



Utility of fine needle aspiration cytology in soft tissue tumors and its correlation with histopathology

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ABSTRACT

The aim of our study is to evaluate utility and accuracy of fine needle aspiration cytology (FNAC) in diagnosis of soft tissue tumors (STTs). FNAC was performed on total of 300 cases of soft tissue tumors. Out of which 65 biopsies were studied and correlation done. Most common diagnosis was lipoma in cytology (82.66%) and histopathology (83.07%) followed by neurofibroma in cytology (4.66%) and in histopathology (6.01%). All benign tumors diagnosed by cytology were confirmed as benign on histopathology. FNAC of soft tissue tumors is quite safe, cost effective and reliable diagnostic tool in the evaluation of soft tissue tumors. It is very much helpful in preoperative diagnosis of benign and malignant soft tissue tumors.

INTRODUCTION

Diagnostic cytology is the culmination of several centuries of observations and research. [1] In 1886 needle is employed to obtain cells in case of pulmonary carcinoma. In 1927, it was proposed by Dudgen and Patrik that needling of tumors is a mean of rapid microscopic diagnosis. In 1934 Martin and Ellis used needle of thicker caliber (18 G). [2] Since than FNAC is widely practiced and travelled a rough and tortuous course to present state. [1,2,3,4]

Fine needle aspiration cytology is easy outpatient department technique for sampling both the superficial and deep-seated lesions without major preparation and trauma. The procedure is very cheap, gives fast results and multiple samples can be aspirated. [2,5,6] Availability of sophisticated methods of investigations such as computerized tomography, magnetic resonance imaging, ultrasonography and radioisotopes scanning is very minimal in developing and under developed countries. In such conditions FNAC remains the ultimate diagnostic tool for diagnosis of various neoplasms. [7]

In our body non epithelial extra skeletal tissue of the body excluding reticuloendothelial system, glia and supporting tissue of various parenchymal organs is included in soft tissue. [1,8,5] They are derived from embryonic mesoderm and some part of neuroectoderm. [9] It is represented by the voluntary muscle, fat, fibrous tissue along with blood vessels supplying these tissue. Tumors arising from peripheral nervous system presents as soft tissue masses and they pose similar problems in differential

diagnosis and therapy, so are also included in soft tissue tumors. [5,8,9,10]

Role of FNAC in initial diagnosis of soft tissue tumors is debatable. [5,6,8] FNAC is effective in diagnosing primary, recurrent and metastatic soft tissue tumors. [2,11] The relative absence of architectural pattern in cytology smears make diagnosis little difficult but it helps in 1) providing predictive diagnosis of benign or malignant nature of tumor, 2) avoiding surgery of benign tumors in elderly and patients with poor surgical risk and 3) administration of palliative treatment in high grade malignancy.

We conducted this study to understand role of FNAC in soft tissue tumors and find out its sensitivity and specificity with comparison of histopathological diagnosis.

MATERIAL AND METHODS

It is a retrospective study conducted by cytology and histopathology section of the department of Pathology, General hospital Sola Ahmedabad from the period of April 2010 to October 2014. Patients with Soft tissue tumors were included in study with exclusion of patients with inflammatory swellings. In our study 300 patients of all age groups having soft tissue tumors were evaluated by FNAC.

Methodology: FNAC was done with 22 G needle attached to 10 cc disposable syringe. Smears were fixed in methanol for 20 minutes and were then stained with Hematoxyline and Eosin stains. Air dried smears were stained with May Grunwald Giemsa stain. History, clinical findings, routine relevant laboratory investigations and radiological findings were correlated with

FNAC findings. Total 65 biopsies received from soft tissue tumor cases. They were fixed in formalin, processed routinely and slides stained with Hematoxyline and Eosin stain. Cytological diagnosis is correlated with histology diagnosis.

RESULTS

In the present study, 300 cases of soft tissue tumor were examined by FNAC. Out of which 128 patients were male and 172 were female (M:F ratio is 1:1.34), ranging in age group of 1 to 80 years. Material was insufficient in 9 cases. Out of total 300 cases one case was malignant on cytology examination.

Table 4 shows correlation between cytological and histological diagnosis. Out of 300 cases evaluated by FNA cytology, 65 cases were evaluated by histology. Out of 65, 61 cases show cytohistopathological correlation in diagnosis. Out of four discordant cases, three cases confirmed as benign but their histological typing was different. One case diagnosed as round cell tumor turned out to be neurofibroma on histopathology.

Table 1. Distribution of cases of cytology diagnosis (Total 300 cases)

Tumour type	Total No. of cases	Percentage
Lipoma	248	82.66%
Neurofibroma	14	4.66%
Neurilemoma	9	3%
Benign fibrohistiocytic tumor	9	3%
Hemangioma	3	1%
lymphangioma	1	0.33%
Giant cell tumor of tendon sheath	2	0.66%
Tumoral calcinosis	1	0.33%
Round cell tumour	3	1%
Malignant fibrous histiocytoma	1	0.33%
Unsatisfactory smears.	9	3%
Total	300	100%

Table 1 shows numbers and percentages of different cytology diagnosis in soft tissue tumor. Majority of cases were of lipoma followed by neurofibroma and schwannoma.

DISCUSSION

FNA is very useful and has established role in the diagnosis of various neoplastic and non-neoplastic lesions. [3,6] Now-a-days fine needle aspiration cytology is routinely used as screening test, either as a sole method or along with radiology, fluoroscopy, C. T. scan etc. in different superficial palpable and deep lesions. It is a useful and convenient technique for the diagnosis and follow up of soft tissue tumors. [4,6] Typing and diagnosis of low grade sarcomas is little difficult by FNAC method due to heterogeneous nature of the soft tissue tumors as well as absence of tissue architecture. [3] But it gives fairly accurate diagnosis regarding the nature of lesion. Especially when properly supported by appropriate clinical findings and other diagnostic data. [4,6]

In this study females are affected more than males. Age of patients ranges from 0 to 80 year. Majority of the patients were in the age group of 21-60 years which is correlated with study Choukimath M et al, S. Chandanwale Shirish et al and Roy S. et al. [2,5,8]

Table 2. Diagnostic Criteria for Tuberous Sclerosis Complex

Age in years	No. of cases	%
0-10	3	1
11-20	27	9
21-30	75	25
31-40	70	23.33
41-50	54	18
51-60	45	15
61-70	21	7
71-80	5	1.66
>81	0	0

Table 2 shows distribution of different cases of soft tissue tumors in different age groups. Maximum cases were seen in 21-30 age group (25%), followed by 31-40 age group (23.33%).

Table 3. Site wise distribution of soft tissue tumor (cytology) cases:

Location of tumor	Number of tumor	Percentage (%)
Head and neck	42	14
Upper limb and axilla	112	37.33
Trunk	72	24
Lower limb	54	18
Multiple	20	6.66

Table 3 shows distribution of different soft tissue lesions in different parts of body. Maximum number of cases were found to be located at upper limb and axilla (37.33%) followed by trunk (24%)

Figure 4: Cytology & histopathological correlation of soft tissue tumors (65 cases)

FNAC diagnosis	No. of cases	Histopathology diagnosis	concordant	Discordant
Lipoma	54	Lipoma-53	53	0
		Fibrolipoma-1	0	1
Neurofibroma	4	Neurofibroma-4	4	0
Benign spindle cell lesion	4	Fibroma-1	3	1
		Fibromatosis-1		
		Proliferative fasciitis-1		
		Inflammatory Changes-1		
Nodular fasciitis	1	Nodular fasciitis	1	0
Schwannoma	1	Lipoma	0	1
Round cell tumor	1	Neurofibroma	0	1
Total	65		61	04

Table 4 shows correlation between cytological and histological diagnosis. Out of 300 cases evaluated by FNA cytology, 65 cases were evaluated by histology. Out of 65, 61 cases show cytohistopathological correlation in diagnosis. Out of four discordant cases, three cases confirmed as benign but their histological typing was different. One case diagnosed as round cell tumor turned out to be neurofibroma on histopathology.

Most common diagnosis by cytology was lipoma in 248 cases (82.66%). It is also seen in other studies, e.g. Parajuli S et al (52.5%), Hirachand et al (43.18%) and Hasan et al (76.2%). 65 cases submitted for biopsy. Out of 65 cases, 54 were reported as lipoma on cytology. 53 confirmed as lipoma and one case diagnosed as fibrolipoma on histopathology. The cause for this discordance was due to lack of spindle cells in the smears we studied.

Second most common diagnosis by cytology was neurofibroma. Total 14(4.66%) neurofibroma were diagnosed by cytology. Out of which, 4 biopsies were received and confirmed on histopathology.

In this study malignant lesions diagnosed by cytology were not received for histopathological study due to referring of patient to regional cancer center for further work up.

Material was Inadequate in smears in 9 cytology cases (3%) in our study. Ackerman reported 5.5% for reporting and suggested that insufficient material was obtained due to faulty aspiration techniques in benign lesions and necrotic and cystic changes in malignant lesions.[7]

FNAC has become an important diagnostic tool in the evaluation of soft tissue tumors. But it is not widely accepted because of concern about its diagnostic accuracy in typing and grading of tumors. Difficulties arise in exact typing and diagnosis of low grade sarcoma. Other main limitation with FNAC is that the specimen does not give information about tumor tissue architecture. Different factors like localization of the lesions, technical skills and experience of pathologist, aspiration

techniques, tangential aspiration whereby the needle misses the tumor and only the inflammatory reactions are sampled, secondary changes like necrosis, fibrosis, hemorrhage and cystic change and desmoplastic tissue reactions which makes cells difficult to aspirate are the factors leading to difficulty in adequate sampling of the tumor cells. But it gives more accurate results when correlated with clinical findings and radiological investigations.

CONCLUSION

Present study has shown that FNAC is very useful procedure in pre-operative diagnosis of benignancy and malignancy of soft tissue tumor. It is also convenient technique for the diagnosis of primary, recurrent and metastatic soft tissue tumors. Although the morphological typing is not completely exact in FNAC, it permits the classification of the most frequent benign and malignant tumors in a simple and rational manner.

Above results show FNAC of soft tissue tumors is a safe, rapid, useful procedure of low financial cost, low morbidity, high compliance and acceptable diagnostic accuracy.

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