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## Original Research

### Initial diagnosis of superficial soft tissue lesions with Fine Needle Aspiration Cytology

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#### ABSTRACT

**Background:** Soft tissues are the supportive tissue of various organs as well as the non epithelial, extraskelatal structures. They include adipose tissue, fibrous connective tissue, skeletal muscle, blood vessels, and the peripheral nervous system. **Aim of the study:** To analyze initial diagnosis of superficial soft tissue lesions with Fine Needle Aspiration Cytology. **Materials and methods:** The study was conducted in the Department of General Pathology of the Medical institute. The study was conducted on subjects who were referred to the Department of General Pathology with superficial soft tissue masses for the study period. A total of 114 patients reported to the department for the FNAC of soft tissue lesions. We excluded the subjects with breast lesions, lymph nodes lesions, and salivary glands lesions. A total of 100 patients were selected for the study. We used Franzen's type aspiration handle, 20cc syringes for aspiration of the sample from the soft tissue lesion. **Results:** A total of 100 cases were studied. The FNAC samples were obtained and cytological and histological studies were done. The results showed that number of benign lesions was 14 and number of malignant cases was 14. Of the benign lesions, lipoma was the most common benign lesion, followed by hemangioma and neurofibroma. **Conclusion:** FNAC is a highly reliable procedure for initial diagnosis of superficial soft tissue lesions. In our study, 86% cases were benign and 14% cases were malignant.

**Keywords:** Benign tumor, FNAC, soft tissue lesions

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#### INTRODUCTION

Soft tissues are the supportive tissue of various organs as well as the non epithelial, extraskelatal structures. They include adipose tissue, fibrous connective tissue, skeletal muscle, blood vessels, and the peripheral nervous system.<sup>1</sup> Soft tissues are almost entirely derived from the mesoderm except for the peripheral nerves. Soft tissue tumors, being a large heterogeneous group of neoplasms, are classified according to histogenesis, as detailed below. Most have benign and malignant counterparts; some are of borderline malignant potential with aggressive local invasion.<sup>2</sup> The incidence of benign soft tissue tumors is about ten times that of malignant ones. Benign deep masses in adults are usually due to intramuscular lipoma. Extremity masses larger than 5-7 cm and deeper than subcutaneous tissue, favour the diagnosis of a malignant soft tissue tumor.<sup>3</sup> Benign tumors are usually superficial and well defined or encapsulated masses showing slow growth. Fine needle aspiration cytology (FNAC) is considered as an inexpensive, easy to perform, safe procedure with fair sensitivity and specificity in the diagnosis

of primary, recurrent, and metastatic STT.<sup>4</sup> FNAC offers many advantages in different clinical scenarios. It can provide a predictive diagnosis of a benign or malignant neoplasm. If the diagnosis of benign neoplasm is made, surgery can be avoided in the elderly and in patients who are of poor surgical fitness. In high-grade malignancy or in recurrent cancers, it allows the administration of palliative treatment.<sup>5, 6</sup> Hence, the present study was conducted to analyze initial diagnosis of superficial soft tissue lesions with Fine Needle Aspiration Cytology.

#### MATERIALS AND METHODS

The study was conducted in the Department of Pathology, G.S. Medical College, Pilakhwa, Uttar Pradesh, India. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. The study was conducted on subjects who were referred to the Department of General Pathology with superficial soft tissue masses for the study period. A total of 114 patients reported to the department for the

FNAC of soft tissue lesions. We excluded the subjects with breast lesions, lymph nodes lesions, and salivary glands lesions. A total of 100 patients were selected for the study. We used Franzen’s type aspiration handle, 20cc syringes for aspiration of the sample from the soft tissue lesion. For the staining of slides, we used MGG and PAP stains. The fixation of the biopsies was done with 10% formalin and processed as per standard histopathological technical guidelines. The diagnosis was arrived after studying the fine needle aspiration smears. Subsequently confirmation of the diagnosis was done by histopathological examination of all the malignant lesions. The results of the histological examination were tabulated and subjected to further evaluation. The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

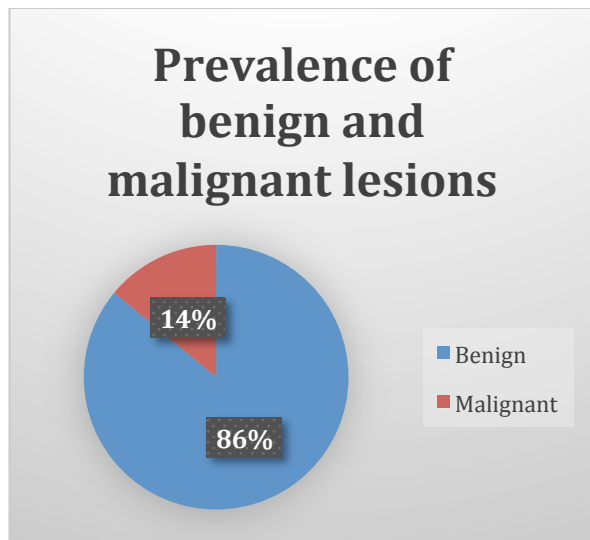
**RESULTS**

A total of 100 cases were studied. The FNAC samples were obtained and cytological and histological studies were done. The results showed that number of benign lesions was 86 and number of malignant cases was 14. [Fig 1 and Table 1]. Of the benign lesions, lipoma was the most common benign lesion, followed by hemangioma and neurofibroma. [Fig 2]

**Table 1: Nature of superficial skin tumors**

Nature of lesion	Number of cases
<b>Benign</b>	86
<b>Malignant</b>	14
<b>Total</b>	100

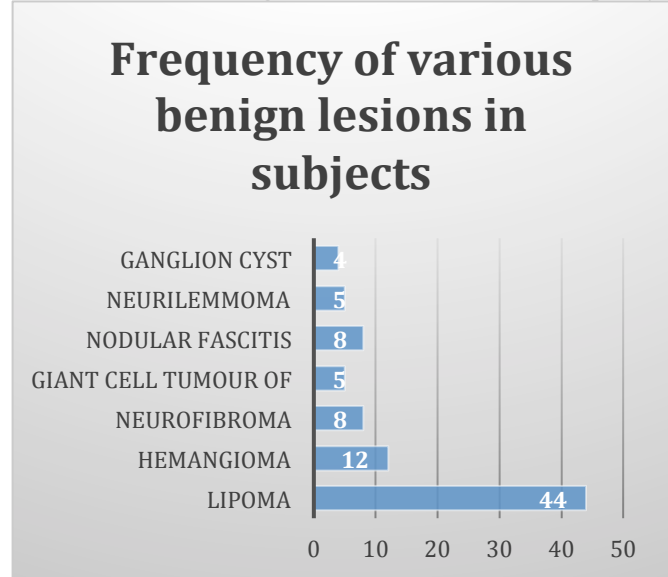
**Fig 1: Nature of superficial skin tumors**



**Table 2: Various benign lesions and their frequency**

Benign lesions	No. of cases	p-value
<b>Total cases</b>	86	0.12
<b>Lipoma</b>	44	
<b>Hemangioma</b>	12	
<b>Neurofibroma</b>	8	
<b>Giant Cell Tumour of Tendon Sheath</b>	5	
<b>Nodular fasciitis</b>	8	
<b>Neurilemmoma</b>	5	
<b>Ganglion cyst</b>	4	

**Fig 2 Various benign lesions and their frequency**



**DISCUSSION**

In the present study we assessed the efficacy of fine needle aspiration cytology for the initial diagnosis of superficial soft tissue lesions. We observed that 86% cases reported were benign in nature and 14% cases were malignant in nature. Of the benign lesions, lipoma was most prevalent. But the results were statistically non-significant. The results were compared with previous studies. Bhowmik A et al analyzed the concordance rate between cytological and histopathological diagnosis of skin and superficial soft tissue lesions. They retrospectively studied 510 consecutive fine needle aspiration cytology findings of cases from North Bengal Medical College and Hospital and correlated their diagnoses based upon cytological and histopathological grounds. Out of the 510 cases studied, 253 were non neoplastic lesions and 257 were neoplastic. A high degree of concordance rate was observed (100% for malignant and 96.15% for benign lesions) when these two diagnostic modalities were compared. Histopathological

correlation was possible in all malignant, 52/189 (27.51%) of benign and 27/253 (10.67%) of non-neoplastic lesions. Sensitivity and specificity of diagnoses were 95.31% and 97.6%, respectively. They concluded that that fine needle aspiration cytology is a rapid, reliable and fairly accurate tool for initial triage and treatment of skin and superficial soft tissue lesions. Arul P et al explored the utility and accuracy of FNAC in STT by correlating their histopathological diagnoses. A total of 220 FNAC of STT was retrieved and evaluated retrospectively between January 2012 and June 2015 and correlated with their subsequent histopathological diagnoses. On FNAC, 175 (79.6%) were benign, 26 (11.8%) were malignant and 19 (8.6%) were inconclusive. On the correlation of subsequent histopathology, 173 cases were confirmed as benign (true negative) and 22 cases were confirmed as malignant (true positive). There were four false positive and two false negative results. The sensitivity, specificity, accuracy, positive predictive value, and negative predictive values of FNAC for diagnosing malignant STT were 91.7%, 97.7%, 97%, 84.6%, and 98.9%, respectively. The study concluded that FNAC can be used as a reliable diagnostic tool for preoperative triaging of benign and malignant STT with fair sensitivity, specificity, and accuracy, even though a specific diagnosis may not be possible in all cases.<sup>7, 8</sup> Rekhi B et al evaluated the scope of FNAC in diagnosing 127 cases of soft tissue tumors. Conventional Pap and MGG staining was available in all the cases. Immunocytochemistry (ICC) was performed in 15 cases. Histopathological details were available in 115 cases. 50% cases were referred for a primary diagnosis, while 26.8% & 22.8% cases were evaluated for recurrent and metastatic lesions, respectively. Extremities were the commonest sites. On FNAC, 101 cases (79.5%) were labeled as malignant, whereas 10 cases (7.9%) were labeled as benign. The remaining 16 cases (11%) were not categorized and were labeled as 'unsure/not specified'. Histopathological confirmation in 115 cases, gave a diagnostic accuracy of 98%, with a positive predictive value of 98% in malignant cases and a negative predictive value of 100% in benign cases. Two cases were false positive. Among the various cytological categories, 60 cases (47.2%) were of spindle cell type, followed by 32 (25.2%) of round cell type and 14 cases (11%) of lipomatous type. Other 12 cases (9.4%) were of pleomorphic type; 7 (5.5%) cases of epithelioid type and remaining 2 cases were of myxoid type. All the round cell, pleomorphic and myxoid type of tumors were sarcomas, whereas 73.3% cases of spindle cell type were labeled as 'malignant'. Exact cytological sub typing was offered in 58 cases, with rhabdomyosarcoma (RMS) as the most frequently sub typed tumor. The two false positive malignant cases were of fibromatosis and a pigmented schwannoma, on biopsy. Out of 28 metastatic lesions, lymph nodes were the commonest site for metastasis, with epithelioid tumors that formed highest percentage of metastatic cases. They concluded that FNAC is fairly specific and sensitive in STT diagnoses for primary, recurrent and metastatic lesions. Kitagawa Y et al evaluated the usefulness of fine needle aspiration cytology for the preoperative diagnosis of soft tissue tumours of the hand. Fine needle aspiration cytology was performed on 93 soft tissue tumours of the hand which were classified as malignant, benign or unclassified based on cytological findings. The cytological diagnosis was then compared with the postoperative histopathological diagnosis. The cytological differentiation between benign and malignant tumours showed neither false-positive nor false-negative results. Of the 47 lesions with sufficient material for cytology and that were postoperatively diagnosed histologically, 35 (including one recurrent lesion) were correctly diagnosed by fine needle

aspiration cytology. No complications were encountered. Fine needle aspiration cytology has a high degree of diagnostic accuracy and safety for soft tissue tumours of the hand.<sup>9, 10</sup>

## CONCLUSION

Within the limitations of the study, we conclude that FNAC is a highly reliable procedure for initial diagnosis of superficial soft tissue lesions. In our study, 86% cases were benign and 14% cases were malignant.

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