

Fine Needle Aspiration Cytology Study of Soft Tissue Tumours: A Study of 140 Cases

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ABSTRACT

Background: The diagnosis of soft tissue tumours has always been difficult and controversial. The use of fine needle aspiration cytology (FNAC) instead of incisional biopsy for the diagnosis of soft tissue tumours was first reported in 1919 and since then has become a very popular cytodagnostic procedure. Our aim is to study type of soft tissue tumors, age, sex and site distribution, incidence of benign and malignant lesions, to know role of FNAC and its efficacy in diagnosis of soft tissue tumors & compare our results with previous published studies.

Methods: Total 140 cases of soft tissue tumors were studied prospectively from september 2013 to november 2015, out of them 31 cases were followed up for cytology-histopathology comparison.

Results: Most common site of soft tissue tumors was upper extremities, 91.5% of all the lesions were benign & most common tumor was lipoma.

Conclusion: FNAC is a very useful tool for diagnosis of soft tissue tumors, in our study we found that FNAC was 100% accurate in diagnosing malignant tumors, 96% accurate in diagnosing benign soft tissue tumors & 90.3% efficient in identifying whether a tumor is benign or malignant.

Keywords: FNAC, Soft Tissue tumors, Cytology-Histopathology Comparison.

Introduction

Soft tissue tumours are defined as mesenchymal proliferations that occur in the extraskeletal, nonepithelial tissues of the body, excluding the viscera, coverings of the brain, and lymphoreticular system.^[1] The use of fine needle aspiration instead of incisional biopsy for the diagnosis of soft tissue tumours was first reported in 1919 and since then has become a very popular cytodagnostic procedure.^[2]

This study was done to know the frequency of age, sex and site distribution of soft tissue tumors, to find out relative incidence of benign and malignant tumors & to do cytology – histopathology comparison of soft tissue tumors to evaluate the efficacy of FNAC.

Material and Methods

The present study was undertaken to study the efficacy of fine needle aspiration cytology in diagnosis of soft tissue tumors as well as histopathological comparison of tumors in the department of Pathology, Govt. Medical College and Surat.

Total 140 cases were studied, all of them are of prospective study from September 2013 to November 2015. A clear explanation of procedure was given to patient to get his/her consent and cooperation. Fine needle aspiration was

performed with 22 gauge needle. Slides were stained by Haematoxylin & Eosin, May Grunwald Giemsa and Papanicolaou stain. Special stain was also done in required cases. Out of 140 cases, 31 cases were followed up for histopathology and for cyto-histo comparison.

Results

We compared the cytological diagnosis with the final diagnosis as assessed by histological examination. There were 81 males and 59 females and their age ranged from less than 1 year to 78 years. In present study soft tissue tumors were more common in male (57.9%) than female (42.1%) and male female ratio was 1.4:1.

In present study total 140 cases were studied. Maximum number of cases were in age range of 21 to 30 (26.5%) (Table 1). Second most common age group was 31-40 years and minimum number of cases were in range of age of less than 1 year (0.7%). The age range of patients was less than 1 year to 78 years. Crowding of soft tissue tumor cases were in third to fifth decades of life which were around 65.8 % of cases.

In present study most common site of soft tissue tumors was upper extremity (35%) followed by head and neck area (23.60%) (Table 2). 3rd most common site was lower extremity. Overall soft tissue tumors are very common in

extremities accounting for 45.7% cases. Least common sites were chest and abdomen.

In present study benign soft tissue tumors were 91.5% , malignant were 7.1% and 1.4% were inconclusive.

In present study out of 140 cases, 128 cases were benign. Most common benign tumor was lipoma (52.3%)(Table 3). Second most common was ganglion (10.9%). In 14.8% cases broad diagnosis were given as Benign spindle cell tumor. Least Common tumor was lipofibroma and only one case was found.

In present study total 10 cases of malignant soft tissue tumors were found, out of which most common was pleomorphic sarcoma (40%)(Table 4). In present study most common type of tumor was adipocytic (48.6%) tumors. 3rd most common type of tumor was myxoid tumor (10%). On cytology in 17.1% cases specific diagnosis was not given.

In present study out of 140 cases, we have done follow up in 31 cases about histopathology result to know the efficacy of FNAC in stamping a tumor as benign or malignant. Out of 31 cases 25 cases were diagnosed as benign tumors, 4 cases were diagnosed as malignant & 2 cases were inconclusive on FNAC probably due to inadequate material or necrosis. Out of 25 benign cases 1 case turned out to be malignant in histopathology, so according to our study specificity of FNAC in diagnosing a benign tumor is 96%. All the 4 malignant lesions were found malignant on histopathology also, so specificity of FNAC in diagnosing a malignant tumor is 100% according to our study. Out of the 2 inconclusive results on FNAC, one found benign and other found malignant in histopathology. Overall in 28 out of 31 cases FNAC was able to correctly stamp a tumor as benign or malignant, so efficacy of FNAC in identifying a tumor as benign or malignant is 90.3% according to our study. (Table 5).

Table (1) : Distribution of cases according to age.

Age group (In years)	No. of cases	Percentage %
< 1	1	0.7
1-10	6	4.3
11-20	13	9.3
21-30	37	26.5
31-40	30	21.4
41-50	25	17.9
51-60	15	10.7
61-70	10	7.1
71-80	3	2.1
Total	140	100%

Table (2): Distribution Of Cases According To Location Of Tumor.

Location	No. of cases	Percentage %
Head & Neck	33	23.6
Upper extremities and axilla	49	35.0
Lower extremities and inguinal region	29	20.7
Chest	8	5.7
Back	11	7.9
Abdomen and perineum	8	5.7
Multiple sites	2	1.4
Total	140	100 %

Table (3) : Spectrum Of Benign Tumors On Cytology.

Diagnosis	No. of cases	Percentage %
Lipoma	67	52.3
Benign fibrous Histiocytoma	8	6.3
Giant cell tumor of tendon sheath	9	7
Fibromatosis	2	1.6
Ganglion	14	10.9
Spindle cell tumor – neural origin	8	6.3
Spindle cells tumor – Benign	19	14.8
Lipofibroma	1	0.8
Total	128	100 %

Table (4) : Spectrum Of Malignant Tumors On Cytology.

Diagnosis	No. of cases	Percentage %
Atypical lipomatoustumor	1	10
Ewing's Sarcoma	3	30
Pleomorphic Sarcoma	4	40
Low grade sarcoma	1	10
Sarcoma – neural origin	1	10
Total	10	100 %

Table (5) : Cytology - Histopathology Comparison Study (31 Cases).

FNAC Diagnosis	Histopathology Diagnosis	No. of case
Benign	Benign	24
Benign	Malignant	1
Malignant	Malignant	4
Inconclusive	Benign	1
Inconclusive	Malignant	1
Total		31

(Note : As we have done only comparison, we did not use any statistical correlation test)

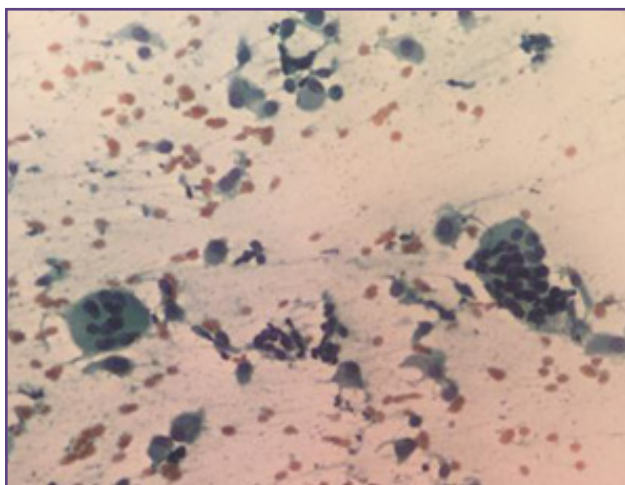


Fig. (1) : Giant Cell Tumour of Tendon Sheath, PAP Stain (40x).

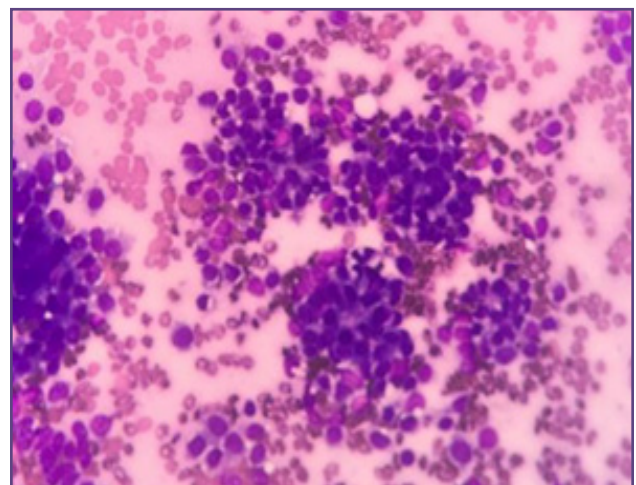


Fig. (2) : Ewing's Sarcoma, MGG Stain (40x).

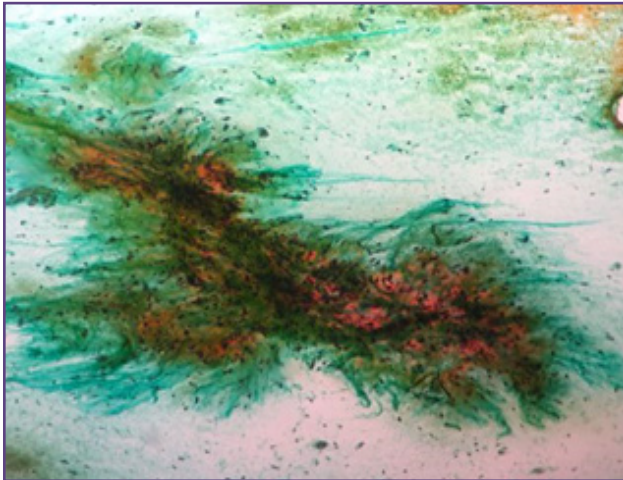


Fig (3) : Benign Fibrous Histiocytoma, PAP Stain (10x).

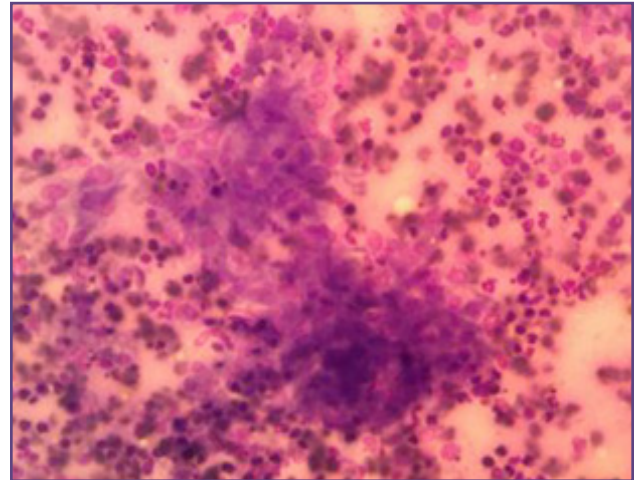


Fig. (4) : Malignant Peripheral Nerve Sheath Tumor, MGG Stain (40x).

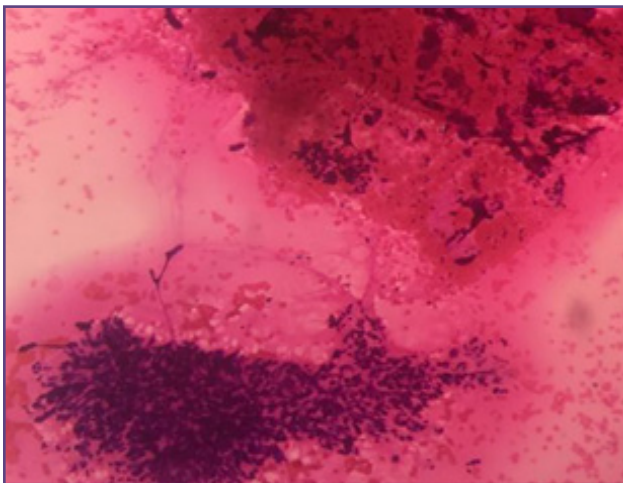


Fig. (5) : High Grade Sarcoma, H&E stain (10x).

Discussion

In present study benign soft tissue tumors were most common in third decade (21-30 years) which is comparable to studies done by Hasan et al, Rekhi et al & Choukimath M. et al, but it is not comparable to study done by Premila J. et al probably due to difference in sample size. (Table – 6) In present study malignant soft tissue tumors were most common in fifth decade (41-50) years, which is comparable to studies done by Chatura et al and Priyanka B. et al & not comparable to other studies may be due to small number of malignant tumors to compare with. (Table – 6)

In present study male to female ratio was 1.4:1 which is almost comparable with other studies except studies done by Hirachand S. et al & Hasan et al (Table 7).

In present study most common site of tumors was upper extremity and axilla which is comparable with studies done

by Tailor HJ et al, Hasan et al and Premila J. et al & not comparable with study of Rasool Z. et al probably due to small sample size. (Table 8).

In present study 91.5% cases were benign which is comparable with almost all other studies clearly showing that benign soft tissue tumors are far more common than the malignant ones (Table 9).

In present study most common type of tumor was adipocytic that is comparable with almost all the studies showing that lipoma is probably the most common soft tissue tumor (Table 10).

Summary

In Present study most common age group was 21-30 years. Least common age group was less than 1 year which was a case of fibromatosis colli. Benign tumors were most common in age group of 21-30 years and malignant tumors were most common in age group of 41-50 years. Male to Female ratio was 1.4:1. In present study most common site of soft tissue tumor was upper extremity & axilla(35%) followed by head and neck area (23.60%).

In present study 91.5% were benign soft tissue tumors, 7.1% were malignant and 1.4% were inconclusive. Most common cytomorphological pattern was lipomatous pattern (47.9%) and second most common was spindle cell pattern (35.0%). In present study most common type of tumor was adipocytic (49%).

Most common benign tumor was lipoma (52.3%). Second most common was ganglion (10.9%). Most common malignant tumor was pleomorphic sarcoma.

In present study efficacy of FNAC to give whether the tumor is benign or malignant is 90.3%. On FNAC 4 cases

Table (6): Comparison of most common age group.

Authors	Most common age group	
	Benign	Malignant
Hasan et al (2012) ⁽³⁾ (136 cases)	21-30	11-20
Premila J. et al (2014) ⁽⁴⁾ (370 cases)	61-70	61-70
Priyanka B. et al (2014) ⁽⁵⁾ (150 cases)	31-40	41-50
Tailor HJ et al (2013) ⁽⁶⁾ (140 cases)	31-40	61-70
Rekhi et al (2007) ⁽⁷⁾ (127 cases)	21-30	61-70
Choukimath M. et al (2012) ⁽⁸⁾ (200 cases)	21-30	21-30
Chatura et al (2015) ⁽⁹⁾ (27 cases)	31-40	41-50
Present study (2015)	21-30	41-50

Table (7) :Comparison Of Gender Distribution.

Authors	Male : Female ratio
Hasan et al (2012) ⁽³⁾	1.9:1
Premila J. et al (2014) ⁽⁴⁾	1.3:1
Tailor HJ et al (2013) ⁽⁶⁾	1.3:1
Priyanka B. et al (2014) ⁽⁵⁾	1.2:1
Choukimath M. et al (2012) ⁽⁸⁾	1.1:1
Hirachand s. et al (2015) ⁽¹⁰⁾ (50 cases)	1:1
Chatura et al (2015) ⁽⁹⁾	1.3:1
Present study (2015)	1.4:1

Table (8) :Comparison According To Location Of Tumor.

Site of tumor	Hasan et al (2012) ⁽³⁾	Premila J. et al (2014) ⁽⁴⁾	Tailor HJ et al (2013) ⁽⁶⁾	Choukimath M. et al (2012) ⁽⁸⁾	Rasool Z. et al (2013) ⁽¹¹⁾ (100 cases)	Present study (2015)
Lower extremity & Inguinal region	21.3%	13.5%	12.1%	18%	15%	20.7%
Upper extremity & axilla	28.6%	27.2%	32.8%	21%	16%	35%
Head & neck	13.9%	30.8%	22.8%	14%	34%	23.5%
Back	14.3%	17.5%	14.2%	10%	12%	7.8%
Chest	7.3%	4.3%	10%	11%	6%	5.7%
Abdomen & Perineum	11.7%	5.4%	2.4%	6%	14%	5.71%
Retroperitoneum	--	--	--	3%	--	--
Multiple sites	2.2%	1%	1.4%	14%	3%	1.4%
Total	136	370	140	200	100	140

Table (9): Comparison Of Benign Vs Malignant Tumor.

	Hasan et al (2012) ⁽³⁾ (%)	Premila J. et al (2014) ⁽⁴⁾ (%)	Priyanka B. et al (2014) ⁽⁵⁾ (%)	Hemalatha A. Et al (2013) ⁽¹²⁾ (%) (113cases)	Tailor HJ et al (2013) ⁽⁶⁾ (%)	Choukimath M. et al (2012) ⁽⁸⁾ (%)	Present study (2015) (%)
Benign	80.9	90.5	95.4	78.8	93.6	76	91.5
Malignant	19.1	9.5	3.3	4.4	6.4	16	7.1
Borderline / Suspicious	-	-	1.3	16.8	-	-	-
Inconclusive	-	-	-	-	-	8	1.4
Total No of cases	136	370	150	113	140	200	140

Table (10) :Comparison Of Type Of Tumor.

Type of tumor	Premila J. et al (2014) ⁽⁴⁾ (%)	Tailor HJ et al (2013) ⁽⁶⁾ (%)	Roy S. et al (2007) ⁽¹³⁾ (%) (105 cases)	Hirachand s. et al (2015) ⁽¹⁰⁾ (%)	Present study (2015) (%)
Adipocytic	50.3	75	25.7	38	48.6
Fibrous	3	0.7	4.8	4	2.1
Fibrohistiocytic	3.2	2.9	9.5	6	12.1
Neural	19.8	4.3	8.6	18	6.4
Myxoid	--	2.9	8.6	--	10
Vascular	20	--	5.7	--	--
Neuroectodermaltumor	0.8	5.8	3.8	--	2.1
Not specified	3	8.6	26.7	26	17.1
Inconclusive	--	--	6.7	8	1.4
Total no of cases	370	140	105	50	140

were diagnosed as malignant tumors and on histopathology all cases were found malignant, so according to our study if any tumor is found malignant in FNAC, it is 100% accurate. On FNAC 25 cases were diagnosed as benign tumors and only one case turned out to be malignant on histopathology, so according to our study if any tumor is found benign in FNAC, it is 96% accurate.

Conclusion

FNAC is a very useful tool for diagnosis of soft tissue tumors, in our study we found that FNAC was 100% accurate in diagnosing malignant tumors, 96% accurate in diagnosing benign soft tissue tumors & 90.3% efficient in identifying whether a tumor is benign or malignant.

Percutaneous fine needle aspiration cytology can be used for initial diagnosis of soft tissue tumors because it is simple, outpatient, rapid, safe, cost effective and non-traumatic procedure which offers sufficient tissue material and permits immediate operative or radiation therapy without lapse of time necessary for wound healing.

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