

A Cytological and Histological Correlational Study of Various Soft Tissue Tumors in Jharkhand Population

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Abstract : A prospective study of soft tissue tumors on aspiration cytology with histopathologic correlation was undertaken during the period of one year. Out of total 502 cases, 435 (86.65%) were benign aspirates, 65 (12.94%) were malignant aspirates and 2 (0.39%) were intermediate type. Overall diagnostic accuracy of FNAC was 88.10 % for diagnosis of nature of the tumor on cytology. Most common malignant neoplasm in our study was extraskeletal Ewing sarcoma followed by rhabdomyosarcoma and dermatofibrosarcoma protuberans. There was three false-positive diagnosis, giving a false-positive rate of 6.12% and seven false-negative diagnosis giving a false-negative rate of 20.0%. Positive predictive value for cytological diagnosis was 90.32% and negative predictive value was 86.79%.

Keywords: Soft tissue tumor, Correlational study, Cytology, Histology, Extra-skeletal Ewing Sarcoma, DFSP, MPNST, MFH, RMS, Fibrosarcoma, GCT of Tendon Sheath, Sensitivity, Specificity, Positive predictive value, Negative predictive value, Diagnostic accuracy of FNAC.

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I. Introduction

Soft-tissue neoplasms are diverse group of mesenchymal tumors. The histopathological diagnosis of soft-tissue tumors is challenging due to overlapping pathological features. Molecular diagnostic tools have shown great advantage as an aid in the differentiation between different soft-tissue tumor entities. Our population exhibits a very diverse behavior in terms of tumor biology, disease manifestation and outcome and we wish to find out the incidence of various soft tissue tumors and also find out the relative frequency of benign and malignant tumors. Adipocytic tumor are the most common benign tumor followed by smooth muscle tumor and vascular tumor. Where as the malignancy is concerned, Ewing sarcoma of extra-skeletal origin were the most common malignant tumor followed by Rhabdomyosarcoma. The sensitivity and specificity of FNAC was 80.0% and 93.87% respectively.

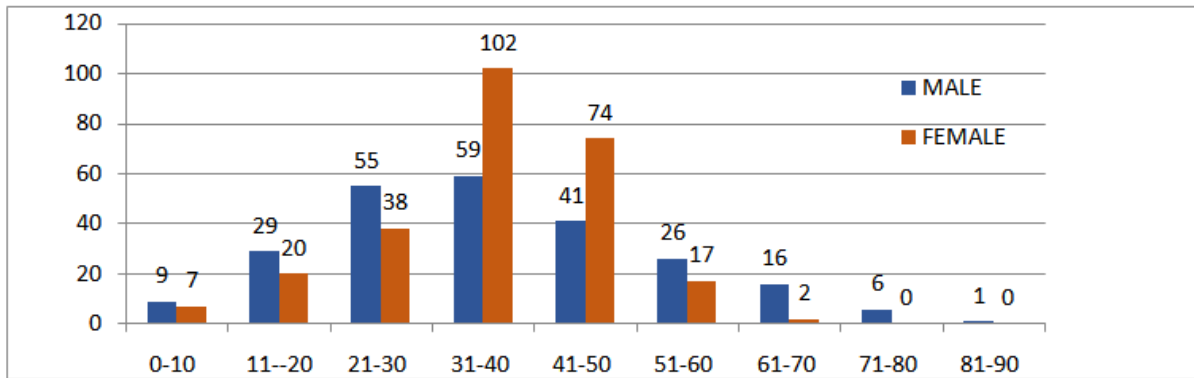
II. Aims And Objectives

1. To study the histo- pathological patterns of soft tissue tumors.
2. To find out different variations regarding age, sex and distribution in body.
3. To identify the type of the tumor and diagnostic pitfalls by fine needle aspiration cytology and correlate with histopathology.

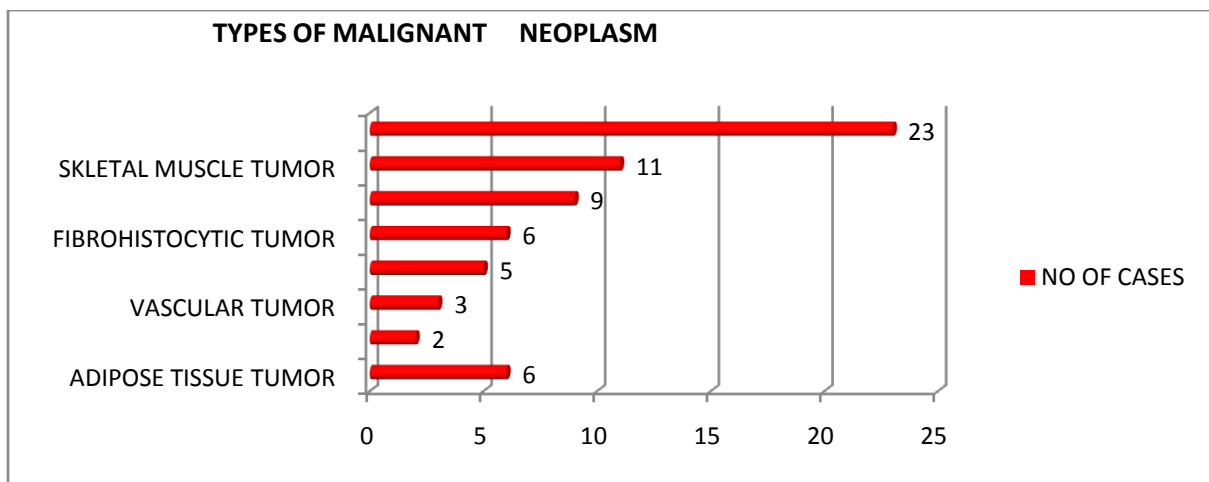
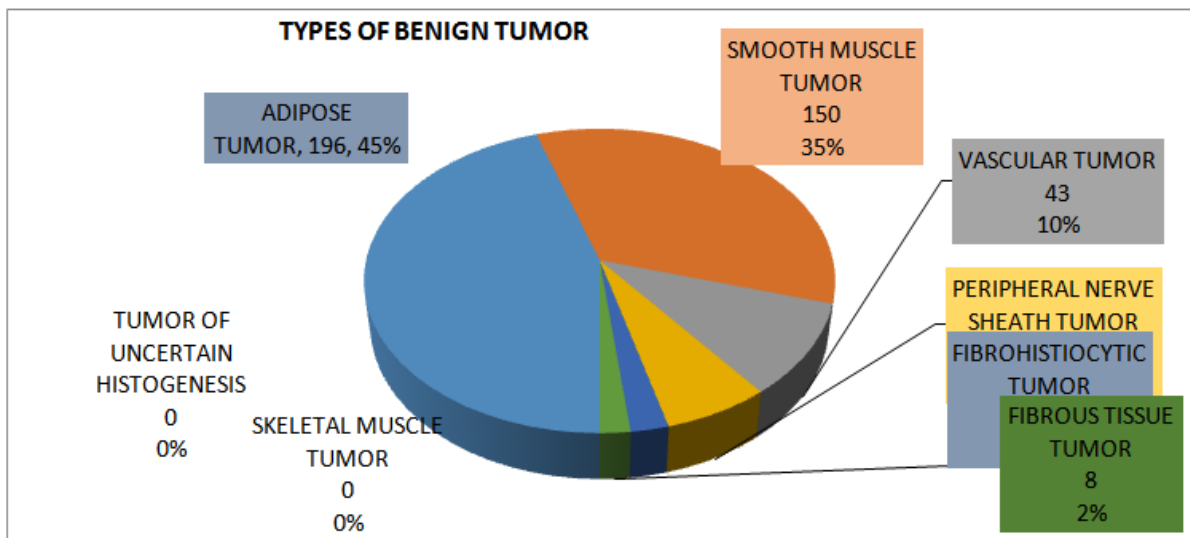
III. Material And Methods

Total 502 cases of soft tissue tumor were studied. In the present study 294 cases were diagnosed by cytology, and 292 cases were confirmed by histopathology. 84 cases that were confirmed both by the cytological as well as histological confirmation. Immunohistochemistry was done for the 45 cases

IV. Result And Observation



This Bar chart shows the number of male and female in different age group presenting with soft tissue tumor.



In the above bar diagram tumor of uncertain histogenesis represents three group of malignant tumor. They are Ewing sarcoma(16),chondrosarcoma(4),and synovial sarcoma(3). For the skeletal muscle tumor it represents three varieties of rhabdomyosarcoma [embryonal rhabdomyosarcoma(6), alveolar rhabdomyosarcoma(4),pleomorphic rhabdomyosarcoma(1)]. DFSP (7)andFibrosarcoma(2) encompass the fibrous tissue tumor. MFH/pleomorphic sarcoma(6) are the only fibrohistiocytic tumor. MPNST(4) and malignant schwannoma(1) are incorporated in the peripheral nerve sheath tumor group. Angiosarcoma(3), leiomyosarcoma(2), and liposarcoma(6) are derived from the vascular, smooth muscle, and adipose tissue respectively.

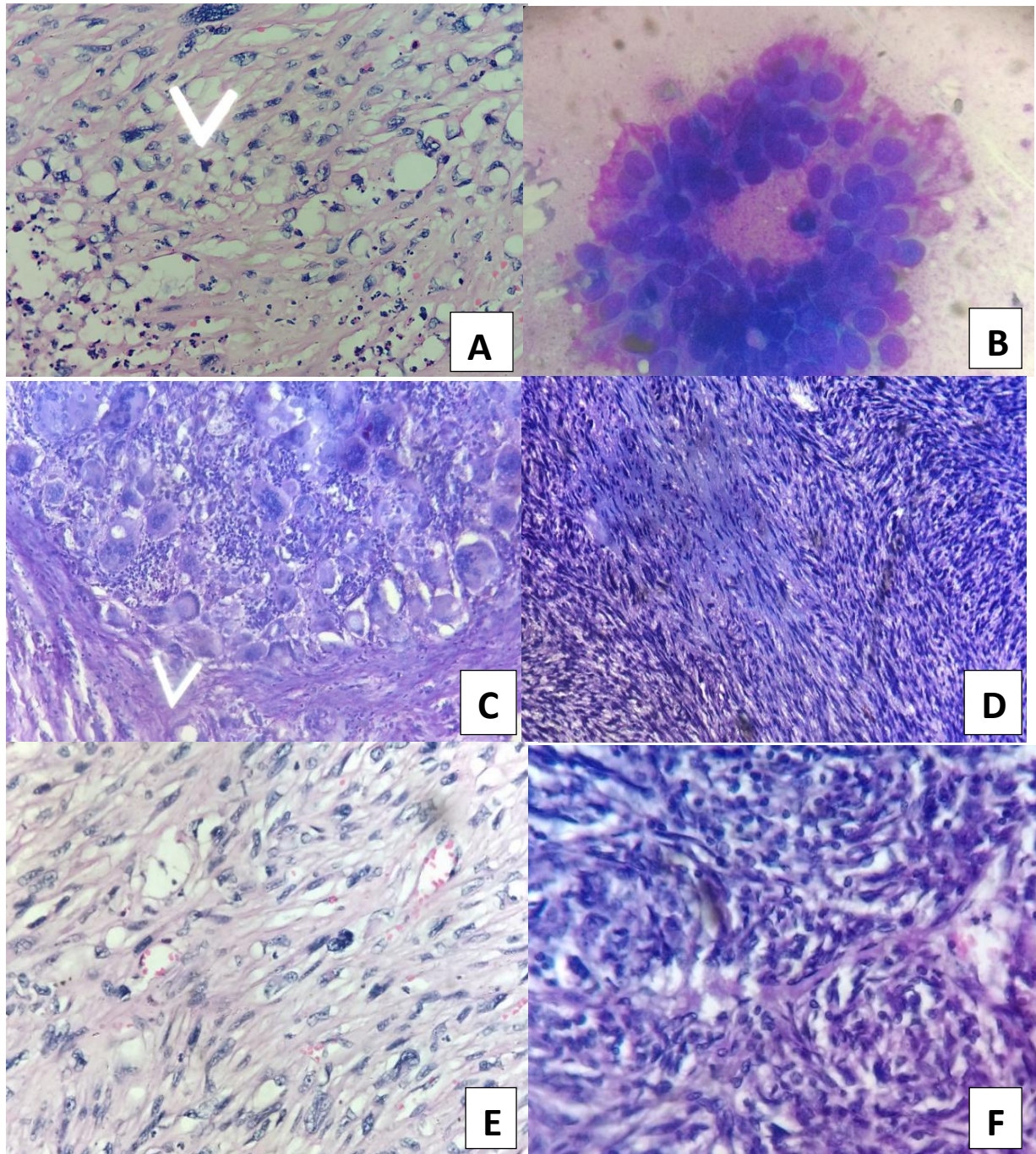


Fig- A: LIPOSARCOMA pointing toward lipoblast; **B:** EWING SARCOMA round cell tumor arranged in a rosette; **C:** GCT of the tendon sheath; **D:** FIBROSARCOMA showing HERRING BONE pattern; **E:** Synovial sarcoma; **F:** DFSP showing STORIFORM pattern.

V. Statistical Data Analysis

CYTOLOGICAL DIAGNOSIS	HISTOLOGICAL DIAGNOSIS		
	POSITIVE	NEGATIVE	
POSITIVE	28(TP)	3(FP)	31
NEGATIVE	7(FN)	46(TN)	53
	35	49	

VI. Discussion

STUDIES	SENSITIVITY	SPECIFICITY	NUMBER OF CASES
Layfield et al ¹	95	95	N.A
Bommer et al ²	96	99	450
Wakely et al ³	100	97	82
Garcia-Solano et al ⁴	91	100	107
Hirachand et al ⁵	25	100	50
Kitagawa et al ⁶	100	100	93
Amin et al ⁷	81	100	N.A
Rekhi et al ⁸	100	83	127
Present study	80	93.87	84

Table:1-Our data show a overall high sensitivity of 80% and specificity of 93.87% for the FNA diagnosis of soft tissue in the largest series of soft tissue FNAs reported in the literature.

STUDIES	NUMBER OF CASES	DIAGNOSTIC ACCURACY
Akerman et al ⁹	178	80%
Kissin M.W. et al ¹⁰	54	80%
Wakely P.E. et al ³	22	96%
Dupuy D.E. et al ¹¹	48	80%
Maitra A et al ¹²	72	68%
Yang Y. J et al ¹³	50	88%
Present Study	84	88.10%

Table:2- The present study shows an accuracy of 88.10% for diagnosis of benign and malignant tumors which is in conjunction with other authors.

STUDIES	NUMBER OF CASES	FALSE POSITIVE RATE	FALSE NEGATIVE RATE
Akerman and Wilen ¹⁴	517	04	07
Layfield L.J et al ¹	136	02	02
Kissin et al ¹⁰	54	--	18.5
Kilpatrick S.E. et al ¹⁵	--	04	04
Kilpatrick S.E et al ¹⁶	67	00	03
Maitra A. et al ¹²	72	13	11
Present study	84	3.57	8.33

Table:3- In our study, the high false-negative rate is due to high propensity in misdiagnosing spindle cell malignancies as benign tumors; one case each of MPNST, DFSP and Synovial sarcoma . One case of nodular fasciitis and two cases of Benign fibrous histiocytoma(BFH) tumors were false positively diagnosed (overdiagnose) as malignant spindle cell tumor.

VII. Conclusion

Out of total 502 cases, 435(86.65%) were benign aspirates, 65(12.94%) were malignant aspirates and 2(0.39%) were intermediate type. The maximum number of cases were found in the fourth decade of life. Male to Female ratio was 1:1.07. Most commonly affected site was trunk and viscera followed by extremities. (upper limb>lower limb). Most common tumors were that of adipose tissue origin 196(39.04%) cases. Overall diagnostic accuracy of FNAC was 88.10 % for diagnosis of nature of the tumor on cytology. Most common malignant neoplasm in our study was extraskelatal Ewing sarcoma followed by rhabdomyosarcoma and dermatofibrosarcoma protuberans. Sensitivity and specificity of diagnosis for cytology was 80.00% and 93.88 % respectively. There was three false-positive diagnosis, giving a false-positive rate of 6.12% and seven false-negative diagnosis giving a false-negative rate of 20.0%. Positive predictive value for cytological diagnosis was 90.32% and negative predictive value was 86.79%.

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