predominant age group in Osteoclastoma is 21-30 years, in Osteosarcoma 41-50 years, in Ewing's sarcoma 11-20 years group. Male to female ratio in Osteoclastoma is 8:1, in Osteosarcoma 9:1, Ewing sarcoma 1:1.

Table 1: Age and Sex incidence of Bone lesions

Type of Lesion	0-10 Yrs		11-20 Yrs		21-30 Yrs		31-40 Yrs		41-50 Yrs		51-60 Yrs		> 61 Yrs		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Osteoclastoma					28	02	04	02							32	04
Osteosarcoma									18	02					18	02
Ewing's sarcoma			01	01											01	01

**Figure 1: 10x Osteosarcoma****Figure 4: 40x Ewing's Sarcoma****Figure 2: 40x Osteoclastoma****Figure 5: 40x Osteosarcoma****Figure 3: 10x Ewing's Tumor**

DISCUSSION

FNAC of bone and cyto diagnosis are now well established methods. According to Mercejorda et al [8], Cyto diagnosis were classified in to four categories. 1.Primary bone lesions 2. Metastatic bone lesions 3. Suspicious for malignancy 4. Negative cases. Present study shows Osteoclastoma- 62.06%, Osteosarcoma 34.4%, Ewing sarcoma 3.44%. According to study conducted by Mercejorda et al [8], Primary bone lesions were sub classified in to four categories. 1. Inflammatory, 2. Tumour like, 3. Benign and low grade tumours, 4. Primary malignant tumours.

In the present study, among the primary bone lesions, majority are primary malignant bone tumours. Similarly in the study conducted by Mercejorda *et al* [8], primary malignant bone tumours.

Categorising cartilage lesions into benign and malignant groups posed particular difficulty in our study. Hypercellularity, plump nuclei, more than occasional binucleate cells, a permeative pattern, and entrapment of bony trabeculae are some of the features that diagnose a malignant bone tumours cannot be conclusively observed in fine needle aspirations. Three of our seven cases in the doubtful group consisted of these lesions. Other lesions that can have confusing features in aspirated smears are those which reveal giant cells under the microscope. Whereas the presence of the cohesive mononuclear cells amidst giant cells suggests an osteoclastoma, the absence of same opens the possibility of several lesions eg aneurysmal bone cyst, brown tumour of hyperparathyroidism, chondroblastoma etc..[7].

A study done by Wahane *et al* [9] reported that, FNAC could differentiate between various round cell tumors such as Ewing's sarcoma and myeloma, among various giant cell-rich lesions of bone and between the benign and malignant chondroid bone tumors. Some uncommon variants were also correctly diagnosed. In metastatic bone tumors, the source of primary malignancy could not be indicated in the majority (52.9%) because of the poorly differentiated morphology. Osteoid or osteoid-like material was demonstrable in 63.6% cases of osteogenic sarcoma. A case of chondroblastic osteogenic sarcoma that was reported as chondrosarcoma was the only diagnostic error in the study. FNAC obviated the need of open biopsy in 63.8% patients, and therapeutic decisions were made according to the cytologic diagnoses.

CONCLUSION

FNAC has a vital role in diagnosing the bone tumours and to differentiate benign and malignant tumours. In the present study we registered 58 cases. Among these 36 (62.06%) cases were Osteoclastoma, 20(34.4%) were Osteosarcoma, 2 (3.44%) were Ewing's sarcoma. The predominant age group in Osteoclastoma is 21-30 years, in Osteosarcoma 41-50 years, in Ewing's sarcoma 11-20 years group. Male to female ratio in Osteoclastoma is 8:1, in Osteosarcoma 9:1, Ewing sarcoma 1:1.

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REFERENCES

1. Martin HE, Ellis EB. Biopsy by needle puncture and aspiration. *Ann Surg* 1930; 92: 169–81.
2. Coley BL, Sharp GS, Ellis EB. Diagnosis of bone tumors by aspiration. *Am J Surg* 1931; 13: 213–24.
3. Snyder RE, Coley BL. Further studies on the diagnosis of bone tumors by aspiration biopsy. *Surg Gynecol Obstet* 1945; 80:517–22.
4. Ottolenghi CE. Diagnosis of orthopaedic lesions by aspiration biopsy. *J Bone Joint Surg Am* 1955; 37: 443– 64.
5. Schajowicz F, Derqui JC. Puncture biopsy in lesions of the locomotor system. *Cancer* 1968; 21: 531–48.
6. Stormby N, Akerman M. Cytodiagnosis of bone lesions by means of fine-needle aspiration. *Acta Cytol* 1973; 17: 166–72.
7. Sabari Devi, Sukalyan Dey, Partha Sarathi Chakrabarty. Role Of Fine Needle Aspiration Cytology As An Initial Diagnostic Tool In Musculoskeletal Tumours. *Indian Journal of Medical Research and Pharmaceutical Sciences*. June 2015; 2(6):1-10.
8. Merce Jorda, Luis Rey, Andrew Hanley. Fine needle aspiration cytology of bone- accuracy and pitfall of cyto diagnosis. *Cancer cyto pathology*. Vol 90, issue 1,47-54,2000
9. Wahane RN1, Lele VR, Bobhate SK. Fine needle aspiration cytology of bone tumors. *Acta Cytol*. 2007 Sep-Oct;51(5):711-20.