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Original Research Paper

Pathology

"SPECTRUM OF SOFT TISSUE NEOPLASMS – 5 YEAR EXPERIENCE AT A TERTIARY HEALTH CARE CENTRE"

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ABSTRACT Soft tissue neoplasms arise from the primitive mesoderm, with some contribution from the neuroectoderm. They have a male predominance, occur mostly on the extremities and are mostly benign with varying degree of differentiation or histologic grade.

We have undertaken a 5-year retrospective study of 510 cases of soft tissue neoplasms with the aim to highlight the most common types of soft tissue neoplasms, their age- and sex-incidences, site-specific distribution and their spectrum of differentiation and staging.

The study revealed that soft tissue neoplasms accounted for 2.9% of all biopsy samples received in the 5-year period. Among these, 80% cases were benign, 4.7% were of intermediate grade, and 15.3% were found to be malignant soft tissue neoplasms. Highest incidence was seen in the 21-30 years age group (24.1%), followed by 31-40 years (21.6%) and 41-50 years (20%). 61.4% of the patients were male showing a 1.6:1 male predominance. Adipocytic tumors (49%) were the most common benign type, followed by vascular tumors (34.8%). Fibroblastic/ myofibroblastic type was the most common intermediate type (83.3%), while among the malignant tumors most common were tumors of uncertain differentiation (20.5%) followed by undifferentiated/unclassified sarcomas (17.9%). Lipomas (28.2% of total cases) were the most common soft tissue tumor in this study. Lower extremity was the most common site (36.6%), followed by upper extremity (21.1%).

KEYWORDS : Soft Tissue Neoplasms, Adipocytic Tumors, Vascular Tumors, Sarcomas.

INTRODUCTION

Soft tissue is loosely defined as the complex of nonepithelial extraskeletal structures of the body and is composed of fibrous (connective) tissue, adipose tissue, skeletal muscle, blood and lymph vessels, and peripheral nervous system. All soft tissue neoplasms arise from common embryonic ancestry called the primitive mesoderm with some contribution from neuroectoderm. Tumors of these connective tissues are referred to as Soft tissue sarcomas.

Benign soft tissue tumours outnumber sarcomas by at least 100 to 1, mostly located in superficial (dermal or subcutaneous) soft tissue. By far the most frequent benign lesion is lipoma. Some non-metastasizing lesions, such as desmoid-type fibromatosis or intramuscular haemangioma, require wide excision comparable to a sarcoma, otherwise local recurrence is very frequent. Since excisional biopsy or 'shelling out' of a sarcoma is inappropriate and often may cause difficulties in further patient management, it is generally advisable to obtain a diagnostic biopsy (prior to definitive treatment) for all soft tissue masses >5 cm (unless a very obvious subcutaneous lipoma), and for all sub-fascial or deep-seated masses, almost irrespective of size.

Most soft tissue sarcomas of the extremities and trunk wall present as painless, accidentally observed tumors, which do not influence function or general health despite the often large tumor volume. The seemingly innocent presentation and the rarity of soft tissue sarcomas often lead to misinterpretation as benign conditions. Superficial soft tissue lesions larger than 5 cm and all deep-seated (irrespective of size) tumors have a high risk (around 10 percent) of being a sarcoma. Such patients should ideally be referred to a specialized tumor center before surgery for optimal treatment

MATERIALS AND METHODS

The study was undertaken at Department of Pathology in collaboration with Department of Surgery, G.S.V.M. Medical College and L.L.R. Hospital, Kanpur over a 5 year period including 3 years retrospective (2014-16) study followed by 2 years prospective (2017-18) study.

METHOD OF DATA COLLECTION

Retrospective data was collected from the medical records section and old paraffin blocks were used to prepare slides for review. For the prospective phase of the study, samples were sent from the Department of General Surgery The tissue received was preserved in 10% formalin. In every case the standard protocol for surgical grossing of the specimens was followed. After a detailed macroscopic study and description noting the shape, size and weight, surface and consistency of the specimen, sections from the representative areas were taken and processed followed by paraffin embedding, thin sections were cut and stained with routine H & E stain.

RESULTS

Of total 17556 biopsies received in the 5 years of study 510 were found to be soft tissue tumors which constitute about 2.9% of total specimen received. During the period of study 1752 malignancies were reported out of which 78 were found to be malignant soft tissue tumors. This constitutes about 4.4% of total malignancies reported in this period.

Table 1 – Distribution Of Benign, Intermediate And Malignant STTs

S.NO.	Nature of Tumors	No.	Percentage (%)
1.	Benign	408	80%
2.	Intermediate	24	4.7%
3.	Malignant	78	15.3%

Table 2 – Year-wise Distribution Of Cases From Year 2014 To Year 2018

S. NO.	Period of study (year wise)	No. of cases			
		Benign	Intermediate	Malignant	Total
1.	2014	85	5	16	106
2.	2015	80	3	12	95
3.	2016	85	5	14	104
4.	2017	80	7	28	115
5.	2018	78	4	8	90

Table 3 – Age And Sex Distribution Of Soft Tissue Tumors.

Age group (in year)	Male	Female	Total cases	%age
1-10	21	14	35	6.9
11-20	24	16	40	7.8
21-30	74	49	123	24.1
31-40	70	40	110	21.6
51-60	23	22	45	8.8
61-70	30	14	44	8.5
71-80	7	0	7	1.4
81-90	3	1	4	0.8
>90	-	-	-	-
Total	313	197	510	100

Table 4 – Distribution Of Tumours According To Sex

S. NO.	Sex	Nature of tumor					
		Benign	%age	Intermediate	%age	Malignant	%age
1.	Male	249	61	16	66.6	48	61.5
2.	Female	159	39	8	33.3	30	38.5

Table 5 – Age-wise Distribution Of Tumours

S. No.	Age (in years)	Nature of tumor					
		Benign	Percentage	Intermediate	Percentage	Malignant	Percentage
1.	1-10	27	66	02	8.3	06	7.7
2.	11-20	32	7.8	03	12.5	5	6.4
3.	21-30	100	24.5	6	25	17	21.8
4.	31-40	85	20.8	4	16.7	21	26.9
5.	51-60	82	20.1	5	20.8	15	19.2
6.	61-70	39	9.6	1	4.32	5	6.4
7.	71-80	36	8.8	2	8.3	6	7.7
8.	81-90	4	1	1	4.2	2	2.6
9.	>90	0	0	0	0	0	0
	Total	408	100	24	100	78	100

Table 6 – Distribution Of Benign, Intermediate And Malignant STTs Based On Tumour Type

S. No.	Tumour type	Nature of tumor		
		Benign	Intermediate	Malignant
1.	Adipocytic tumors	200	0	9
2.	Fibroblastic/myofibroblitic	10	20	12
3.	So-called fibrohistocytic	20	4	0
4.	Smooth muscle tumors	0	0	0
5.	Pericytic (Perivascular) tumors	4	0	0
6.	Skeletal muscle tumors	0	0	5
7.	Vascular tumors	142	0	9
8.	Nerve sheath tumors	25	0	16
9.	Tumors of uncertain differentiation	7	0	16
10.	Undifferentiated/unclassified sarcomas	0	0	14

Table 7(a) – Pathological Sub Type Division Of Benign STN Neoplasm

S. No.	Histological types of STTs	Benign STTs	
		No. of cases	Percentage
1.	**Adipocytic tumour (n=200)**		
	(a) Lipoma	115	28.2
	(b) Lipomatoses	21	5.2
	(c) Angiolipoma	25	6.1
	(d) Spindle cell/pleomorphic lipoma	28	6.9
	(e) Hibernoma	11	2.7
2.	**Fibroblastic/myofibroblastic**		
	(a) Fibroma of tendon sheath	10	2.4
3.	**So-called fibrohistiocytic**		
	(a) Tenosynovial giant cell tumors	8	2.0
	(b) Deep benign fibrous histiocytoma	12	2.9
4.	**Pericytic/perivascular (n=4)**		
	(a) Myopericytoma	2	0.5
	(b) Myofibroma	2	0.5
5.	**Vascular tumours (n=142)**		
	(a) Hemangioma		
	I. Synovial	30	7.4
	II. Venous	100	24.5
	III. Arteriovenous	12	2.9
6-	**Nerve sheath tumour(n=25)**		
	(a) Schwannoma	16	3.9
	(b) Neurofibroma	6	1.5
	(c)Plexiform neurofibroma	3	0.7
7.	**Tumours of uncertain differentiation (n=7)**	7	1.7
	(a) Deep angiomyxoma		

Table 7(b) – Histopathological Sub-type Division Of Intermediate STNs

S. No.	Histological types of STTs	Intermediate STTs	
		No. of cases	Percentage
1.	Fibroblastic/myofibroblastic (n=20)		
	(a) Dermatofibrosarcoma protuberance	15	62.5
	(b) Low grade myofibroblastic sarcoma	5	20.8
2.	So-called fibrohistiocytic (n=4)		
	(a) Plexiform fibrohistocytic	4	16.7

Table 7(c) – Histopathological Sub-type Division Of Malignant STNs

S. No.	Histological types of STTs	Malignant STTs	
		No. of cases	Percentage
1.	Adipocytic tumour (n=9)		
	(a) Dedifferentiated liposarcoma	5	6.4
	(b) Myxoid liposarcoma	4	5.1
2.	Fibroblastic/myofibroblastic (n+12)		
	(a) Adult fibrosarcoma	4	5.1
	(b) Myofibrosarcoma	2	2.6
	(c) Low grade fibromyxoid sarcoma	6	7.7
3.	Skeletal muscle tumour (n=5)		
	(a) Alveolar rhabdomyosarcoma	5	6.4
4.	Vascular tumour (n=9)		
	(a) Epithelial hemangioendothelioma	9	11.5
5.	Nerve sheath tumour (n=13)		
	(a) Malignant peripheral NST	13	16.7
6-	Tumours of uncertain differentiation (n=16)		
	(a) Synovial sarcoma/spindle cell	4	5.1
	(b) Epithelialoid sarcoma	8	10.3
	(c) Extraskeletal myxoid chondrosarcoma	4	5.1
7.	Undifferentiated/unclassified sarcoma (n=14)		
	(a) Undifferentiated Pleomorphic sarcoma	14	18

Table 8 – Distribution Of STTs According To Anatomical Site

S. No.	Sites of tumour	Benign STTs		Intermediate STTs		Malignant STTs	
		No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
1.	Head & Neck	14	3.4	2	8.3	15	19.2

2.	Upper limb	86	21.1	6	25	15	19.2
3.	Lower limb	150	36.8	4	16.7	20	25.6
4.	Chest & Abdomen	78	19.1	10	41.7	13	16.7
5.	Pelvis & retroperitoneum	30	7.3	0	0	8	10.3
6.	Back	50	12.3	2	8.3	7	9
	Total	408	100	24	100	78	100

DISCUSSION

In our study duration of five years soft tissue tumors formed 2.9% of the total specimen load with a total of 510 cases. Most cases belonged to age group of 21-30 years, followed by 41-50 years age group. Malignant soft tissue tumors/sarcomas were most common in elderly patients belonging to 31-40 years age group. Male to female ratio was 1.6:1. These results are in concordance with the results obtained by Natekar et al, Jain P et al, Umarani MK et al 12 and Swagata D et al.

The extremities were found to be the most frequent location accounting for 55% of all soft tissue tumors. Maximum percentage of cases of benign soft tissue tumors were localized to lower extremity (36.8%), followed by upper extremity (21.1%). Intermediate soft tissue tumors were most common in the upper extremity (25%) and lower extremity (16.7%). Malignant soft tissue tumors were most common in lower extremity (25.6%), followed by upper extremity (19.2%), which is comparable with the study of Jain et al, Umarani MK et al and Swami BD et al.

In our study 80% of soft tissue tumors were benign .There were 78 cases (15.4%) of malignant tumors. These results were also similar to previous studies done by Anitha S et al, Jain P et al, Myhre Jensen et al, and M.J. Kransdorf et al.

Adipocytic tumors constituted 49% of all benign soft tissue tumors with lipomas accounting for 28.2% of all benign soft tissue tumors. Vascular tumors (34.8%) formed next largest group, followed by nerve sheath tumors (6.1%). Most of the benign tumors were located in the extremities (57.9%) and were common in males (61%). These results correlate with that of Anitha S et al and Narayanan NO et al.

Malignant soft tissue tumors were rare constituting 15.3% of all soft tissue tumors. Majority (26.9%) of malignant tumors were seen in age group 31-40 years. 25.6% of these tumors were located in lower extremities. Head and neck and upper extremity (19.2% each) seem to be the next preferred location. This predilection is also confirmed by the studies of Mandong et al. However, studies done by Samartha V et al, Jain P et al and Narayanan NO et al reported extremities as the most common site followed by the trunk and abdomen.

CONCLUSION

In a 5 year span (2014 – 2018). Soft tissue tumors constituted 2.9% of total specimen received during the study period. Out of total 510 cases, 408 were benign (80%), 24 intermediate (4.7%) and 78 malignant (15.3%). The benign to malignant ratio was 5.2:1. There is male preponderance in benign, intermediate and malignant categories with male to female ratio in benign group as 1.5:1, in intermediate as 2:1 and in malignant group as 1.6:1. Overall male to female ratio was 1.6:1. Age of the patients presented with soft tissue tumors ranged from 5 years to 86 years and 123 out of 510 (24.1%) belonged to the age group 21-30, followed by 110 (21.6%) in the age group 31-40. In benign group adipocytic tumors accounts for nearly half of total reported benign cases (49%), followed by vascular tumors (34.8%). Lipoma was found to be the commonest type (28.2%) among the benign soft tissue tumors. In intermediate group fibroblastic/myofibroblastic constituted 83.3%, followed by so-called fibrohistiocytic tumors (16.7%). Most common intermediate tumor was dermatofibrosarcoma protuberance (62.5%), followed by low grade myofibroblastic sarcoma (20.8%). In malignant group tumor of uncertain differentiation ranged highest (20.5%) followed by undifferentiated/unclassified sarcomas (18%) and nerve sheath tumors (16.7%). Most common malignant tumor was undifferentiated pleomorphic sarcoma (18%) followed by malignant peripheral nerve sheath tumor (16.7%) and epithelioid hemangioendothelioma (11.5%). Extremities are observed to be the commonest anatomic site in overall soft tissue tumors accounting for 174 cases presenting in lower extremity and 107 cases presenting in upper extremity out of total 510 cases studied. Anatomical distribution of benign soft tissue tumor indicate majority cases localized to lower extremity (36.8%), followed by upper extremity (21.1%). Least were reported in head and neck region (3.4%). Intermediate soft tissue tumors were most commonly localized to chest and abdomen (41.7%), followed by upper extremity 25% and lower extremity 16.7%. Anatomical distribution of malignant soft tissue tumor indicate maximum number of cases attributed to lower extremity (25.6%), followed by 19.2 % each in head and neck and upper extremity. Least cases have been observed in back region (9%).

REFERENCES

1. Ashwini Natekar, Shubasis Basu, Gavruv Gupta, Maruti Pujari. Spectrum of bone and soft tissue tumors in a tertiary cancer institute in Eastern India. IJRMS, ISSN: 2320-6012.
2. Pramila Jain, Archana Shrivastava, Reeni Malik. Clinicomorphological Assessment of Soft Tissue Tumors. Scholars Journal of Applied Medical Sciences (SJAMS), 2014; 2(2D):886-890.
3. Umarani M.K, Prima Shuchita Lakra, Bharathi M. Histopathological Spectrum of Soft Tissue Tumors in a Teaching Hospital, , IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 4 Ver. X (Apr. 2015).
4. Swagata D, Gobil T, Projnan S. Spectrum of soft tissue tumours at a tertiary care centre in North East India. Indian J Basic Appl Medl Res.2016;5(4):303–306.
5. Swami BD, Swami SY, Narhire VV, Dhamecha MP, Costa GD. A clinicopathologic study of soft tissue neoplasms: An experience from a rural tertiary care hospital. Ann Trop Med Public Health. 2017;10:348–352.
6. Anitha S, Kanya Kumari M. Spectrum of soft tissue tumors based on histomorphology. MedPulse International Journal of Pathology, Volume 3, Issue 1 July 2017.
7. Myhre-Jensen O.A consecutive 7-year series of 1331 benign soft tissue tumours. Clinicopathologic data. Comparison with sarcomas. Acta Orthop Scand 1981; 52(3): 287-93.
8. Kransdorf MJ. Benign soft-tissue tumours in a large referral population: distribution of specific diagnoses by age, sex, and location. AJR Am J Roentgenol 1995; 164(2): 395-402.
9. Kransdorf MJ.Malignant soft tissue tumours in a large referral population: Distribution of specific diagnosis by age, sex and location. AJR Am J Roentgenol 1995; 164(1): 129-34.
10. Narayanan NO, Sapna M, Sumangala B. Spectrum of soft tissue tumors in a tertiary care centre - A 5 year study. Natl J Med Dent Res. 2016;4(2):83–88.
11. Mandong BM, Kidmas AT, Manasseh AN, Echejoh GO, Tanko, Madaki A.Epidemiology of soft tissue sarcomas in Jos, North Central Nigeria. Niger J Med 2007; 16(3): 246-9.
12. Samartha V, Hegde S, Ahmed Z, Umaru N. Histopathological Study of Malignant Soft Tissue Tumours. J Evol Med Dent Sci. 2015;4:3320–3328.