



CYTO-PATHOLOGICAL STUDY OF SOFT TISSUE TUMORS IN A TERTIARY CARE CENTER- A RETROSPECTIVE STUDY

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ABSTRACT

Background: The diagnosis of soft tissue tumors (STTs) remain challenging to pathologist due to overlap of the clinical and radiological features which are immeasurable and yet to be explored. Fine Needle Aspiration Cytology (FNAC) is considered as standard method of investigation in the diagnosis of STTs. The current study aimed to investigate the convenience and accuracy of FNAC in the diagnosis and management of STT by correlating with histopathological diagnosis.

Materials and Methods: This is a Four years retrospective hospital-based study of soft tissue tumors conducted in the Department of Pathology, Alluri Sitarama Raju Academy of Medical sciences, Eluru. Of 292 FNAC samples, 52 specimens were correlated with histopathological findings.

Results: Majority of the cases were benign (97.6%) and malignant cases were only 2.34%. Incidences were found in all age groups, female predominance seen among benign tumors and malignant tumors were common in males. Benign lesions were commonly seen over upper-limbs (33.7%) followed by trunk (28.8%). Lower limbs accounted for 57.1% and considered to be the commonest site for malignant lesions followed by upper limbs (28.6%).

Conclusion: The study results concluded FNAC as more accurate in diagnosing benign lesions when compared to malignant lesions. Our correlation studies of Histology versus FNAC results found that the overall diagnostic accuracy of FNAC was 96%, sensitivity and specificity being 67% and 98% compared with histopathological studies.

KEYWORDS : Soft tissue tumors, FNAC, Benign tumors

INTRODUCTION

Soft tissue can be defined as non-epithelial extra- skeletal tissue that connects, supports, and surrounds other body structures which includes skeletal muscle, blood vessels, and peripheral nervous system.^[1,2] Soft tissues are derived from the mesoderm with some contribution from the neuroectoderm.

Soft tissue tumors comprise a diverse group of lesions with benign tumors outnumbering the malignant ones by being 100 times more commoner.^[3] Soft tissue tumors (STTs) pose a considerable diagnostic challenge due to their morphologic overlap and biological heterogeneity.^[4] STTs are broadly classified into benign, intermediate, or malignant lesions^[5] and occur in any age group. In addition, most of the patients exhibit painless mass at the time of diagnosis, however one-third of the patients may complain with pain.^[6] It is difficult to ascertain the recent inclination in the incidences of soft tissue tumors are a true indicator for tumors or might be due to advances or availability of better diagnostic facilities in developed or developing countries.

In diagnostic procedures, though histopathological examination remains the gold standard method, fine needle aspiration cytology (FNAC) is the more preferable and prior modality of the method used in the categorization of soft tissue tumors due to its cost-effectiveness and can be implemented as a simple day care procedure.^[7]

The present retrospective study aimed to evaluate the spectrum of the soft tissue tumors in detail on FNAC's based on WHO classification. A total of 292 cases of FNAC smears from soft tissue tumors, diagnosed over a period of four years were studied and cyto-histological correlation was done to evaluate the consistency of cytological findings.

MATERIAL AND METHODS

This is a retrospective study and was approved by the ASRE Ethics Committee, Alluri Sitarama Raju Academy of Medical Sciences, Eluru with IEC registration number IEC/ASR/APPROVAL/029/2019, IEC approval letter dated 18/April/2019. In this study, a total of 292 soft tissue tumor cases were collected and evaluated during the period of January 2016 to December 2019. Relevant clinical data of these patients like age, sex, clinical findings including radiological findings were also recorded.

The study included only soft tissue tumor cases and excluded were tumor-like lesions and tumors arising from the supporting tissue of various organs like uterine leiomyoma.

Comparison study was made between the cytological and histological findings for those specimens having histopathology reports. For the correlation of FNAC diagnoses with histopathological diagnoses the sensitivity, specificity and accuracy values were calculated. Data was compiled in MS Excel and analyzed. Incidences were presented in percentages.

RESULTS

Of 292 cases studied by FNAC, 97.6% (n=285) cases were benign, 0.34% (n=01) cases were intermediate and only 2.05% (n=06) were malignant. Both male and female were affected in the ratio of 1:1.05. The study found that malignant lesions have male preponderance and female predominance among benign tumors.

Age did not show any favourable factor in this study as the incidence of STT is seen in all age groups, but incidences of different tumors increased with age with 92.5% (n=270) cases in the age range between ≥ 21 to ≤ 70 years. The highest incidence (54%) was found in the age group of ≥ 31 to ≤ 50 (table 1).

Table 1: Age wise distribution of soft tissue tumours diagnosed in FNAC

Diagnosis	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Grand Total
Benign fibrous histiocytoma	0	0	01	0	0	0	0	0	01
Benign Spindle Cell Neoplasm	02	01	02	02	05	0	0	0	12
DFSP	0	0	0	01	0	0	0	0	01
Ganglion	0	01	0	02	01	0	0	0	04

GCT of Tendon Sheath	0	01	0	01	0	0	0	0	02
Haemangioma	01	01	01	0	0	01	0	0	04
Lipoma	10	37	72	69	36	20	4	3	251
Malignant Fibrous Histiocytoma,	0	0	0	01	0	0	0	0	01
Malignant round cell tumour	0	02	0	0	0	0	0	0	02
Malignant Spindle Cell Neoplasm	0	0	0	0	0	01	0	0	01
Myositis ossificans	0	0	01	0	0	0	0	0	01
Neurofibroma	01	01	01	0	0	0	01	0	04
Ossifying Fibroma	0	0	0	0	0	01	0	0	01
Sarcoma	0	0	0	0	01	0	0	0	01
Schwannoma	0	0	02	01	02	0	0	0	5
Synovial Sarcoma	0	0	0	01	0	0	0	0	1
Grand Total	14	44	80	78	45	23	5	3	292

Adipocytic tumors 85.9% (n=251) accounted for the major chunk in this study followed by benign spindle cell neoplasms 4.1% (n=12). (table 2).Of these 292 cases, Dermatofibrosarcoma protuberance [0.34% (n=1)] was the only case diagnosed in the Intermediate malignant lesion group.

Table 2: Spectrum of benign lesions diagnosed on FNAC

S: NO	Benign lesions	No of cases
1	Lipoma	251 (88.07%)
2	Benign spindle cell neoplasm	12 (8.57%)
3	Schwannoma	5 (1.75%)
4	Neurofibroma	4 (1.40%)
5	Haemangioma	4 (1.40%)
6	Ganglion cyst	4 (1.40%)
7	Giant cell tumour of tendon sheath	2 (0.70%)
8	Fibrous histiocytoma	1 (0.35%)
9	Myositis ossificans	1 (0.35%)
10	Ossifying fibroma	1 (0.35%)
	Total	285

Malignant STSs were seen in only 2.05% (n=6) cases.Among the 6 cases,two cases(33.33%) were Malignant round cell tumor type whereas Undifferentiated sarcoma, Malignant spindle cell neoplasm, Sarcoma, and Synovial sarcoma accounts for each 1 case by FNAC (table 3).

Table 3: Spectrum of Malignant lesions diagnosed on FNAC

S: NO	Malignant lesions	No of cases
1	Malignant round cell tumors	02 (33.33%)
2	Undifferentiated sarcoma	01 (16.66%)
3	Malignant spindle cell neoplasm	01 (16.66%)
4	Sarcoma	01 (16.66%)
5	Synovial sarcoma	01 (16.66%)
	Total	06

With regard to site of STTs, benign lesions were commonly seen in over upper-limbs (33.7%) followed by trunk (28.8%), lower limbs accounted for 57.1% and considered to be the commonest site for malignant lesions followed by upper limbs (28.6%).

In this study, we have correlated FNAC findings with Histopathological studies wherever data and slides are available. Histopathological data were available for a total of 52 cases. Among 52 neoplasms, benign neoplasms were 48 and 4 cases were malignant. Of these 48 benign neoplasms, cytohistological correlation was seen in 46 cases and there were 2 discordant cases. Among the 46 correlated cases, lipoma and its variants accounted for 37 cases, 1case of myxoma, 3 pyogenic granulomas, one benign fibrous histiocytoma, and 2 cases each in ancient schwannoma, and plexiform neurofibroma. Among the two discordant cases, one was reported as lipoma in terms of cytology and as ossifying fibromyxoid tumor in histopathology. Another case was reported as benign spindle cell neoplasm on cytology which turned out to be Dermatofibrosarcoma Protuberans (DFSP) on histopathology which was of intermediate grade.

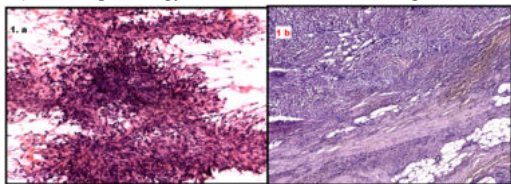


Figure 1: 1a Showing the Cytology image of Dermatofibrosarcoma

Protuberans (DFSP), 1b Showing the Dermatofibrosarcoma Protuberans (DFSP) on histopathology.

In our study, one case of DFSP was reported on cytology which was correlated further on histology too. (Fig.1). Out of the 6 malignant cases reported on cytology, the histopathological correlation was obtained only for 3 cases which include 2 malignant round cell tumors turned out to be Ewings sarcoma and 1 sarcoma as undifferentiated sarcoma in histology (Table 4) (Fig 2).

Table 4: Showing the correlation results between FNAC and Histopathology

S: No	FNAC diagnosis	Total no of cases n=52	Histopathologic findings	Total no of cases n=52
1	Lipomas	40	Lipoma and its variants	37
			Myxoma	1
			Ossifying Fibromyxoid Tumour (Discordant)	1
			Pyogenic Granuloma	1
2	Benign Spindle cell Neoplasms	04	Ancient Schwannoma	1
			Plexiform Neurofibroma	1
			Pyogenic Granuloma	1
			DFSP(Discordant)	1
3	Benign Fibrous Histiocytoma	1	Benign Fibrous Histiocytoma	1
			Haemangioma	1
			Neurofibroma	1
			Schwannoma	1
4	Malignant Round Cell Tumour	2	DFSP	1
			Ewings Sarcoma	2
	Sarcoma	1	Undifferentiated Sarcoma	1

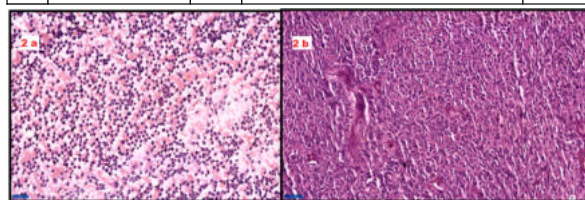


Figure 2: 2a Showing the Cytology image of Malignant round cell tumor, 2b Showing the Malignant round cell tumor on histopathology.

The overall diagnostic accuracy of FNAC is 96%, sensitivity of 67%, and specificity of 98%.

DISCUSSION

The primary objective of this retrospective study was to evaluate the spectrum of the soft tissue tumors in detail on FNAC based on WHO classification. In this study, a total of 292 Soft tissue tumor specimen samples were studied by FNAC. Of these 292 cases, only 2.4% cases were malignant tumors and 97.6 % were benign tumors. A 3-year retrospective study by Chakrabarti PR. et al^[11] had similarly reported the incidence of benign tumors as 93.3%, 0.6% intermediate, and 6% malignant soft tissue tumors. In this study, STSs are more common in females than males where the ratio showed 1:1.05, but the difference

was negligible. Previous studies found that these tumors are more common in males than females ratio ranging from 1.3:1 to 2.1:1.^[8,9,12] The site of soft tissue tumors in the present study was correlated with the previous publication by Soni PB et al.,^[16] and Chaitanya K et al.,^[17] where Upper limbs were the most common site for benign lesions and lower limbs for Malignant lesions.

The second objective of this study was to calculate the diagnostic accuracy of FNAC and to correlate the cytomorphological and histopathological diagnosis. In the present study, a total of 52 cases were correlated. Among the 48 benign cases in histopathology, 46 cases were concordant with the cytological findings and only two cases were discordant.

The overall diagnostic accuracy of FNAC from this study was 96% and this is near to the diagnostic accuracy of Chaitanya K et al.,^[17] (97.3%) and Soni PB et al.,^[16] (96%), whereas the sensitivity of this study was 67% similar to Soni PB et al and specificity was 98% similar to Chaitanya K et al^[17].

CONCLUSION

The present study results concluded that Fine Needle Aspiration Cytology(FNAC) was found to be a standard procedure for early diagnosis of soft tissue tumors with minimal complications and low cost. The results have shown that FNAC was more accurate in diagnosing benign lesions as compared to malignant lesions.

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