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HISTOPATHOLOGICAL ANALYSIS OF SOFT TISSUE TUMORS IN JLN MEDICAL COLLEGE AJMER

Pathology

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ABSTRACT

Introduction: Soft tissue tumors (STTs) originate from non-epithelial, extraskeletal structures, include tissues like adipose, fibrous connective tissue, skeletal muscle, blood vessels, peripheral nerves. Histopathology remains the gold standard, Fine Needle Aspiration Cytology (FNAC) plays a vital role for superficial masses. **Objectives:** To determine the distribution of age, sex, and site in STTs, to assess the relative incidence of benign, intermediate and malignant tumors. **Methods** The study was carried out on 100 patients with palpable soft tissue lumps over a two-year period from January 2023 to December 2024 in the Department of Pathology, JLN Medical College, Ajmer. Histopathological diagnosis was established on formalin-fixed, paraffin-embedded tissue sections using routine H&E stains. Special stains were used as needed. **Observations:** Of the 100 STTs, 96% were benign, 1% intermediate, 3% malignant. Benign tumors were common in the 30-40 age group (21.88%), with a higher incidence in males (55) than females (45). **Conclusion:** Benign STTs predominate, commonly in extremities, adipocytic tumor (mostly lipomas).

KEYWORDS

Soft tissue tumors (STT), benign tumors, malignant tumor, adipocytic tumor.

INTRODUCTION

Soft tissue comprises tissues other than epithelial tissues and does not include the skeleton, joints, central nervous system, hematopoietic, and lymphoid tissues. They include adipose tissue, fibrous connective tissue, skeletal muscle, blood vessels, and the peripheral nervous system. Soft tissues are almost entirely derived from the mesoderm except for the peripheral nerves[1]. Soft tissue is derived embryologically from mesoderm with some contribution from neuroectoderm[2].

The majority of soft tissue tumors tend to develop in the extremities, particularly the thigh, with approximately 15% occurring in children. Furthermore, the incidence of soft tissue tumors tends to increase with age.[3, 4]. Light Microscopic evaluation of hematoxylin-eosin stained section is still the standard technique for the diagnosis of these tumor malignancies[5]. Grading of malignant tumors is the most established criteria for predicting the biological behaviour of these tumors which is not essential to give proper therapy[6], but it is confirmed by immunohistochemistry, cytogenetics and electron microscopy for the precise role diagnosis[7]. Clinical history like age, duration, location, size, imaging studies, and histopathology are the most reliable parameters to make an accurate diagnosis, and to predict the clinical behavior of the tumor.[8] Histopathology is considered the gold standard method for the diagnosis of soft tissue tumors. Different special stains like Masson's trichome, Verhoeff – Van Gieson and Periodic Acid Schiff stain and immunohistochemistry are applied to increase the diagnostic accuracy of soft tissue tumors.[9] The criteria used for grading soft tissue tumors include cellularity, mitotic count, tumor differentiation and necrosis. Prognosis of soft tissue tumors mainly depend on tumor size, microscopic grade, location, margins, clinical staging, DNA ploidy and genetic alterations[10].

The purpose of this study was to determine the distribution of age, sex, and site in soft tissue tumors. It aimed to assess the relative incidence of benign and malignant tumors within the study population.

OBJECTIVES:

To evaluate the efficacy of Fine Needle Aspiration Cytology in diagnosing soft tissue tumors by comparing cytology results with histopathology, and to analyze the demographic and pathological profile of these tumors. To assess FNAC efficacy, determine age, sex, and site distribution patterns, calculate the incidence of benign, intermediate, and malignant tumors, and compare findings with other Indian and global studies.

MATERIAL AND METHODS

The prospective study "**HISTOPATHOLOGICAL ANALYSIS OF SOFT TISSUE TUMORS IN JLN MEDICAL COLLEGE AJMER"** was carried out in the Department of Pathology, Jawahar Lal Nehru medical college Ajmer (Rajasthan), from January 2023 to December 2024.

Methodology:

Tissue specimens were fixed in 10% formalin, grossly examined, and sliced (<5mm thick). They were processed, paraffin-embedded, sectioned (3-5 microns), and stained for histopathological examination[8]. Special stains (PAS, mucicarmine) were used as needed for diagnosis and characterization of soft tissue tumors.

RESULTS:

The study was conducted in the Department of Pathology, JLN Medical College, Ajmer, during the year January 2023 onwards to December 2024. This study involved 100 soft tissue tumors were studied in the present study. Histopathological diagnosis was first established on these sections using the routine haematoxylin and cosin (H&E) stains. The data obtained was recorded and analyzed. The final observations and results were tabulated, bar diagram or pie charts were prepared.

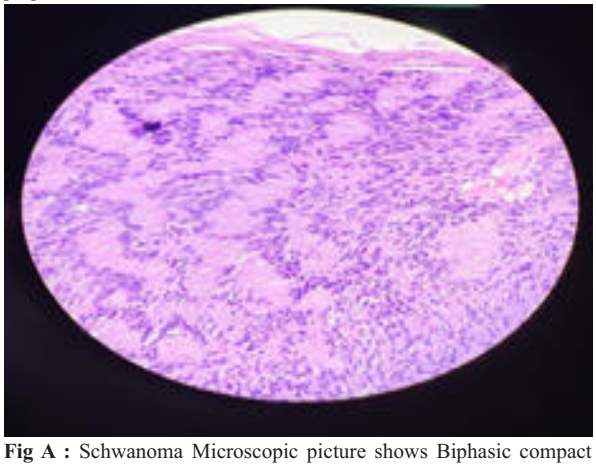

Fig A : Schwanoma Microscopic picture shows Biphasic compact hyper cellular Antoni A areas and myxoid hypocellular Antoni B areas (H&E Stain 10 X Magnification)

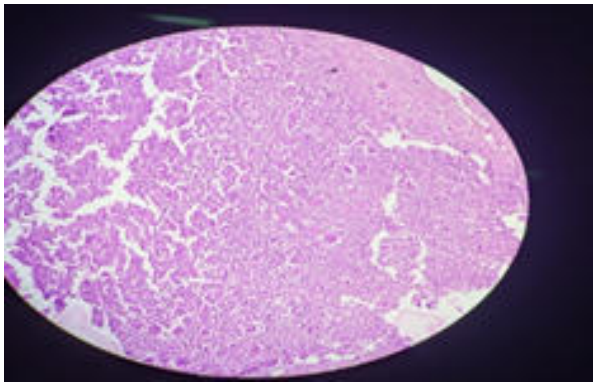

Fig B: Tenosynovial Gaint cell tumor microscopic picture shows multinucleated osteoclast like giant cells and Foamy macrophase (H&E Stain 10 X Magnification)

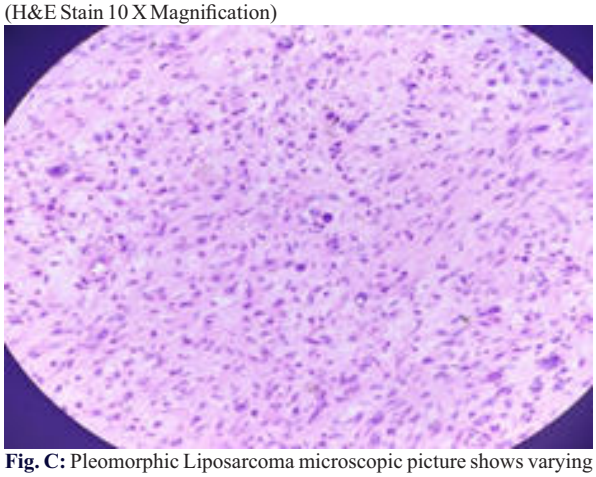

Fig. C: Pleomorphic Liposarcoma microscopic picture shows varying adipocytes size a typical hyperchromatic nucles in adiposcytes & stromal cells (H&E Stain 40 X Magnification)

Table 1 : Age Wise Distribution Of Histopathological Diagnosed Soft Tissue Tumors

S. No.	Age Group (years)	Type of Soft Tissue Tumors						Total
		Benign		Intermediate		Malignant		
		No. of Cases	%	No. of Cases	%	No. of Cases	%	
1	0-10	1	1.04	0	0.00	0	0.00	1
2	11-20	5	5.21	0	0.00	1	33.33	6
3	21-30	17	17.71	0	0.00	0	0.00	17
4	31-40	21	21.88	0	0.00	2	66.67	23
5	41-50	19	19.79	0	0.00	0	0.00	19
6	51-60	18	18.75	0	0.00	0	0.00	18
7	61-70	12	12.50	1	100.00	0	0.00	13
8	71-80	3	3.13	0	0.00	0	0.00	3
Total	96	100.00	1	100.00	3	100.00	100	

Table - 2 : Gender Wise Incidence Of Histopathological Diagnosed Soft Tissue Tumors According To Cell Of Origin

S. No.	Histopathological Diagnosis	Benign		Intermediate		Malignant		Total	
		Male	Female	Male	Female	Male	Female	Male	Female
1	Adipocytic Tumors	35	37	0	0	0	1	35	38
2	Fibroblastic/Myofibroblastic Tumors	3	2.00	1	0	0	0.00	4	2
3	SO-Called Fibrohistiocytic Tumors	1	0.00	0	0	0	0.00	1	0
4	Vascular Tumors	2	0.00	0	0	0	0.00	2	0
5	Peripheral Nerve Sheath Tumors	5	3.00	0	0	1	0.00	6	3
6	Tumors of Uncertain Differentiation	0	0.00	0	0	1	0.00	1	0
7	Others	6	2.00	0	0	0	0.00	6	2
	Total	52	44	1	0	2	1	55	45

Table - 3 Distribution Of Cases According To Histopathological Origin Of Soft Tissue Tumors

S. No.	Histopathological Diagnosis	Benign		Intermediate		Malignant	
		No. of Cases	%	No. of Cases	%	No. of Cases	%
1	Adipocytic Tumors						
	Lipoma	66	68.75	0	0	0	0.00
	Fibrolipoma	5	5.21	0	0	0	0.00
	Myxolipoma	1	1.04	0	0	0	0.00
	Pleomorphic lipoma / Atypical lipomatous tumor	0	0.00	0	0	1	33.33
2	Fibroblastic/Myofibroblastic Tumors						
	Fibroma	2	2.08	0	0	0	0.00
	Fibromyxoma	1	1.04	0	0	0	0.00
	Nodular fascitis	1	1.04	0	0	0	0.00
	Dermatofibroma	1	1.04	0	0	0	0.00
	Dermatofibromasarcoma	0	0.00	1	100	0	0.00
3	SO-Called Fibrohistiocytic Tumors						
	Gaint cell tumor (Tenosynovial)	1	1.04	0	0	0	0.00
4	Vascular Tumors						
	Hemangioma (Capillary)	2	2.08	0	0	0	0.00
5	Peripheral Nerve Sheath Tumors						
	Neurofibroma	5	5.21	0	0	0	0.00
	Malignant peripheral nerve sheet tumor ; sarcoma	0	0.00	0	0	1	33.33
	Schwannoma	3	3.13	0	0	0	0.00
6	Tumors of Uncertain Differentiation						
	Sarcoma	0	0.00	0	0	1	33.33
7	Others						
	Benign spindle cell lesion	8	8.33	0	0	0	0.00
	Total	96	100.00	1	100	3	100.00

DISCUSSION

The study entitled "**HISTOPATHOLOGICAL ANALYSIS OF SOFT TISSUE TUMORS IN JLN MEDICAL COLLEGE AJMER"** was conducted in the Department of Pathology, JLN Medical College, Ajmer and associated group of hospitals, during the year January 2023 onwards to December 2024. This study involved 100 soft tissue tumors were studied in the present study. Benign soft tissue tumors were 96 in numbers, Intermediate tumor was 1 in number and Malignant tumors were 3, consisting 96%, 1% and 3% respectively.

The majority of benign soft tissue tumors occurred in the 31-40 age group (21.88%), followed by the 21-30 age group (17.71%), and the 41-50 age group (19.79%). This finding is partially consistent with Solanki P et al. (2018)[11], who reported a similar age distribution, with 27.22% of tumors occurring in the 41-50 age group, 21.52% in the 21-30 age group, and 15.19% in the 31-40 age group. Thaker BD et al. (2017)[12] reported a different age distribution, with 42.22% of tumors occurring in the 31-40 age group, 15.55% in the 41-50 age group, and 13.33% in the 21-30 age group. Jobanputra GP et al. (2016)[13] reported a **similar age distribution to our study**, with 26.4% of tumors occurring in the 31-40 age group, 19.2% in the 21-30 age group, and 15.2% in the 41-50 age group. **(Table 1)**

The incidence of the gender-wise distribution of histopathologically diagnosed soft tissue tumors are consistent with those reported by

other authors. Mucharla R et al. (2024)[14] and Thaker BD et al. (2017)[12] also reported a higher proportion of benign soft tissue tumors in males, while Pagaro PM et al.[15] (2019) found a higher proportion of benign tumors in females. The variation in incidence across studies may be attributed to differences in population demographics, sample size, or tumor types. However, our study's findings suggest that benign soft tissue tumors are more common than intermediate and malignant tumors. **(Table 2)**

CONCLUSION

The diagnosis and management of soft tissue tumors require a team perspective. Even though soft tissue sarcoma are rare and usually present just as painless mass, the clinician must be able to diagnosis it early for better management. A careful gross examination of the specimen and adequate sampling of the tumor is essential as morphological pattern vary in different area. Special stains and immuno histochemistry are helpful in addition to the routine Haematoxylin and eosin for the proper diagnosis of STTs and to indicate the prognosis and guide the further course of management.

In conclusion, this study provides valuable insights into the clinical and histopathological characteristics of soft tissue tumors. The findings suggest that soft tissue tumors are more common in the upper and lower extremities, and the majority of them are benign and originate from adipocytic tissue. The most common clinical diagnosis is lipoma, and the majority of patients present with swelling alone. These findings are consistent with previous reports and highlight the importance of early diagnosis and treatment of soft tissue tumors.

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