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Morphological study of soft tissue tumors

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Abstract:

Soft tissue is a non epithelial extra skeletal tissue of the body, 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 originate (muscles, fat, fibrous tissue and nerves) . A five years (January 2010 – December 2014) retrospective study of soft tissue tumors was done at Santhiram Medical College, Nandyal, Kurnool. The present study comprises of all soft tissue tumors both benign and malignant tumors obtained during the five years. The tissues were fixed in 10% formalin, processed and sections were stained by hematoxylin and eosin. The clinco pathological correlation was done and the histomorphological diagnosis was made. The total 210 soft tissue tumors were analysed on the available clinical data from the hospital records. Among the 210 soft tissue tumours, 193(92%) cases were benign soft tissue tumors and 9(4.2%) were malignant. The benign to malignant ratio was 21:1. The benign tumors were 1.2:1 ratio and tumors had prelidiction for extremities and head and neck . The malignant tumor had slightly male predominance with male to female ratio of 2:1. The tumors were classified according to WHO classification with available modern diagnostic methods, wherever required . The clinico pathological evaluation is still the gold standard for the diagnosis of the soft tissue tumors.

Key words: Soft tissue tumors, clinico pathological, adipose tissue

Introduction:

Soft tissue tumors are defined as mesenchymal proliferation, that occur in extra skeletal , non epithelial tissue of the body, excluding glia and lymphoreticular system [1]. The pathogenesis of most of the soft tissue tumors is still unknown. The recognized causes include various chemical and physical factors, ionizing radiation, inherited or acquired immunological defects. Evaluation of the exact cause is difficult because of the latent period. These tumors can occur at any age. The histological distributions of these tumors are specific for a particular age group at a particular anatomical site [2].

The soft tissue tumors usually presents as a painless mass. Fine needle aspiration cytology has a role in the diagnosis of soft tissue tumors.

CT guided aspiration is suggested for intra abdominal and retroperitoneal mass [1,3]. FNAC is traumatic and is very useful to find the local recurrences of metastasis in a previously diagnosed soft tissue [4]. A soft tissue mass more than 6 weeks with or without history of trauma and even persisting after local trauma, biopsy is indicated. Many types of biopsy are indicated for the diagnosis of the soft tissue masses. A core biopsy, an excisional, incisional biopsy are the appropriate techniques used. Among these the open biopsy has been considered the gold standard for the diagnosis of extremity soft tissue mass [1,5].

Soft tissue tumors and tumor like lesions have facinated 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.

Soft tissue tumors arise everywhere in the body, the most important location being the extremities, trunk, abdominal cavity and head and neck region [6].

The accurate diagnosis is possible by detail clinical history, physical examination and gross examination of the tumors. The clinical details like age of the patient, location and size of the tumors help greatly in narrowing down the differential diagnosis [1].

The special techniques have been applied to increase the diagnostic accuracy. These include conventional special stains, electron microscopy, immunohistochemistry and cytogenetic molecular methods [1]. The WHO classification and standard nomenclature now offers a better clinico pathological correlation.

Aims

1. To study the frequency of age , sex and site distribution of the tumors.
2. To study the incidence of benign and malignant soft tissue tumors.
3. To study the clinico pathological correlation of soft tissue tumors.
4. To study the histopathological patterns for understanding the classification and type of soft tissue tumors.

Material and Methods:

The present study comprises of all the soft tissue tumors, both benign and malignant obtained at Santhiram Medical College and Hospital Nandyal, Kurnool. The retrospective study was undertaken for a period of 5 years ie from January 2010 to December 2014 . The clinical data including history, clinical features, ultrasound, radiological finding and gross findings was taken from the hospital records. The paraffin blocks were taken and recut and stained by H & E stain. The tissues were fixed in 10% formalin and processed. Sections were taken from paraffin embedded blocks and H& E staining was done. Special stains like PAS, Reticulin, PTAH were done where ever necessary. Microscopic examination of the sections were done and grading was done according.

Results:

The study was done for a period of 5 Years from January 2010 to December 2014. During this period the total 15,105 surgical specimen were received for histopathological examination, out of these 210 specimens were soft tissue tumors. Among 210 lesions, 193 (92%) were benign, 8 (3.8%), intermediate and 9 (4.2%) were malignant tumors . The benign to malignant ratio of 21:1.

The benign soft tissue tumors had a peak age incidence in the 4th decade and malignant tumors in the 6th decade. Both benign and malignant tumors had slightly male predominance with a male to female ratio of 1.2:1. The male to female ratio among the benign tumors was 1.3:1 and among the malignant tumors was 2:1.

The benign soft tumors and intermediate tumors had predilection for extremities and head and neck. The malignant tumors had predilection for lower extremities , trunk and abdomen.

Majority of the soft tissue tumors presented as a pain less mass of duration ranging from 3 month to 3years.

The adipose tissue tumors were the most common histological group .

The commonest benign tumors were lipoma (37.1%) followed by vascular tumors (26%) peripheral nerve sheath tumors (15.7%), fibrous tumors (11.5%), fibrous histiocytic tumors (4.7%), tumors of uncertain origin and undiffrentiated /unclassified tumors (each 1.4%) and gastro intestinal stromal tumors (0.9%).

Table 1: Incidence of soft tissue tumors

Type	Male	Female	Total
Benign	98(46.7%)	95(45.4%)	193(92%)
Intermediate	2(0.9%)	6(2.8%)	8(3.8%)
Malignant	6(2.8%)	3(1.4%)	9(4.2%)
Total	106(50.4%)	104(49.6)	210 (100%)

Table 2: Age and sex incidence of soft tissue tumors

Age	Male	Female	total
0-10	5	5	10
11-20	14	10	24
21-30	22	27	49
31-40	21	22	43
41-50	25	14	39
51-60	10	14	24
Above 60	9	12	21
Total	**106**	**104**	**210**

Table 3: Incidence of soft tissue tumors

Type	Benign		Intermediate		Malignant		total	percentage
	M	F	M	F	M	F		
Adipocytic	41	37	-	1	-	-	79	37.7%
Fibrous	8	9	2	5	-	-	24	11.5%
Fibrohistocytic	3	7	-	-	-	-	10	4.7%
Blood vessels/ Lymphatics	29	25	-	-	1	-	55	26.3%
Perivascular	-	1	-	-	-	-	1	0.4%
Peripheral nerve sheath tumors	17	16	-	-	-	-	33	15.7%
GIST	-	-	-	-	2	-	2	0.9%
Tumors of uncertain origin	-	-	-	-	2	1	3	1.4%
Undifferentiated/ Unclassified tumors	-	-	-	-	1	2	3	1.4%
	98	95	2	6	6	3	210	100%

Table 4: Site wise distribution

Sr.NO	SITE	BENIGN	Intermediate	Malignant	total
1	Extremities	84	4	6	94
2	Head & neck	63	2	0	65
3	Back & shoulder	18	0	1	19
4	Trunk & abdomen	20	2	2	24
5	others	8	0	0	8

Table 5: Comparision

Study	M:F	Benign	Intermediate	malignant
Makino(1979)	-	96%	-	4%
Myher Jensen (1981)	1:1	-	-	-
M.J Kransdorf (1995)	1.2:1	60.2%	-	39.8%
Agravatet(2010)	-	86%	2%	6% / 6% tumor like
Petersen etal(2011)	-	35%	11.4%	49% / 4.6% of uncertain potential
Beg	1.8:1			
Prameela jain (2014)	1.2:1	90.6%	-	9.4%
Present study	1:1	92%	3.8%	4.2%

Discussion:

Soft tissue is non epithelial extraskeletal tissue of the body exclusive of reticulo endothelial

systems, glial and supporting tissue of the various parenchymal organs. [1]. 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 tumors have no normal tissue counterpart but have consistent clinicopathologic features warranting their designation as distinct entities.

In the present study the benign tumors were (92%) , the intermediate tumors were 3.8% and the malignant were 4.2% which is in between the study of Myher Jensen etal [7], and Lazim et al [8] and Pramila jain et al [1], where as M.J. Kransdorf et al [2] reported 60.2% benign and 39.8% malignant soft tissue tumors in their study. Peterson et al [3] reported 49% malignant, 11.4% intermediate, 35% benign and 4.6% as tumors of uncertain potential , Pramila jain et al [1] reported 90.6% benign, 9.4% malignant, and 0.81% tumors of uncertain differentiation. The present study differed with Peterson et al and Pramila jain et al, as the incidence of benign were high, the malignant and tumors of uncertain differentiation with low frequency. Makino et al [9]stated that 96% as benign tumors, 4% as malignant. In all these studies benign tumors predominated over malignant tumors. The present study correlated with Makino et al as benign tumors were 92%.

The relative frequency of benign to malignant soft tissue tumors is difficult to estimate accurately since many of the benign tumors cannot cause much problems and patient do not report to the clinicians and also most benign lesions are not removed.

The analysis of soft tissue tumors was done according to age, sex distribution, site and clinical presentation etc. The analyses of the soft tissue tumors were done by many workers and specific sarcomas tend to appear in certain age groups.

Almost all soft tumors had a male predominance. In the present study there were 106 males and 104 female out of 210cases soft tissue tumors with male to female ratio 1.2:1%. Our study correlated with the study M.S.Kransdorf et al [2]. The present study also comparable with studies of Myhre Jensen etal [7] and Beg [3] where the M: F were 1:1 and 1.8:1 respectively. In the present study peak incidence noted in the age range of 21-30 years and in more than 60 years age. Lazim et al [8] in one year's study reported male predominance with M:F ratio of 1.7:1. Mandong et al 10 in ten years study of soft tissue tumors, reported male to female ratio 2:1. The above author study correlated with Abuduet al [11]. The present study correlated with pramila jain etal [1] and Abudu et al [11] and differed with Mondong et al [10].

In the present study of 210 cases of soft tissue tumors 91% were benign, 3.8% intermediate and 4.2% malignant Agravatet et al [12] in his study of 100cases reported 86% benign , 2% borderline, 6% each malignant and tumor like lesions. Pramila jain et al reported 90.60% benign, 9.40 % were malignant tumors. The present study correlated with the above authors.

Pramila jain et al reported that the adipocytic tumors (50.27%) were the most common soft tissue tumors followed by vascular tumors (20%) Myhre Jensen et al [7] reported that the common benign tumors were of adipocytic (48.%) . The present study correlated with Pramila jain et al and Myhre Jensen et al. There is a highly significant association between the type of tumors and the category of tumors. The benign adipocytic tumors accounted for (37.1%) followed by vascular tumors (26.1%) and tumors of uncertain differentiation (less than 2%) encountered. Similar findings documented by pramila jain et al [1].

Pramila jain etal [1] and Myhre Jensen 2015 reported that the most common benign soft tissue tumors were of adipocytic (50.27% and 48.1%). The present study correlated with the above study.

Myhre -Jensen etal [7] reported that the lipoma followed by benign histiocystic tumors (15.8%) where as in the present study adipocytic tumors followed by benign blood vessel tumors (26.1%).

In the present study majority of malignant soft tissue tumors were of undifferentiated/ uncertain origin (1.4% each) followed by gastro intestinal tumors (0.9%) and tumor of blood vessels.

Good number of studies documented that the extremities were the commonest site. Soft tissue tumors may arise in any location although approximately 40 % occur in lower extremities 1. In the present study benign soft tissue tumors were seen in extremities followed by head and neck. The study was comparable with Pramila jain et al [1] and Begetal [3]. Beg and zhi etal [3,13] stated that the commonest site was extremities for the malignant tumors mainly lower extremities followed by trunk and abdomen , where as Madong etal [10] reported that extremities followed by head and neck. The present study correlated with Beg and zhi etal [3,13] and differed with Madong et al [10].

Meis – kindblom et al [14] documented that the extremities was the most common site of angio

sarcoma. Kor etal [6] reported MPNST in extremities, as the most common site, followed by chest wall , trunk, Pelvis and head and neck. The present study correlated with above studies.

In the present study the malignant soft tissue tumors were observed to have a strong prelidiction for lower extremities followed by trunk and abdomen. he study correlated with pramila jain etal1 and kransdorf etal [2]. Weiss sw etal [15] noted extra skeletal myxoid chondro sarcoma and MFH most commonly in lower extremities then upper extremities.

The progrosis of sarcoma depends on accurate histologic classification. The diagnostic features are cell morphology, architectural arrangement. These histological features are not sufficient to distinguish one sarcoma from another, particularly with poorly differentiated aggressive tumors. Whatever the cell type, the grade of a soft tissue sarcoma is important in predicting its behavior. Grading is mainly based on the degree of differentiation, average number of mitosis per high power field, cellular pleomorphisim and extent of necrosis. In general tumors arising in superficial location have better progrosis than deep seated lesions.

Conclusion:

The soft tissue tumors are rare and usually presents as painless mass. The clinician must able to diagnose it early for better management. Careful gross examination of the specimen and adequate sampling of the tumor is essential. Routine haematoxylin and eosin stain followed by histochemical stain and immuno histochemistry are helpful for proper diagnosis. The clinico pathological correlation with latest (WHO) classification and standard nomenclature is essential for proper diagnosis of soft tissue tumors.

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