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Original Research Article

To Assess the Overall Incidence of Soft Tissue Tumours and to Investigate the Histomorphological Characteristics

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Abstract

Aim: The main objectives of the present prospective study are to determine the overall incidence of soft tissue tumours and their frequency of distribution in relation to age, sex and various sites in the body, and to study the histomorphological features which would help in classification and sub classification of soft tissue tumours. **Methods**: This retrospective study was carried out in the Department of Pathology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India, for 1 year. Total 100 patients of all the soft tissue tumors, both benign and malignant were included in this study. **Results**: Total 100 cases of soft tissue tumours were included in this study. It's slightly male preponderance with a male to female ratio was 1.5:1. Benign soft tissue tumours formed 85% of all soft tissue tumours while malignant soft tissue tumours constituted 15%. Malignant soft tissue tumours had a peak above 60 years age group .the male to female ratio among the benign soft tissue tumours was 1.57:1 and among the malignant soft tissue tumours was 1.14:1.On detailed histomorphological examination; the single most common histological group was the adipose tumours. The commonest benign tumour was Adipocytic (49%) of all benign tumours of soft tissue followed by vascular tumours (21%) peripheral nerve sheath tumours (19%), fibrous tumours (2%), fibro histiocytic tumours (3%) smooth muscle tumours (2%) and tumours of uncertain differentiation (1%) in the decreasing order to frequency. 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%) followed by vascular tumours (18%). Benign tumours of smooth muscle (1%) and tumours of uncertain differentiation are nil encountered. 37% benign soft tissue tumours were seen in extremities followed by head and neck 31% and for the malignant soft tissue tumours mainly lower extremities followed by trunk and abdomen. **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.

Keywords: soft tissue tumors, clinic pathological, adipose

Introduction

Soft tissue is a specialized form of tissue derived from the mesenchymal component of the embryo. It includes adipose tissue, fibrous tissue, skeletal muscles, blood vessels, lymphatic vessels and peripheral nervous system and is exclusive of skin, bone, lymphoreticular system, glia and soft tissues of various parenchymal organs.[1] Soft tissue tumors (STT) are categorized into benign, intermediate and malignant. Intermediate tumors are further subclassified into locally aggressive and rarely metastasizing tumors based on the biological behaviour.[2] Benign tumors closely resemble normal tissue on histology and have a limited capacity for autonomous growth. They exhibit little tendency to invade locally and are characterized by a low rate of local recurrence following conservative therapy. The incidence of benign STT is higher when compared to malignant tumors.[3] The annual clinical incidence (number of new patients presenting to clinician) of benign STT is 3000/million population, worldwide.[4] Soft tissue tumors are known to occur in any part of the body with a predilection for upper and lower extremities, trunk, retro peritoneum and head and neck. 2 Benign STT can occur at any site, both within and between muscles, ligaments, nerves, and blood vessels. Ninety-nine percent of benign tumors are superficial, and most of them measure less than 5 cm in size.[2,3]

Many risk factors such as genetic factors, environmental factors, irradiation, viral infections and immune deficiency have been found to be associated with malignant soft tissue tumours and some reports of certain soft tissue sarcomas arising at the site of surgical procedures or fracture sites and in the vicinity of plastic or metal prosthetic or implants as also due to thermal or acid burns after a latent period of several years are found in literature.[5] Depending on the biological behaviour, soft tissue tumours are classified into benign and malignant tumours, which arise nearly everywhere in the body. Benign tumours, which closely resemble normal tissues from which they arise, have limited capacity for autonomous growth. Benign soft tissue tumours are usually slow growing, superficial, well-defined, well encapsulated, painless and any soft tissue tumour is considered malignant if they increase in size with size>5cm, are deep to deep fascia and painful.[6,7] The mainstay of diagnosis of soft tissue tumour depends on the use of characteristic diagnostic techniques employed in diagnosis of soft tissue tumours with various sampling techniques being excisional, incisional and core biopsy with preferred technique for diagnosing the soft tissue masses over the extremities persistently remaining open biopsy which is considered as gold standard.[8-10] Fine needle aspiration cytology (FNAC) plays an important role in diagnosing the soft tissue lesions and CT-guided FNAC can be of particular help in diagnosis of intraabdominal and retroperitoneal lesions.[11] Biopsy of soft tissue tumours, particularly of suspicious malignant soft tissue lesion, is quintessential part of preoperative investigations, which helps in diagnosing the biological behaviour and outcome of tumours including poorly differentiated high grade tumours, which is complimented by latest diagnostic techniques such as immunohistochemistry, cytogenetic and molecular methods. This has led to a more logical histogenetic classification and standard nomenclature which has enhanced better chances of clinico-pathological correlation.[12]

Material and methods

This retrospective study was carried out in the Department of Pathology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India, for 1 year, after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

Total 100 patients of all the soft tissue tumors, both benign and malignant were included in this study. 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.

Results

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

Type	No. of soft tissue tumours	Percentage
Benign	85	85%
Malignant	18	15%
Total	100	100%

Table 2: Age & Sex incidence in soft tissue tumours

Age in yrs	Sex		Total
	Male	Female	
Below 10	4	5	9
10-20	9	6	15
20-30	6	3	9
30-40	8	2	10
40-50	9	7	16
50-60	10	8	18
above 61	14	9	23
Total	60	40	100

Table 3: Sex Incidence of All SSTS

Category	Sex		Total
	Male (%)	Female (%)	
Benign	52(52%)	33 (33%)	85
Malignant	8(8%)	7(7%)	15
Total	60 (60%)	40 (40%)	100

Table 4: Incidence of Benign & Malignant Soft Tissue Tumors

Type	Category of Soft tissue tumors		Total (%)
	Benign (%)	Malignant (%)	
Adipocytic	47 (47%)	2 (2%)	49(49%)
Fibrous	2 (2%)	0	2 (2%)
Fibro histiocytic	1 (1%)	2 (2%)	3 (3%)
Smooth Muscle	1 (1%)	1(1%)	2 (2%)
Skeletal Muscle	0	3 (3%)	3 (3%)
Blood Vessels	18 (18%)	3(3%)	21 (21%)
Peripheral nerve sheath tumors	16 (16%)	3(3%)	19 (19%)
Tumors of uncertain differentiation	0	1(1%)	1(1%)
Total	85 (85%)	15(15%)	100 (100%)

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

Site	Benign	Malignant	Total
Extremities	31	6	37
Head and Neck	27	4	31
Back and Shoulder	17	2	19
Trunk and Abdomen	8	3	11
Others	02	00	2
Total	85	15	100

Total 100 cases of soft tissue tumours were include in this study. It's slightly male preponderance with a male to female ratio was 1.5:1. Benign soft tissue tumours formed 85% of all soft tissue tumours while malignant soft tissue tumours constituted 15%. Malignant soft tissue tumours had a peak above 60 years age group .the male to female ratio among the benign soft tissue tumours was 1.57:1 and among the malignant soft tissue tumours was 1.14:1.On detailed histomorphological examination; the single most common histological group was the adipose tumours. The commonest benign tumour was Adipocytic (49%) of all benign tumours of soft tissue followed by vascular tumours (21%) peripheral nerve sheath tumours (19%), fibrous tumours (2%), fibro histiocytic tumours (3%) smooth muscle tumours (2%) and tumours of uncertain differentiation (1%) in the decreasing order to frequency. 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%) followed by vascular tumours (18%). Benign tumours of smooth muscle (1%) and tumours of uncertain differentiation are nil encountered. The malignant tumours of adipose tissue accounted for majority of malignant soft tissue tumours (2) followed by tumours of skeletal muscle, blood vessels and peripheral nerve. 37% benign soft tissue tumours were seen in extremities followed by head and neck 31% and for the malignant soft tissue tumours mainly lower extremities followed by trunk and abdomen.

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 tumors 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 85% and malignant tumours was 15% which is in between study of Myher Jensen *et al.*[13] and Lazxim *et al.*[14] whereas M.J. Kransdorf *et al.*[15], reported 60.2% benign and 39.8% malignant soft tissue tumour in their study. In another study of soft tissue tumors of head and neck by Makino[16] stated 96% tumors as benign and 45 % as malignant. In all these 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 much literature. Specific sarcomas tend to appear in certain age groups. In the present study there were 60 males and 40 female out of total 100 causes

of soft tissue tumour with male to female ratio 1.5:1 which is equal to the study of M.S. Kransdorf *et al*.[17] Our study is also comparable with studies of Mynes Jensen *et al*.[13] and Beg.[18] where M:F were 1:1 and 1.8:1 respectively. In present study peak incidence is in age above 60 years followed by age group 50-60 years. Lazim *et al*.[14] 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.[19] 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.[20] where male to female ratio was 1.9:1. Agravat et al.[21] studied 100 cases of soft tissue tumors. Of these 86% were benign, 6% malignant, 2% borderline and 6% were tumor like lesions. The commonest benign tumour was Adipocytic (49%) of all benign tumours of soft tissue followed by vascular tumours (21%) peripheral nerve sheath tumours (19%), fibrous tumours (2%), fibro histiocytic tumours (3%) smooth muscle tumours (2%) and tumours of uncertain differentiation (1%) in the decreasing order to frequency. 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%) followed by vascular tumours (18%). Benign tumours of smooth muscle (1%) and tumours of uncertain differentiation are nil encountered. Myhre-Jensen[5] reported most common benign soft tissue tumours were of adipocytic (48.1%) constitute majority of lipoma followed by benign fibro histiocytic 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 37.5% occur in lower extremities.

In present study 37% benign soft tissue tumours were seen in extremities followed by head and neck 31% which is comparable with Beg *et al*. studies.[18] The studies by Lazim, Beg and Zhi *et al*.[19,22,23] 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*.[19] extremities followed by head and neck. Meis-Kindblom et al.[24] studied eighty cases if angiosarcoma and found most common site was extremities. A study of MPNST from 200 soft tissue sarcomas by Kar et al.[25] reported extremities as most common site followed by chest wall 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[15,17], Gebhard et al.[26] studied clinic pathologic and immuno histochemical features of pleomomphic liposarcomas and found lower extremities as most common site of occurrence. Studies by Olivera AM et al.[27] and Weiss SW et al.[28] 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. Immuno histochemistry 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 histo-pathologic classification and standard nomenclature now offers a better clinic-pathological co-relation. The clinicopathological evaluation is still the gold standard for the proper diagnosis of soft tissue tumors.

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