

Original Research Article

Role of FNAC in Diagnosis of Palpable Subcutaneous NodulesRajesh Kumar¹, Sangita Choudhary², Md. Ezaz Zafar³, Ragini Kumari⁴, Preeti Singh⁵, Abhijeet Das⁶¹Associate Professor, Department of Pathology, Katihar Medical College, Katihar, Bihar, India²Assistant Professor, ³Professor, Department of Biochemisry, Katihar Medical College, Katihar, Bihar, India^{4,5,6}Post graduate trainee, Department of Pathology, Katihar Medical College, Katihar, Bihar, India***Corresponding author**

Sangita Choudhary

Email: dr.sangitarajdmch@gmail.com

Abstract: Role of FNAC in subcutaneous nodules is for the rapid, non-invasive diagnosis of primary tumors, tumor recurrence, metastatic tumors & the distinction between a reactive process likely to resolve spontaneously or respond to conservative treatment. It has limited role in diagnosis of primary tumor of skin & subcutis to ease of surgical excision. Only a few series of FNAC of subcutaneous nodules have been reported. In our study FNAC was done in 200 cases of palpable subcutaneous nodules that had come to the dept. of pathology, KMCH, Katihar in between January 2015 - December 2016. FNAC was done by using 22-23 gauge needle, smears were stained by MGG, PAP & H&E stains and evaluated with clinical & radiological correlation. Histopathological correlations were done wherever possible. There were 130 males (65%) & 70 females(35%) from age ranging between 1-72 yrs evaluated. Aspirations done from different sites of the body, most common was neck, shoulder & abdomen. Out of 200 cases, benign neoplasm were 124(62%), cystic lesions were 36(18%), infective were 32(16%) & malignant were 08(4%). Lipoma was the commonest subcutaneous nodule followed by benign cystic lesions.

Keywords: FNAC, subcutaneous nodules, tumours

INTRODUCTION

In the era of modern diagnostic cytopathology, the practice of FNAC is clear advantages to patients, doctors & taxpayers. The technique is relatively painless, produces a speedy result, and is inexpensive [1]. The interest followed on preoperative diagnosis of neoplasm, benign or malignant, in any organ or tissues of the body and also valuable in the diagnosis of infections, cystic, inflammatory & degenerative conditions [2]. Intraoperative cytology as an alternative to frozen section examination using these days with a comparable level of accuracy [3].

The main indication of FNAC in tumor and tumor like lesions of subcutis is Investigation of primary tumours, suspected metastatic malignancy, recurrent tumours and the distinction between reactive process and neoplasia. It is a rapid, simple and convenient method for investigation of nodules, indurations and thickenings related to surgical scars or elsewhere in the skin or subcutis in patients with known malignancy [4]. Multiple sampling from different parts of large heterogeneous lesions is also possible without complications & hospitalization is not necessary. By

using rapid staining procedures, a preliminary diagnosis will be made within short time and surgery can be avoided if lesion proves to be non neoplastic, or delayed for convenience if it is benign. In the cases of metastatic malignancy it allows pre-operative staging and planning of the extent of surgery. By doing FNAC instead of surgical biopsy seeding of tumor cells to uninvolved tissue may be minimized [4, 5]. However the differentiation between few skin adnexal tumor and metastatic malignancy can sometimes be difficult. However, from a clinical point of view, the distinction between primary and metastatic tumor is the essential information sought [4].

MATERIAL AND METHODS

FNAC was done in 200 cases of palpable subcutaneous nodules that have come to Department of Pathology, Katihar Medical College, Katihar in between January 2015 to December 2016. FNAC was performed using 22- 23 Gauge needle after proper aseptic precaution by both with aspiration & without aspiration method. In some cases of skin tumor insertion of needle was done parallel/tangential for more precise specimen collection. Multiple aspirations were done in few cases.

Air dried smears were stained by MGG stain & wet fixed smears were stained by PAP & H&E stain. MGG stained smears highlight cytoplasmic & stromal details

whereas PAP & H&E stained smears give excellent nuclear details. Cytohistological correlation was done, wherever possible.

OBSERVATIONS

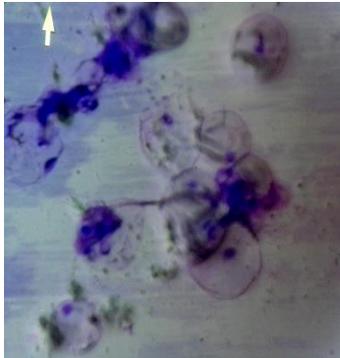
Table 1: 200 FNAC cases of subcutaneous nodules were studied with following observations

S.No.	Cytological diagnosis	Cytological typing	No. of cases	Age (years)	Sex	Salient cytological features
1.	Lipoma & its variants	Benign	105	10-72	78 M 27 F	Mature adipocytes in the background of fat droplets
2.	Epidermal inclusion cyst	Benign	28	5-64	18 M 10 F	Benign squamous cells, anucleate squames, inflammatory cells & debris
3.	Ganglion	Benign	06	10-55	04 M 02 F	A few pale histiocytes like cells in the background of myxoid material
4.	Calcinosis cutis	Benign	02	24-60	02 F	Areas of calcified masses, crystals & histiocytes
5.	Cold abscess	infective	26	10-45	12 M 14 F	Epithelioid granulomas with granular necrosis & langhan's giant cells
6.	Filarial nodules	infective	02	20-40	01 M 01 F	Filarial worm & microfilaria with eosinophils
7.	Abscess	infective	04	08-36	03 M 01 F	Intact & disintegrated neutrophils with areas of necrosis
8.	Foreign body granuloma	Benign	01	40	01 M	Granulomas with foreign body type of giant cells
9.	Neurofibroma	Benign	06	20- 40	05 M 01 F	Wavy pattern of spindle cells with fibrillar stroma & nuclear palisading
10.	Endometriosis	Benign	01	32	01 F	Biphasic tissue fragment, sheet of glandular epithelial cells & spindle cell stromal tissue
11.	Cutaneous cylindroma	Benign	01	56	01 F	Pseudopapillary fragments of cohesive basaloid epithelial cells
12.	Benign vascular tumor	Benign	04	1-45	02 M 02 F	Strands of endothelial cells in hemorrhagic background
13.	Benign Fibrous histiocytoma	Benign	06	18-40	04 M 02 F	Benign fibroblasts with histiocytes
14.	Malignant vascular tumour	Malignant	01	66	01 F	Atypical spindle & epithelioid cells with fragmented vessels
15.	Basal cell carcinoma	Malignant	03	35-60	01 M 02 F	Cohesive basal cell fragments with nuclear palisading
16.	Metastatic adenocarcinoma	Malignant	01	70	01 F	pleomorphic malignant cells in clusters & glandular pattern
17.	Squamous cell carcinoma	Malignant	02	50-72	01 M 01 F	pleomorphic malignant squamous cells in sheets & scattered singly as well
18.	Dysgerminoma, metastatic	Malignant	01	32	01 F	Round to oval cells, mostly dispersed with prominent nucleoli & lymphocytes in tigroid background

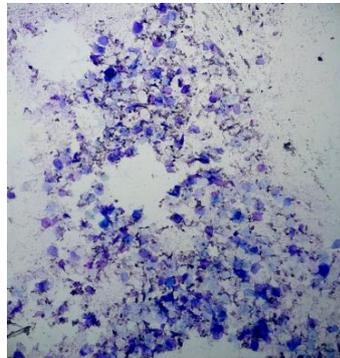
Distribution of patients, according to age, sex, cytological typing & cytomorphological diagnosis

Out of 200 cases, benign neoplasm were 124 (62%), cystic lesions 36 (18%), infective 32 (16%) &

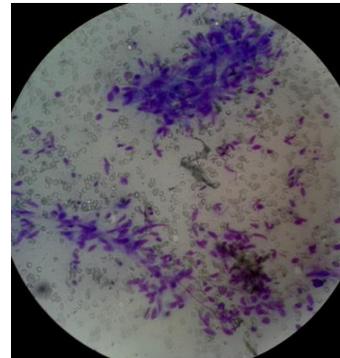
malignant 08(4%). Among the neoplasms Lipoma & its variants were commonest followed by cystic lesions.



Lipoma 40 x



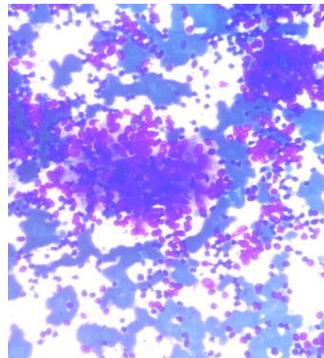
Epidermal inclusion cyst 10 x



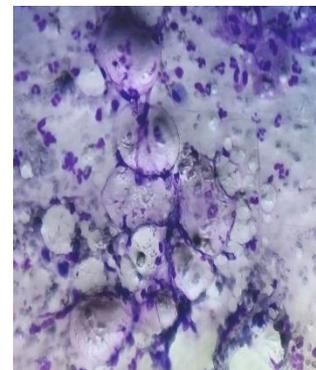
Neurofibroma 40 x



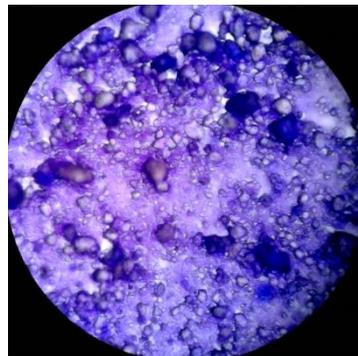
Microfilaria 40x



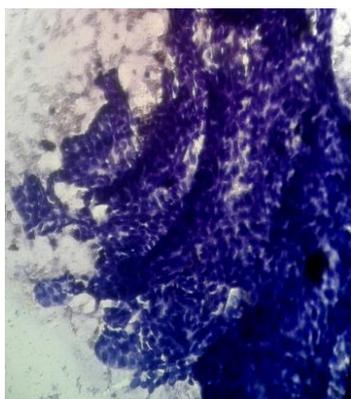
Cold abscess 40 x



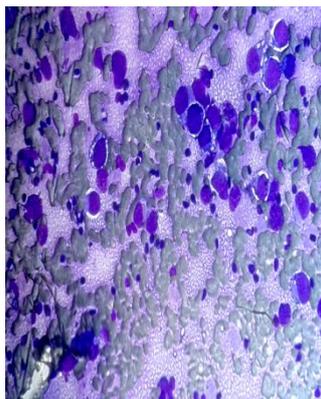
Infected Epidermal inclusion cyst 40 x



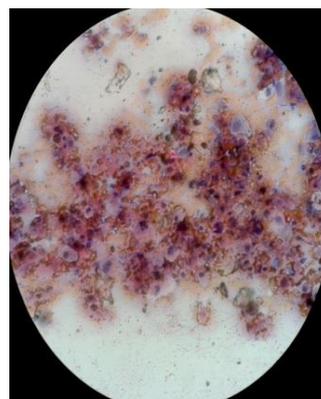
Calcinosis cutis 10 x



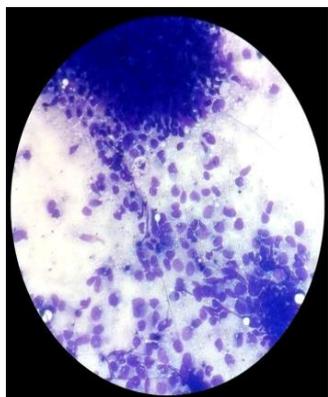
Basal cell carcinoma 40 x



Dysgerminoma,met 10 x



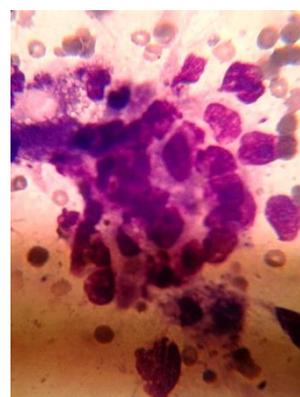
Squamous cell carcinoma 10 x



Malignant vascular tumour 10 x



Malignant vascular tumour 40 x



Adeno carcinoma,met 40 x

Figure-1

DISCUSSION

Role of FNAC and cytodiagnosis of skin & subcutaneous nodules has found limited application by some workers due to the ease of surgical excision and argued that it should be restricted for assessment of suspected metastatic malignancy and recurrent lesions [4, 6]. However, studies by Rekhi B *et al* [7], Liu K L *et al* [8], Layfield L J *et al* [6] & Domanski H *et al* [9] clearly established the role of cytology in this field with highly sensitive & specific tumor detection in their study group.

FNAC is routinely used as a screening test. It gives fairly accurate results regarding the nature of lesions, especially when supported by appropriate clinical findings and radiology [10]. Adequate FNA sampling and sufficient cellularity with preserved cytomorphological details are pre requisites for avoiding false negative results. It was observed that the patients who had benign and non-neoplastic lesions were relatively younger than malignant cases.

The overall incidence of cutaneous and subcutaneous metastasis has been reported to range

from 0.7% to 10%. Although any region of skin can be involved, metastasis generally tends to occur close to the site of the primary malignancy [11]. The present study included 200 patients, 130 males & 70 females of age groups 1-72 years. It does not have any false positive /false negative results in broadly categorizing the lesion as inflammatory, neoplastic, benign, malignant, reactive and cystic with radiological and clinical correlation. Typing particularly of benign cystic lesion has always been difficult on cytology. The vast volume of tissue called soft tissue compartment is represented by fat, fibrous tissue, blood vessels, skeletal muscles & the peripheral nervous system.¹² In present study, we have taken only superficial lesions. Diseases presenting as tumor like masses in the compartment are challenging, as these tissues can harbour their own mesenchymal tumors & they also provide a hospitable environment for secondary deposits of epithelial, melanocytic & even lymphoid parentage & secondly, non-neoplastic inflammatory masses, cysts or reactive condition at this site add to the complexity of condition which must enter in the differential diagnosis. Open surgical biopsy procedures, unless meticulously planned with care by skilled personnel, are not without adverse

or hazardous effects [4, 12]. A retrospective analysis of FNA material by Akerman *et al* from the orthopaedic Oncology Group, Lund University Hospital over the last 20 years, revealed that diagnostic aspirates were obtained from 475 out of 517 soft tissue tumors (92%). A correct diagnosis with regard to benign versus malignant lesion was made in 447 (94%) of the 475 diagnostic aspirates. The main reasons for obtaining insufficient material were the presence of large cystic or necrotic areas, highly vascular lesions or a collagenous background matrix [9]. Borasji *et al* [13] also reported similar accuracy figures in a retrospective study of 342 cases from the musculo-skeletal tumor group at the Karolinska Hospital, Stockholm. As with FNA material from other sites, it is critical to have a multidisciplinary approach when evaluating aspirated material from soft tissue. The patient age, location, size, mobility and anatomic location of the mass, the clinical presentation (rapid vs. slow growth) along with the radiographic findings were correlated with the cytologic features and high sensitivity & specificity is reported [5, 8]. Benign lesions are generally small circumscribed & cutaneous or superficial masses whereas malignant lesions are more often large, infiltrative & deep seated [6, 8].

CONCLUSION

FNAC of cutaneous & subcutaneous nodules plays an important role in rapid confirmation of the diagnosis and avoiding unnecessary surgical intervention in the majority of cases. Diagnosis of metastasis can be made easily and promptly. It is a simple and inexpensive technique with high sensitivity and specificity and has proved to be very useful in quick confirmation of the nature of the nodular skin lesion, so can provide purposeful accurate information to clinicians.

ACKNOWLEDGEMENT

We are very thankful to our college authority that provided all the necessary facilities to complete this work. We are also very thankful to those subjects who permitted us without any hesitation to complete our study.

REFERENCES

1. Frable WJ. Thin -needle aspiration biopsy. Philadelphia: Saunders, 1983.
2. Stringle SM, Rarick MU, Cosgrove MM. A review of the fine needle aspiration cytology findings in Human immunodeficiency virus infection. Dign Patholol. 1992;9:232-237.
3. Philips J. intraoperative cytological diagnosis. In: Russel P, Farnsworth A. surgical pathology of the ovaries, 2nd edn. Edingburgh: Churchill Livingstone. 1997;643-656.
4. Orell SR, Sterrett GF, Whitaker D. 4th edition. Churchill Livingstone. Fine needle aspiration cytology. 2005;409-32.
5. Ackerman M, Rydholm A. Surgery based on fine needle aspiration cytology. Acta Orthop Scand. 1994;65:256:69 – 70.
6. Layfield LJ. Fine needle aspiration of the musculoskeletal system. In: Atkinson B F, Silvermann JF, editors, 1998. Atlas of Difficult Diagnosis in Cytopathology. Philidelphia: W. B. Saunders Company. 1998;481 –506.
7. Rekhi B, Gorad BD, Kakade AC, Chinoy R. Scope of FNAC in the diagnosis of soft tissue tumors: A study from a tertiary cancer referral centre in India. Cyto Journal. 2007;31:4– 20.
8. Liu KL, Layfield J, Coogan AC, Ballo MS, Bentz JS, Dodge RK. Diagnostic accuracy of fine needle aspiration of soft tissue and bone lesions: influence of clinical history & experience. Am J Clin Pathol. 1999;111(5):632 – 640.
9. Domanski HA. Fine needle aspiration cytology of soft tissue lesions: Diagnostic challenges. Diagn Cytopathol. 2007;35:768 –773.
10. Frable WJ. cytology, past, present & future. Human pathol. 1989;20(6):504-518.
11. Looking bill DP, Spangler N Helm KM. cutaneous metastatic carcinoma: a retrospective study of 4020 patients. J Am Acad Dermatol. 1993;29:228 – 36.
12. Geisinger K, Abdul Karim FW. Fine needle aspiration biopsy of soft tissue tumor. In: Weiss S W, Goldblum J R, editors. Enzinger and Weiss's soft tissue tumors. 4th ed. Louis London: Mosby. 2001;147 – 85.
13. Brosjo O, Baucer HC, Kreicbergs A. Fine needle aspiration biopsy of soft tissue tumors. Acta Orthop Scand. 1994;65:108 – 9.