

**Research Article****Clinicomorphological Assessment of Soft Tissue Tumors****Pramila Jain, Archana Shrivastava\*, Reeni Malik**

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**Abstract:** Soft tissue is a nonepithelial extra skeletal tissue of the body exclusive of reticuloendothelial system, glia and supporting tissue of the various parenchymal organs. It is represented by the voluntary muscles, adipose tissue and fibrous tissue along with the vessels serving these tissues. They are classified according to the tissue they recapitulate (muscle fat, fibrous tissue, vessels and nerves). The present study comprises of all the soft tissue tumors, both benign and malignant obtained from the teaching institute affiliated to the tertiary health care centre of Madhya Pradesh Government. Retrospective study was undertaken for a period of 5 years starting from July 2008 to July 2013. The tissue were fixed in 10% formalin and processed through standard paraffin embedding technique. Sections of approximately 5 was taken and stained by routine hematoxylin and eosin. The soft tissue tumours (370 cases) recorded in the department of pathology in 5 years. Benign soft tissue tumours formed 90.6% of all soft tissue tumours while malignant soft tissue tumours constituted 9.4% of all soft tissue tumours with a benign to malignant ratio of 9.4. Malignant soft tissue tumours had a peak age incidence in the 6th decade. Soft tissue tumours in general had slightly male preponderance with a male to female ratio of 1.2. The male to female ratio among the benign soft tissue tumours was 1.2:1 and among the malignant soft tissue tumours was 1.9:1. The benign soft tissue tumour had predilection for extremities and head and neck. Availability of a modern, more logical histopathologic classification and standard nomenclature now offers a better clinico pathological co-relation. The clinicomorphological evaluation is still the gold standard for the proper diagnosis of soft tissue tumors.

**Keywords:** soft tissue tumors, clinicomorphologic, adipose

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**INTRODUCTION**

Soft tissue tumors are defined as mesenchymal proliferations, that occur in extra skeletal, nonepithelial tissue of the body, excluding the viscera coverings of brain, and lymphoreticular system.

Like many other malignant tumors, the pathogenesis of most soft tissue tumors is still unknown. Recognized causes include various chemical and physical factors, exposure to ionizing radiation, inherited or acquired immunological defects. Evaluation of the exact cause is difficult because of the long latent period.

Soft tissue tumors can occur at any age. It has been noted that the histological distribution of soft tissue tumors are rather specific for a particular age group at a particular anatomical site [1, 2]. Both benign and malignant soft tissue tumors commonly present as a painless mass. When a soft tissue mass arises in a patient with no history of trauma or when a mass persisting even after 6 weeks after a local trauma a biopsy is indicated.

A core biopsy, an excisional biopsy and an incisional biopsy are the appropriate technique used for diagnosing most soft tissue masses. Open biopsy has long been considered the gold standard for diagnosis of an extremity soft tissue mass [7].

Fine needle aspiration cytology has a role to play in the diagnosis of soft tissue lesions and should guide by CT scans in intra abdominal and retroperitoneal lesions. FNAC is a traumatic and is very useful to document local recurrences of metastasis in a previously diagnosed soft tissue sarcoma [3].

Soft tissue tumor & tumor like lesions have fascinated pathologist for many years because of their remarkably wide variety and the close histopathologic similarities between certain tumors with only subtle difference detectable on careful microscopic examination, thus posing a diagnostic challenge to histopathologist.

They arise nearly everywhere in the body, the most important locations being the extremities, trunk, abdominal cavity and head & neck region [4].

It is sometimes possible to make an accurate diagnosis by detail clinical history, physical examination and naked eye examination of the tumors. Clinical features like age of the patient, location & size of the tumor help greatly in narrowing down the differential diagnosis.

There are special techniques that have been successfully applied to increase diagnostic accuracy; these include conventional special stains, electron microscopy, immunohistochemistry and cytogenetic / molecular methods.

Availability of a modern, more logical histogenetic classification and standard nomenclature now offers a better clinico pathological correlation.

**Aims and Objectives**

- To study the Clinico pathological correlation of soft tissue tumors in our institute.
- To find out the relative incidence of benign & malignant soft tissue tumors in our institute.
- To study the frequency of age, sex & site distribution of these cases.
- To study the histo-pathological pattern for understanding the classification & type of soft tissue tumour.

**MATERIAL & METHODS**

The present study comprises of all the soft tissue tumors, both benign and malignant obtained from the teaching institute affiliated to the tertiary health care centre of Madhya Pradesh Government. Retrospective study was undertaken for a period of 5 years starting from July 2008 to July 2013. Detailed clinical data including history, clinical features, USG, Radiological findings and gross findings was taken from histopathology record section. The blocks were recut and stained by routine H&E stain.

The tissue were fixed in 10% formalin and processed through standard paraffin embedding technique. Sections of approximately 5 was taken and stained by routine hematoxylin and eosin. Special stains like PAS and reticulin, PTAH were also done wherever necessary in studies. They were further examined microscopically and grading was done according.

**OBSERVATIONS & RESULTS**

The study was performed over a period of 5 years from July 2008 to July 2013. During this period total 15,251 surgical specimens were received for histopathological examination in the histopathology section of our hospital. Out of these, 370 specimens were soft tumors.

**Table 1: Relative incidence of benign & malignant soft tissue tumours**

Type	No. of soft tissue tumours	Percentage
Benign	335	90.60%
Malignant	35	9.40%
Total	370	100%

**Table 2: Age & Sex incidence in soft tissue tumours**

Age in yrs	Sex		Total
	Male	Female	
0-10	11	16	27
11-20	31	23	54
21-30	25	16	41
31-40	27	17	44
41-50	34	25	59
51-60	34	35	69
>61	44	32	76
Total	206	164	370

**Table 3: Sex Incidence of All SSTS**

Category	Sex		Total
	Male (%)	Female (%)	
Benign	184 (49.72%)	151 (40.27%)	335
Malignant	23 (6.21%)	12 (3.24%)	35
Total	207 (55.94%)	163 (44.05%)	370

**Table 4: Incidence of Benign & Malignant Soft Tissue Tumors**

Type	Category of Soft tissue tumors		Total (%)
	Benign (%)	Malignant (%)	
Adipocytic	175 (47.29%)	11 (2.97%)	186 (50.27%)
Fibrous	11 (2.97%)	0	11 (2.97%)
Fibrohistiocytic	07 (1.89%)	05 (1.35%)	12 (3.24%)
Smooth Muscle	02 (0.54%)	4 (1.08%)	06 (1.62%)
Skeletal Muscle	0	05 (1.35%)	05 (1.35%)
Blood Vessels	70 (18.91%)	04 (1.08%)	74 (20%)
Peripheral nerve sheath tumors	69 (18.64%)	04 (1.08%)	73 (19.72%)
Tumors of uncertain differentiation	01 (0.27%)	02 (0.54%)	03 (0.81%)
Total	335 (90.54%)	35 (9.45%)	370 (100%)

**Table 5: Site distribution of Benign and Malignant Soft Tissue tumours**

Sl. No.	Site	Benign	Malignant	Total
1.	Extremities	111	20	131
2.	Head and Neck	108	06	114
3.	Back and Shoulder	76	01	77
4.	Trunk and Abdomen	36	08	44
5.	Others	04	00	04
Total		335	35	370

**RESULTS**

The present study is a clinicopathological study of 370 cases of soft tissue tumours recorded in the department of Pathology in our hospital over a period of 5 years (July 2008 – July 2013). The following conclusions were drawn.

- The soft tissue tumours (370 cases) recorded in the department of pathology in 5 years.
- Benign soft tissue tumours formed 90.6% of all soft tissue tumours while malignant soft tissue tumours constituted 9.4% of all soft tissue tumours with a benign to malignant ratio of 9.4..
- Malignant soft tissue tumours had a peak age incidence in the 6<sup>th</sup> decade.
- Soft tissue tumours in general had slightly male preponderance with a male to female ratio of 1.2
- The male to female ratio among the benign soft tissue tumours was 1.2:1 and among the malignant soft tissue tumours was 1.9:1.
- The benign soft tissue tumour had predilection for extremities and head and neck.
- The malignant soft tissue tumours had predilection for the lower extremities.
- Majority of the soft tissue tumours presented as a painless mass of duration ranging form 3 months to 3 years.
- On detailed histomorphological examination, the single most common histological group was the adipose tumours.
- The commonest benign tumour was lipoma (50.27%) of all benign tumours of soft tissue followed by vascular tumours (20%),

peripheral nerve sheath tumours (19.7%), fibrous tumours (2.9%), fibrohistiocytic tumours (2.34%) smooth muscle tumours and tumours of uncertain differentiation (0.81%) in the decreasing order to frequency.

**DISCUSSION**

Soft tissue is a nonepithelial extra skeletal tissue of the body exclusive of reticuloendothelial system, glia and supporting tissue of the various parenchymal organs. It is represented by the voluntary muscles, adipose tissue and fibrous tissue along with the vessels serving these tissues. They are classified according to the tissue they recapitulate (muscle fat, fibrous tissue, vessels and nerves). Some soft tissue tumours have no normal tissue counterpart but have consistent clinicopathologic features warranting their designation as distinct entities.

In present study the frequency of benign tumour was 90.6% and malignant tumours was 9.4% which is in between study of Myher Jensen *et al.* [5] and Lazxim *et al.* [6], whereas M.J. Kransdorf *et al.* [2, 3] reported 60.2% benign and 39.8% malignant soft tissue tumour in their study. Petersen *et all*[11] done a retrospective and found 49% malignant, 11.4% intermediate ,35% benign and 4.6% as tomors of uncertain potential. In other study of soft tissue tumors of head and neck by Makino [15] stated 96% tumors as benign and 45 % as malignant. In all there studies benign tumours predominated over malignant tumours.

The relative frequency of benign to malignant soft tissue tumours is difficult to estimate accurately

since many of the benign tumours cause not much problems and patients do not report to the clinicians and also most benign lesions are not removed.

All around the world many workers analyzed various aspects of soft tissue tumours like age and sex distribution, site, clinical features etc. which have been published in many literature. Specific sarcomas tend to appear in certain age groups.

There is male preponderance in almost all soft tissue tumour. In the present study there were 206 males and 164 female out of total 370 causes of soft tissue tumour with male to female ratio 1.2:1 which is equal to the study of M.S. Kransdorf *et al.* [1]. Our study is also comparable with studies of Mynes Jensen *et al.* [5] and Beg [3] where M:F were 1:1 and 1.8:1 respectively. In present study peak incidence is in age above 61 years followed by age group 51-60 years. Lazim *et al.* [6] studied 213 cases of soft tissue tumours in one year and reported a male preponderance in all soft tissue tumour with M:F ratio of 1.7:1. Mandong *et al.* [9] done ten years retrospective study of soft tissue sarcomas and reported male to female ratio 2: 1., which is very close to study of Abudu *et al.* [12] where male to female ratio was 1.9:1. Agravat *et al.* [10] studied 100 cases of soft tissue tumors. Of these 86% were benign, 6% malignant, 2% borderline and 6% were tumor like lesions

The adipocytic tumour (50.27%) are most common soft tissue tumours followed by vascular tumours (20%) and peripheral nerve sheath tumours (19.72%). There is a highly significant association between the type of tumours and the category of tumours. The benign adipocytic tumours accounted for the majority of benign soft tissue tumours (47.29%) followed by vascular tumours (18.91%). Benign tumours of smooth muscle and tumours of uncertain differentiation are less (1%) encountered.

The malignant tumours of adipose tissue accounted for majority of malignant soft tissue tumours (2.97%) followed by tumours of skeletal muscle, blood vessels and peripheral nerve. Myhre-Jensen [5] reported most common benign soft tissue tumours were of adipocytic (48.1%) constitute majority of lipoma followed by benign fibrohistocytic tumours (15.8%).

Regarding the site of soft tissue tumours in fair number of studies commonest site was extremities. Soft tissue tumors may arise in any location although approximately 40% occur in lower extremities.

In present study 33.13% benign soft tissue tumours were seen in extremities followed by head and neck 32.23% which is comparable with Beg *et al.* studies [3]. The studies by Lazim, Beg and Zhi *et al.* [6-8] state commonest site was extremities for the malignant soft tissue tumours mainly lower extremities followed by trunk and abdomen. Whereas in case of

Madong *et al.* [9]; extremities followed by head and neck.

Meis-Kindblom *et al.* [13] studied eighty cases of angiosarcoma and found most common site was extremities. A study of MPNST from 200 soft tissue sarcomas by Kar *et al.* [14] reported extremities as most common site followed by chestwall and trunk, pelvis and head and neck.

The malignant soft tissue tumours were observed to have a strong predilection for extremities 57.14% specifically lower extremities, followed by trunk and abdomen 22.85%. The predilection is confirmed by the studies of Kransdorf [1, 2]. Gebhard *et al.* [16] studied clinicopathologic and immunohistochemical features of pleomorphic liposarcomas and found lower extremities as most common site of occurrence. Studies by Olivera AM *et al.* [17] and Weiss SW *et al.* [18] on extra skeletal myxoid chondrosarcoma and MFH respectively also reported extremities as most common site that too lower extremities more than upper extremities.

Accurate histologic classification contributes significantly to establishing the prognosis of sarcoma. Important diagnostic features are cell morphology and architectural arrangement; often these features are not sufficient to distinguish one sarcoma from another, particularly with poorly differentiated aggressive tumors. Whatever the type, the grade of a soft tissue sarcoma is important in predicting its behavior. Grading is largely based on degree of differentiation, average number of mitosis per high power field, cellular pleomorphism and extent of necrosis.

In general tumors arising in superficial locations have better prognosis than deep seated lesions.

## **Conclusion**

The diagnosis and management of soft tissue tumors require a team perspective. Even though soft tissue sarcomas are rare and usually present just as painless mass, the clinician must be able to diagnose it early for better management.

A careful gross examination of the specimen and adequate sampling of the tumour is essential. Immunohistochemistry and Special stains are helpful in addition to the routine Haematoxylin and eosin for the proper diagnosis of Soft tissue tumours.

Availability of a modern, more logical histopathologic classification and standard nomenclature now offers a better clinico pathological co-relation.

The clinicomorphological evaluation is still the gold standard for the proper diagnosis of soft tissue tumors.

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