



Cytopathology of Soft Tissue Tumors with Their Varying Presentation

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ABSTRACT

Background: *Soft tissue tumors continue to challenge clinicians due to their unique character, the infrequency of their occurrence and the difficulties in predicting outcomes. Advances in imaging, as well as improvements in surgical techniques and adjunctive treatment methods, have improved care for patients with these unusual disorders.*

Aims and Objectives: *Lesion detection and characterization of soft tissue tumors by cytopathology.*

Methods: *The cytological features of soft tissue tumors (STT) are observed, diagnosed and the statistics for the cytopathology are reviewed and compared with literature references.*

Results: *Of the 2300 cases recorded in our study, 2278(99%) were diagnosed as benign STT, while 22(1%) as malignant on cytological examination. The median age of occurrence of benign STT was 3rd decade and that of malignant STT was 4th decade of life. Prevalence was highest in the age group of 20-49 years with male predomoinance.*

Conclusion: *Fine needle aspiration cytology (FNAC) is a valuable tool in the diagnosis of STT combined with competent imaging and immunocytochemistry. FNAC is rapid and non-invasive technique, which gives diagnostic clues and helps the clinicians in better management of these patients.*

Keywords: *Soft Tissue Tumors, Cytopathology, Fine Needle Aspiration Cytology.*

INTRODUCTION

Non epithelial extra skeletal tissue of the body exclusive of the reticuloendothelial system, glia and supporting tissue of various parenchymal organs are the soft tissue elements and are heterogeneous⁽⁴⁾. Soft tissue tumors represent a

major group of lesions that are often subtle in presentation and have wide variation in behavior^(1,2,3). These are classified on a histogenetic basis. FNA used for diagnosing has the advantage that it is relatively a traumatic and can be used to sample deep-seated tumors under guidance with

CT scan. FNA minimizes the tumor spillage, and very helpful in diagnosing intra abdominal and retroperitoneal tumors.

Many of the STT have a relationship to normal soft tissue structures so that the lesions may arise in relation to the fascia, elastic tissue, fat, smooth muscle, skeletal muscles, fibrous capsule, blood vessels and nerves. The symptomatology of these tumors may be related in part to the effect they have on the function of the normal tissue adjacent to them.

Masses arising in the subcutaneous and deeper tissues are evaluated by radiologic studies and require biopsy for definite diagnosis and treatment. Clinical evaluation and management of soft tissue masses must emphasize on a team approach incorporating the combined skills of pathologists, radiologists and surgeons with the ultimate goal of improving patient outcome. FNAC, plays a vital role as a preliminary diagnostic tool in distinguishing benign from malignant STT. Our purpose is to provide a frame work for the systematic approach to FNA evaluation of STT.

AIMS AND OBJECTIVES

1. To study the cytomorphology of soft tissue tumors.
2. To study the distribution of soft tissue tumors.

METHODS

The study includes 2300 cases and was carried out in the Department of Pathology, Mysore Medical college and Research Institute for a period of five years from Jan-2011 to Dec-2015. Cases with soft tissue swelling attending Krishna Rajendra and Chaluvamba Hospital were selected. Aspiration was carried out using a 22gauge disposable needle and 10cc disposable syringe for suction. The wet fixed smears were stained with hematoxylin – eosin (H&E) and pap stain and a detailed cytological examination was done. The FNAC report was correlated with histopathology report and

immunohistochemical stains like vimentin, S-100 protein, HMB-45, calretin and CD-34 were done in few cases to confirm the diagnosis.

STATISTICAL ANALYSIS

Data analyzed, tabulated and statistical techniques like frequency distribution and percentage were calculated and represented with tables charts using R software.

RESULTS

Of the 2300 cases recorded in our study, 2278 (99%) were diagnosed as benign STT, while 22 (1%) as malignant on cytological examination. The median age of occurrence of benign STT was 3rd decade and that of malignant STT was 4th decade of life^(5,6). Prevalence was highest in the age group of 20-49 years with male predominance^(5,7).

Table 1 shows the Distribution of Soft Tissue Tumors (2300 cases)

Lipoma was the commonest tumor in our study. Fibrous histiocytomas were the next common tumors followed by hemangiomas and Schwannomas. Benign spindle cell tumors in this series comprised of tumors which were more neurogenic in origin and few were benign fibrous tumors. Neurogenic tumors were mainly schwannomas and neurofibromas,

This series showed highest incidence of malignant fibrous histiocytoma and liposarcoma which could be diagnosed on cytological features alone. 2 cases of rhabdomyosarcoma and one case of leiomyosarcoma were found in our study.

Two cases in our study posed problems in diagnosis and required extensive workup. These cases are presented here briefly to highlight the need for multidisciplinary approach in diagnosing soft tissue tumors in some cases.

Case 1: A 35 year old male presented with history of dyspnoea. On examination clinician noticed multiple swellings over the body and referred to cytopathology section. There were well defined nodules over the left upper extremity and face. FNAC from all the nodules showed

similar cytomorphology (fig 1), Smears were cellular and showed spindle shaped cells with elongated nuclei, vesicular chromatin and moderate cytoplasm. On cytology only a diagnosis of spindle cell lesion could be made. On radiology a lesion in lung was detected with metastasis to pleura. Lung biopsy showed features of malignant mesothelioma, Both lung biopsy and nodule excision biopsy showed calretin positivity. The final diagnosis was malignant mesothelioma of biphasic type.

Case 2: 55 years female presented with recurrent exophytic grey white ulcerated mass over the right medial malleolus (fig 2) previously diagnosed as Neurilemmoma. There were multiple nodules of varying sizes, soft in consistency along the course of right peroneal nerve and inguinal region measuring 3x2cms. FNA from the inguinal swellings thought to be lymph nodes were highly cellular and composed of plump cells with spindle nuclei and abundant cytoplasm amidst a few pleomorphic cells(fig 3) and fibrillar stromal fragments seen against a myxoid background. It was diagnosed as Ancient Neurilemmoma on cytology and as benign fibrous histiocytoma on histopathology. However, immunohistochemistry showed positivity for S-100 protein(fig 4) and HMB-45 (fig 5). The final diagnosis of this case was Clear cell sarcoma.

Fig 1- FNAC of Spindle cell tumor

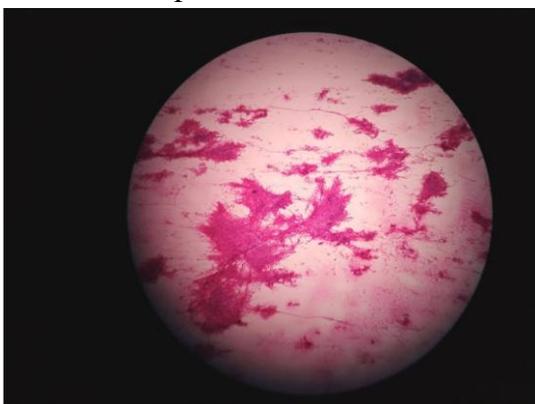


Fig 2- Ulceroproliferative growth over the right medial malleolus with enlarged inguinal lymph node



Fig 3- FNAC of Ancient Schwannoma

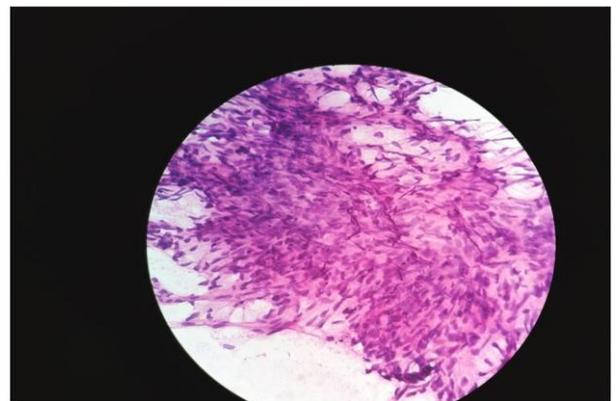


Fig 4- S100(200): Immunoreactivity

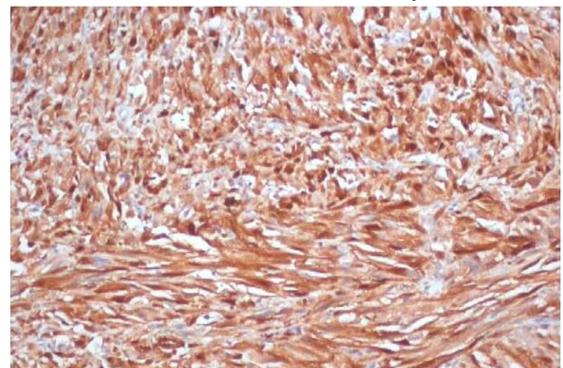


Fig 5- HMB45(X200): Immuno reactivity

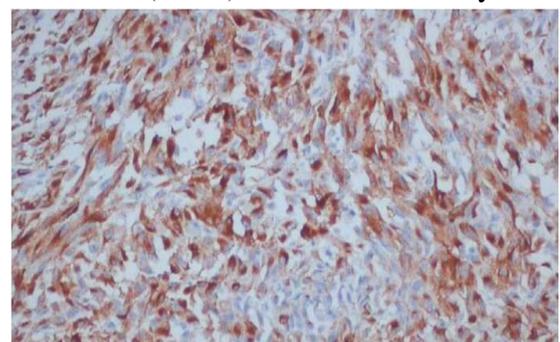


Table 1- Shows the Distribution of Soft Tissue Tumors (2300 cases)

Benign Lesions [2278 cases]	Number of cases	Percentage(%)
Lipoma and its variants	1380	60%
Fibrous histiocytoma	460	20%
Benign spindle cell tumors(non specific)	253	11%
Neurogenic	23	01%
PVNS/GCTTS(giant cell tumor of tendon sheath)	06	0.26%
Vascular lesions	156	07%
Malignant Lesions [22 cases]		
Malignant fibrous histiocytoma	07	32%
Dermatofibrosarcoma protuberance	06	27%
Liposarcoma	06	27%
Rhabdomyosarcoma	02	09%
Leiomyosarcoma	01	04%

DISCUSSION

FNAC has become an established tool as a diagnostic tool in many clinical conditions. It is one of the important frontiers in evaluation of soft tissue tumors^(7,11). It was found that there were false negative cases - 3 cases of lipoma that were later diagnosed as well differentiated liposarcoma on histopathology, cases of fibromatoses were later diagnosed as fibrosarcoma on histopathology and cytological diagnosis of benign spindle cell tumor were turned out to be low grade fibromyxoid sarcoma on histopathology which is similar to the study conducted by Kulkarni et al. In the present study ancient schwannoma was diagnosed as Clear cell sarcoma after immunohistochemistry. Our study compares well with Priyanka et al and others in the distribution of both benign and malignant tumors lipoma being the commonest benign tumor and malignant fibrous histiocytoma being commonest malignant tumor⁽⁵⁾.

FNAC of STT sometimes results in inadequate sampling of the tumor due to blood contamination. The individual cells are dispersed leading to partial loss of recognizable diagnostic pattern this results in less specificity for diagnoses, which is similar to the observation made by Nagira K et al. It is difficult, in some cases, to distinguish benign cellular lesions from

borderline tumors and low grade sarcomas. Cytomorphologic features of fibrosarcomas are difficult to distinguish from fibromatoses^(12,13). Also, in densely collagenised or sclerotic or vascular or cystic lesions, FNAC yields sparse cellularity making diagnosis difficult. In such case diagnosis can be made only on histopathology.

In our study we would like to emphasize that diagnosis of STT by FNAC requires cooperation and interaction between the pathologist, surgeon and radiologist. Diagnosis of STT could be strengthened by histological correlation with the help of immunohistochemistry^(14,15).

CONCLUSION

The bulk of reported data and our own practices support the ability of fine needle aspiration cytology to accurately diagnose soft tissue tumors. We can conclude that FNAC is a useful, safe and cost-effective procedure for the evaluation of soft tissue tumors.

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