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Original Research Article

A clinico pathological evaluation of soft tissue tumors in tertiary care centre

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ABSTRACT

Introduction: Soft tissue tumors are variegated and heterogeneous collection of tumors. Diagnosis and proper management is essential of these tumors. In our study we recorded detailed clinical history with examination of patients from records including age, sex, site of tumor. Also record different microscopic patterns and incidence of soft tissue tumors.
Materials and Methods: Total 360 cases we analyzed in June 2008 to June 2012 in our tertiary care centre. We used some special stains & immunohistochemical markers in doubtful case where ever possible.
Results: There are total 360 (9.9%) soft tissue tumors obtained from all tumors received, 330(91.7%) were benign and 30 (8.3%) were malignant. Highest prevalence of benign tumors had in 21 to 30 years of age and of malignant in 41 to 50 years. Lipoma is most common tumor in benign (52.4%), while liposarcoma (33.3%) of malignant tumors. Males (55.8%) having high incidence in benign as well as malignant tumors than females (44.2%). Extremities are commonest location for both benign and malignant followed by head and neck. Immunohistochemistry is done in 15 cases only to confirm the diagnosis.
Conclusions: The clinicomorphological evaluation of soft tissue tumors is gold standard in present days also for diagnosis and management especially in the institute where the new techniques like IHC & molecular pathology are not available. But the immunohistochemistry is needed for proper diagnosis, further management of patients and correct classification of tumors.

1. Introduction

In 1782 Wardrab coined the term “soft tissue”

Soft tissue is nothing but a nonepithelial extra skeletal tissue of the body without reticuloendothelial system, glia, and supporting tissue of various parenchymal organs. It includes smooth muscles, striated muscles, fat and fibrous tissue, with vessels. It also includes peripheral nervous system because tumors from nerves present as soft tissues masses. Soft tissue is derived embryologically from mesoderm with some contribution from neuroectoderm.[1]

Benign soft tissue tumors 10 times more common than malignant one. Soft tissue sarcomas compared with carcinomas and other neoplasm, are relatively rare and less than 1% of all malignant tumors.[1] They occur in any part of body, most commonly in extrimitis, trunk, abdomen and head and neck.[2]

Soft tissue tumor and tumor like lesions have very wide variety and c lose histopathologic findings between certain tumors with little difference detect at close examination under microscope, so it appeal to give diagnostic challenge to histopathologist. For e.g. ‘nodular fasciitis ’or‘ atypical lipoma’ which is being misdiagnosed as fibrosarcoma or pleomorphic liposarcoma respectively.

Light Microscopic evaluation of hematoxylin-eosin stained section is still the standard technique for the diagnosis of these tumor malignancies.[3] Grading of malignant tumors is the most established criteria for

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predicting the biological behaviour of these tumors which is not essential to give proper therapy,[4] but it is confirmed by immunohistochemistry, cytogenetics and electron microscopy for the precise role diagnosis.[5] Special stains in soft tissue pathology plays variable role or inconclusive or to justify the light microscopic diagnosis.[6] This variability, diversity and uniqueness of these tumors produce interest of undertaking a study on soft tissue tumors.

2. Materials and Methods

Four years of study (two years retrospective and two tears prospective) was done from June 2008 to June 2012 in tertiary care hospital. Total 360 Soft tissue tumors were obtained in these four years. We record parameter like age, sex, and anatomical location of tumor from clinical record and history. All these tumors we categorized under extremities, trunk-abdomen and head and neck region.

Gross examination done in detailed with tumor size, consistency, presence of necrosis, haemorrhage, calcification, status of capsule, surgical margin of resection and invasion or adhesion of tumor to the adjacent structures.

Several sections were taken and stained with haematoxylin and eosin. Detailed microscopic analysis was done including type of tumor cell, arrangement, and pleomorphism. Also examined for necrosis, mitosis, lymphovascular embolism, haemorrhages. Special stains like orcein, reticulin, PAS, Masson's trichrome and PTAH were conducted wherever necessary.[7]

Immunohistochemistry was done in 15 cases. Markers used are vimentin, cytokeratin, desmin, neurofilament protein, EMA, Myoglobin, CD31, CD34, BCL2, S100 and SMA. The tumors were classified according to WHO classification.[8]

We include benign and malignant soft tissue tumors of various parts of body, except uterine and gastrointestinal soft tissue. Tumor like lesion also excluded.

A chi-square test was used, which showed that these results were statistically significant.

3. Results

From entire surgical material (18134 cases) soft tissue tumors was 1.9%(360 cases) in 4 years duration.[Graph 1]

Soft tissue tumors represented 9.9% (360 cases) of all tumors (3650 cases) received during these four years study. [Graph 2]

91.7%(330 cases) formed bulk of benign soft tissue tumors while 8.3%(30 cases) formed malignant one.

Ratio of benign to malignant soft tissue tumor is 11:1 in this study.[Graph 3]

The highest prevalence of benign soft tissue tumors was in third decade while malignant tumors had in fifth decade.[Table 1]

Soft tissue tumors had slightly male preponderance having male to female ratio was 1.3:1. Male to female ratio in benign tumors was 1.2:1 and among malignant tumors ratio was 2:1 [Table 2]

Extremities were the commonest location for both benign and malignant soft tissue tumors there after head and neck region was common. [Table 3]

The most common benign tumor in this study was lipoma (52.4%) form all benign tumors followed by vascular tumors (21.2%), peripheral nerve sheath tumors (20.9%), fibrous tumors (3.3%), fibrohistiocytic tumors (1.8%) smooth muscle tumors and tumors of uncertain differentiation(0.3%) in descending order.[Table 4]

Among the malignant soft tissue tumors liposarcoma (33.3%) was commonest, followed by malignant peripheral nerve sheath tumors, angiosarcomas, rhabdomyosarcoma (13.3%). Leiomyosarcoma and malignant fibrous histiocytoma(10%), synovial sarcoma (6.6%) in descending order of frequency.[Table 4]

Special stains like PTAH, PAS, and reticulin were useful in some problematic cases as well as highlight some structures for learning purpose.

In present study 30 malignant tumors were graded according to FNCLCC grading system as follows-

Grade I: 13

Grade II: 10

Grade III: 07

Immunohistochemistry for tissue-related marker has proved of great value & is now widely used for accurate classification of these neoplasms.

We did IHC on 15 cases. In 10 cases the histopathological diagnosis was confirmed on IHC. 3 cases we diagnosed as high grade sarcoma which were we further classified them on the basis of IHC findings. 2 cases had difference in light microscopic and IHC findings.

4. Discussion

Soft tissue tumors are very rarely obtained samples in histopathology department. In our study we received 360 soft tissue tumors; we recorded clinical data which includes age, sex, and location of tumor. Along with also record the incidence and different microscopic pattern of soft tissue tumors. We have compared our results with similar studies in India and abroad. Thus data available for comparison is from different geographic areas and of different time periods. Collective studies of all types of soft tissue tumors are very few as compared to individual soft tissue tumor.

In our study soft tissue tumors accounted 9.9% of all tumors from which 9.04% are benign tumors and 0.82% constituted by malignant tumors.

Total 360 soft tissue tumors are studied, 330 are benign while 30 are malignant in present study constituting 91.7% and 8.3% respectively. Benign to malignant ratio is 11:1 in our study, which is comparable to study done by Myher

Jensen et al[9] 1981 who reported ratio 18:1. M.J. Kransdorf et al[10,11] in 1995 reported ratio 1.5:1, Lazim et al[12] in 2008 reported as 5.1:1, Bashar et al[2] in 2010,and Beg et al[13] in 2012 also reported a benign to malignant ratio as 3:1,and 5:1 respectively. These studies also comparable with our study. [Table 5].

Soft tissue tumors found more often in male than female, ratio is 1.3:1 in present study, which is similar to Myher Jensen et al[9] 1981, M J Kransdorf et al[10,11] 1995, Beg et al[13] in 2012 reported an incidence as 1:1,1.2:1, and 1.8:1 respectively. [Table 6]

In present study age ranged from 2 months to 72 years and 35.5 years is the average age of benign tumors which is comparable with studies done by Myher Jensen et al[9] 1981, Bashar et al[2] in 2010 and Agravat et al[14] 2010 reported average age 44.5, 27.6, and 26.6 respectively. The average age of malignant tumors is 47.7 years which is similar to studies done by Myher Jensen et al[9] 1981, Bashar et al[2] in 2010, Agravat et al[14] 2010, Lazim et al[12] in 2008, and Peterson et al[15] 2011 reported average age 49.5,39.1,64,30.5, and 63 years respectively.[Table 7]

In our study commonest site of benign tumors is an extremity (33%) mainly lower extremities, followed by head and neck region (32.1%), which is comparable with Beg et al in 2012 stud y showing common location of benign tumors in extremities (40.9%) then head and neck (35.5%).[13] M.J. Kransdorf et al 1995 also reported the same site incidence as 60.6% in extrimities, 13.8% in head and neck.[10,11]

In present study malignant tumors frequently observed in extremities (60%), mainly lower extremities which is followed by trunk and abdomen (23.3%) which is similar to M.J. Kransdorf study.[10,11] Also comparable with Lazim et al[12] in 2008, Zhi-wei et al,[16] Beg et al.[13]

Lipoma (52.4%) is the commonest benign tumor found, followed by hemangioma (21.2%) and schwannoma (20.9%) which is comparable to Myher Jensen et al[9] 1981 and M.J. Kransdorf study[10,11] 1995.

The commonest malignant soft tissue tumor is liposarcoma (33.3%), followed by malignant peripheral nerve sheath tumors, angiosarcoma, rhabdomyosarcoma (13.3%), leiomyosarcoma and malignant fibrous histiocytoma (10%), synovial sarcoma (6.6%) in descending order of frequency which is similar to M.J. Kransdorf study[10,11] 1995.

5. Conclusion

Soft tissue sarcomas occursrarely, presented as painless mass, so it should be diagnosed quickly for the sake of better management and good prognosis of patients. Diagnosis and management is a team work of clinicians and pathologist.

Careful gross examination with appropriate sampling of soft tissue tumor is essential. New advance techniques like special stains, immunohistochemistry, and molecular studies are useful in addition to routein light microscopic

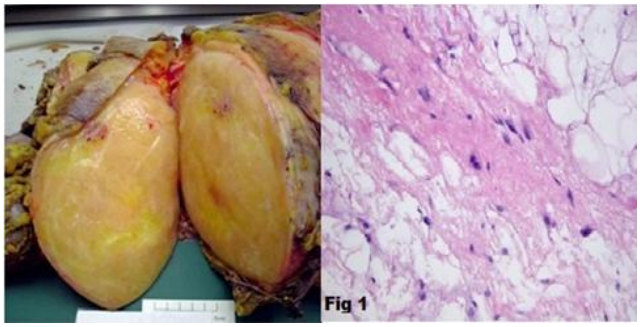


Fig. 1: Well differentiated liposarcoma- Thickened fibrous septa that display large hyperchromatic cells (H& E, X400) with gross finding

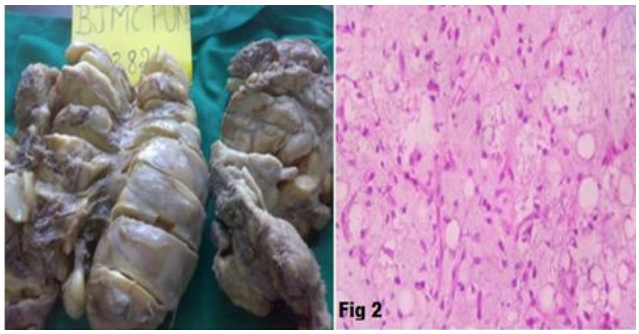


Fig. 2: Myxoid liposarcoma – mixture of uniform round to oval cells with signet ring lipoblasts in prominent myxoid stroma along with "chicken wire" capillary vasculature (H & E, X400) with gross finding.

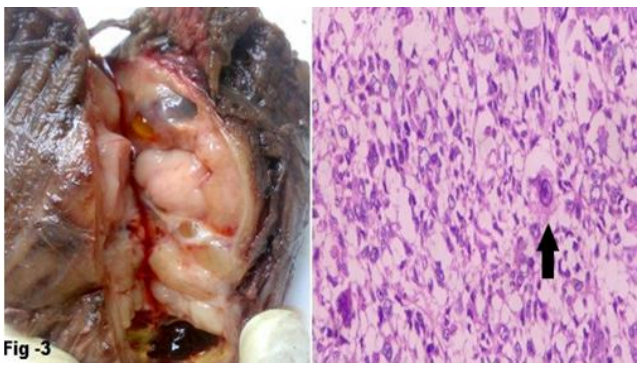


Fig. 3: Pleomorphic liposarcoma showing pleomorphic spindle cells with pleomorphic multivacuolated lipoblasts with bizarre hyperchromatic and scalloped nuclei. (Arrow showing pleomorphic lipoblast) (H & E, X400) with gross finding.

Table 1: Age & sex incidence in soft tissue tumors

Age in yrs	Sex		Total
	Male	Female	
0-10	11	16	27
11-20	31	23	54
21-30	44	32	76
31-40	34	35	69
41-50	33	24	57
51-60	25	15	40
>61	23	14	37
Total	201	149	360

Table 2: Sex Incidence of all SSTS

Tumours	Sex				Total	%
	Male	%	Female	%		
Adipocytic	98	27.2	85	23.6	183	50.8
Fibrous	07	1.9	03	0.8	010	2.7
Fibrohistiocytic	05	1.4	04	1.1	009	2.5
Smooth muscle	03	0.8	01	0.3	004	1.1
Skeletal muscle	03	0.8	01	0.3	004	1.1
Blood vessels	43	12	31	8.6	074	20.5
Peripheral nerve sheath tumours	40	11.1	33	9.2	073	20.3
Tumours of uncertain differentiation	02	0.5	01	0.3	003	0.8
Total	201	55.8	159	44.2	360	100

Chi-square = 2.72, P>0.05

Table 3: Site distribution of Benign and Malignant soft tissue tumors

S. no	Site	Benign	Malignant	Total
1	Extremities	109	18	127
2	Head and Neck	106	04	110
3	Back and Shoulder	76	01	77
4	Trunk and Abdomen	35	07	42
5	Others	04	00	04
6	Total	330	30	360

Table 4: Incidence of benign and malignant soft tissue tumors

Type	Category of Soft tissue Tumours		Total (%)
	Benign (%)	Malignant (%)	
Adipocytic	173(48)	10(2.8)	183(50.8)
Fibrous	10(2.8)	0	10(2.8)
Fibrohistiocytic	6(1.7)	3(0.8)	9(2.5)
Smooth muscle	1(0.3)	3(0.8)	4(1.1)
Skeletal muscle	0	4(1.1)	4(1.1)
Blood vessels	70(19.4)	4(1.1)	74(20.5)
Peripheral nerve sheath tumours	69(19.2)	4(1.1)	73(20.3)
Tumours of uncertain differentiation	1(0.3)	2(0.5)	3(0.8)
Total	330(91.7)	30(8.3)	360(100)

Chi-square = 92.49, P<0.0001

Table 5: Comparative analysis of incidence of benign and malignant soft tissue tumors

Authors	No of tumours	Benign (%)	Malignant (%)	B:M
Myher Jensen (1981)	1403	1331(94.6)	72(5.4)	18.5:1
M.J.Kransdorf (1995)	31047	18677(60.2)	12370(39.8)	1.5:1
Lazim et al (2008)	213	178(83.6)	35(16.4)	5.1:1
Bashar et al (2010)	93	70(75.2)	23(24.8)	3:1
Beg et al (2012)	126	105(83.3)	21(16.7)	5:1
Present study	360	330(91.7)	30(8.3)	11:1

Table 6: Comparative analysis of sex ratio of all soft tissue tumors

Authors	No of tumours	Male (%)	Female (%)	M:F
Myher Jensen (1981)	1403	678(48.3%)	725(51.7%)	1:1
M.J.Kransdorf (1995)	300338	16727(55.1)	13611(44.9%)	1.2:1
Beg(2012)	126	81(64.3%)	45(35.7%)	1.8:1
Present study	360	201(55.8%)	159(44.2%)	1.3:1

Table 7: Comparative analysis of age incidence of benign and malignant soft tissue tumors

Authors	Ave Age Benign(yrs)	Ave Age Malignant (yrs)
Myher Jensen(1981)	44.5yrs	49.5yrs
Bashar et al (2010)	27.6yrs	39.1yrs
Agravat et al (2010)	26yrs	64yrs
Present study	35.5yrs	47.7yrs
Lazim et al (2008)	-	30.5ys
Peterson et al 2011)	-	63yrs

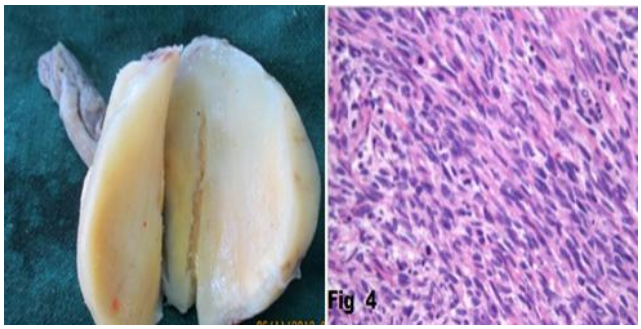


Fig. 4: MPNST- Tightly packed spindle cells arranged in fascicles with elongated nuclei with eosinophilic cytoplasm and brisk mitotic activity (H & E, X400) with gross finding

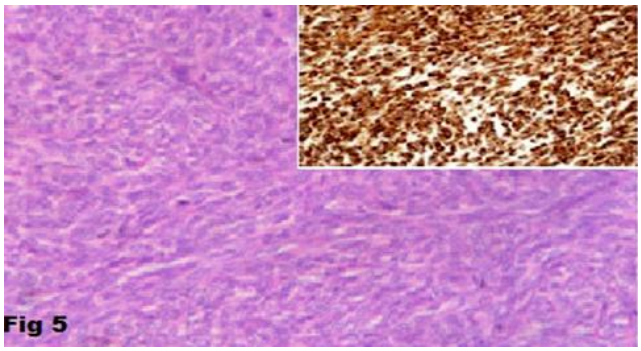
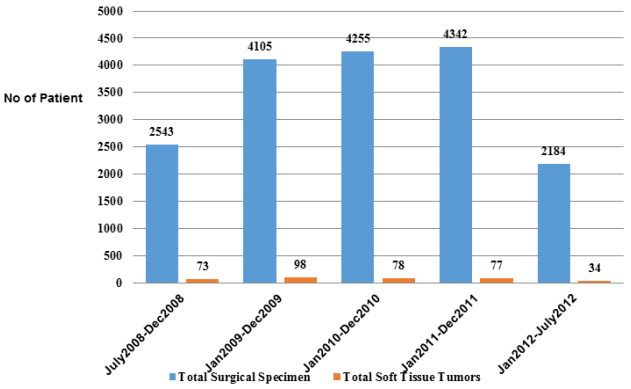
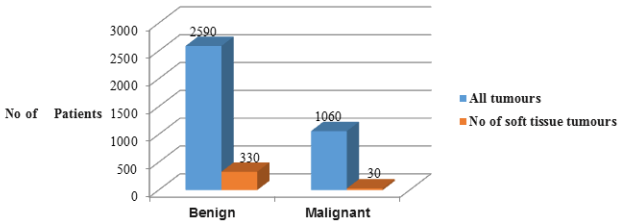


Fig. 5: Synovial sarcoma (monophasic pattern) with diffuse positivity for bcl2 (In Inset) (H & E, X400, IHC, X400)



Graph 1: Yearly distribution of Surgical pathology specimen



Graph 2: Incidence of benign & malignant tumours

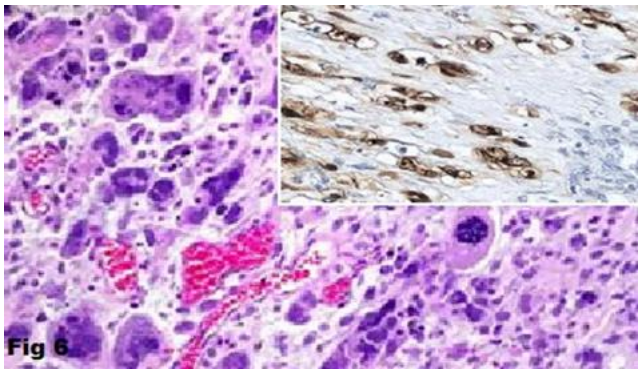
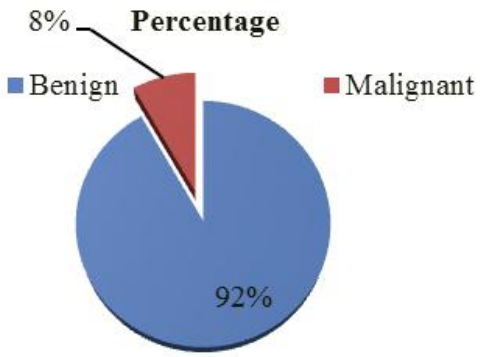


Fig. 6: Pleomorphic rhabdomyosarcoma (high grade) with myoglobin positivity (In inset) (H & E, X400, IHC, X400)



Graph 3: Relative incidence of benign & malignant soft tissue tumour

findings for exact diagnosis. But higher cost of these tests is the main limitation.

Clinicopathological correlation is still the gold standard for correct diagnosis of soft tissue tumors in the centres where the advance techniques are not available.

6. Financial support and sponsorship

None

7. Conflicts of interest

None.

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