Original Research

Histopathological Study Of Soft Tissue Tumors In A Tertiary Care Centre Of Rajasthan

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ABSTRACT
Soft tissue sarcomas are relatively rare and comprises 1% of all cancers. Most common site of its occurrence are large muscles of extremities, chest wall, mediastinum and retroperitoneal area in decreasing order, but it can occur any where in body.This study is done to find the incidence of benign and malignant soft tissue tumors and to estimate the age, sex and location of benign and malignant soft tissue tumors.
This retrospective study is conducted in National Institute of Medical Sciences & Research , Jaipur from 1st January 2021 to 31st December 2023. Total 113 cases of soft tissue tumors were analysed in this study, Out of 113 cases , 105 were benign and 8 were malignant .Benign soft tissue tumors outnumbered malignant tumors by a ratio of 13:1. Lipomas and leiomyomas were the most common tumors to be reported in our study. Histopathology remains a mainstay for diagnosis, however ancillary techniques like IHC also plays an important role in making a diagnosis.

Keywords
Soft tissue tumors, Lipoma, Leiomyomas Benign, Malignant

INTRODUCTION

Soft tissue sarcomas are relatively rare and comprises 1% of all cancers.[1] Most common site of its occurrence are large muscles of extremities, chest wall, mediastinum and retroperitoneal area in decreasing order, but it can occur any where in body.[2] Most common age group affected is older patients.[1]
Etiological factors responsible for development of malignant soft tissue sarcomas are genetic factors, environmental factors, viral infections and immune deficiency.[2] Other factors responsible are prolong exposure to thermal or acid burns, a fracture site, surgical site and vicinity of plastic or metal implant.[3] Environmental carcinogens like asbestos, phenocyacetic acid and chlorophenols can also lead to sarcomas however radiation induced sarcomas are very rare. Most incidents are of breast carcinoma patients treated with radiation of more than 5000cGy or more as adjuvant.[4]
Benign soft tissue tumours occur due to familial or inherited basis.[2] Most common examples are hereditary multiple lipoma. Patients with familiar Gardner syndrome often develop desmoid tumour. Neurofibromatosis is associated with benign nerve tumors.[2]
This study is done to find the incidence of benign and malignant soft tissue tumors and to estimate the age, sex and location of benign and malignant soft tissue tumors.

MATERIAL AND METHOD

This retrospective study is conducted in National Institute of Medical Sciences & Research , Jaipur from 1st January 2021 to 31st December 2023. Total 113 cases of soft tissue tumors were analysed in this study, Formalin fixed paraffin embedded sections were stained with Hematoxylin and Eosin and studied thoroughly. Histopathological diagnosis was given and results obtained were analysed. These cases were divided into lipomatoustumor, smooth muscle tumor, skeletal muscle tumor, fibrous tumor, fibrohistiocytictumor, peripheral nerve sheath tumors and blood vessels tumor. These cases were further divided on the basis of age, sex, clinical features, gross and microscopic findings.

RESULT

Out of 113 cases, 105 were benign and 8 were malignant (Table 1). Out of 41 lipomatoustumor 39 were benign and 2 were liposarcoma. 35 cases of

lipoma out of 39 (88%) were classical type and 4 were of fibrolipoma. Benign smooth muscle tumors were next most common tumor accounting for 35 cases.

Benign vascular tumor account for 15 cases out of which 13 cases were hemangioma and 2 cases were angiofibroma. Malignant tumors were not observed in this category.

Peripheral nerve sheath tumor accounts for 13 cases in total. Out of which 10 were benign and 3 were malignant. Out of 10 benign cases 7 were schwannoma and 3 were neurofibroma. 3 cases of MPNST (Malignant peripheral nerve sheath tumor) were reported in male patients.

5 cases of fibrohistiocytictumor were seen, out of which 4 were benign and 1 was malignant. 2 cases of fibrous tumor were identified and both were benign. 1 case of malignant skeletal muscle tumor was noted which was identified as rhabdomyosarcoma.

Table 1:- Total 100 cases were divided under following category

Types of tumor	Benign	Malignant	Total	Percentage (%)
Lipomatoustumor	39	2	41	36
Smooth muscle tumor	35	1	36	33
Blood vessel tumor	15	0	15	13
Fibrohistiocytictumor	4	1	5	4
Fibrous tumor	2	0	2	2
Peripheral nerve sheath tumor	10	3	13	11
Skeletal muscle tumor	0	1	1	1
Total	**105**	**8**	**113**	**100**

Table 2- Age wise distribution of soft tissue tumors

Age group (yrs)	Lipomatoustumor	Blood vessels tumors	Nerve sheath tumor	Smooth muscle tumor	Fibrous tumor	Histiocytic tumors	Skeletal tumor
0-10	1	3	0	0	0	0	1
11-20	2	6	6	0	0	0	0
21-30	8	3	3	2	2	1	0
31-40	12	2	3	16	1	1	0
41-50	13	1	0	14	0	1	0
51-60	2	0	1	2	0	2	0
61-70	3	0	0	1	0	0	0
>70	0	0	0	1	0	0	0
Total	**41**	**15**	**13**	**36**	**2**	**5**	**1**

Table 3:- Site wise distribution of soft tissue neoplasm

Distribution of tumors	Head and neck face	Trunk	Upper extremity	Lower extremity	Total
Lipomatoustumor	1	25	12	3	41
Vascular tumors	12	1	1	1	15
Nerve sheath tumor-Schwannoma	2	1	3	1	7
Nerve sheath tumor-Neurofibroma	2	0	1	0	3
MPNST		3			3
Fibrous tumor	1	0	0	1	2
Fibrohistiocytictumor	1	3	1	0	5
Smooth muscle tumor	0	36	0	0	36
Skeletal muscle tumor	0	0	0	1	1
Total	**19**	**69**	**18**	**6**	**113**

Table 4:- Histopathological subtype division of soft tissue neoplasms

Type	Cases
Lipomatoustumor (41)	
Fibrolipoma	4
Classical lipoma	35
Liposarcoma	2

Blood vessels tumor (15)	
Hemangioma	13
Angiofibroma	2
Peripheral nerve sheath tumor (13)	
Neurofibroma	3
Schwannoma	7
MPNST	3
Smooth muscle tumor (36)	
Leiomyoma – classic type	23
Angioleiomyoma	1
Leiomyoma- hyaline type	9
Cellular leiomyoma	2
Leiomyosarcoma	1
Fibrous tumor (2)	
Fibroma	1
Fibromyxoma	1
Fibrohistiocytictumor (5)	
Benign fibrous histiocytoma	4
Malignant fibrous histiocytoma	1
Skeletal muscle tumor (1)	
Rhabdomyosarcoma	1
Total	**113**

DISCUSSION

Soft tissue tumors are relatively rare and constitute less than 1% of all the cancers of the body. Lipomas are the most common neoplasm of mesenchymal origin arising in any location where fat is present. At least one third of benign tumors are lipomas, nearly one third are fibrohistiocytictumors and fibrous tumors, 13% are vascular ,11 % are nerve sheath tumors and 2% are fibrous tumors in our study. In present study, there were 105 benign soft tissue tumours, out of which 39 cases were reported as lipomas which formed largest group among all benign soft tissue tumors, with peak incidence in 3rd to 5th decade and commonest location being trunk. Two commonest variants in the study by Ndukweet al[5] and Lin et al[6] were conventional and fibrolipomas which coordinated with our study also. On gross examination, lipomas presented as encapsulated, yellow, glistening mass, size ranging from 5-10 cm in size. Microscopic examination showed sheets of adipocytes admixed with dilated congested blood vessels and fibrous tissue in few cases. Of the 2 malignant soft tissue tumors in the present study, both cases were reported as liposarcoma , one as dedifferentiated and second as well differentiated liposarcomapresentd on the anterior aspect of thigh of 60 year and 50 year old male patient respectively. Gross examination of these 2 cases showed well circumscribed greasy yellow soft tissue mass with focal haemorrhagic areas on cut surface. On microscopic examination tumor composed of sheets of adipocytes with eccentric placed irregular hyperchromatic nuclei with indentation and vacuolated cytoplasm separated by fibrous septae with focal areas of myxoid change and moderate chronic inflammatory cell infiltrate. In a study by Sharon and Weiss[7] of 92 cases of well differentiated liposarcomas, tumor occurred most frequently in extremity (46 cases), followed by retroperitoneum (23 cases). Our findings were in concordance with their study as our both cases were seen on extremity only. Second most common benign soft tissue tumor in our study were smooth muscle tumor accounting for 36 cases, in which 35 cases were seen in uterine cavity. Uterine leiomyomas are extremely common neoplasm of uterus with estimated rate of 20-40% of women over 30 years of age.[8] Siegel and Gaffey demonstrated rarity of scrotal leiomyoma as only they reported 11 cases in a review of 11000 cases of scrotal tumors.[9] Grossly, leiomyomas presented as greyish white firm masses and on cut surface showed whorled appearance. Microscopy showed benign spindle shape cells arranged in interlacing fascicles. One case showed blood vessels lined by plump endothelial cells with additional smooth muscle, thus diagnosed as angioleiomyoma. In a series reported by Hachisuga et al[10], 66.6% of angioleiomyoma were reported in lower extremity with pain as the presenting complaint and tumor measuring less than 2 cm and. In our study patient gave the history of painful swelling and size of tumor was 3x2x0.5 cm. One malignant tumor was reported under smooth muscle category as leiomyosarcoma of uterus in 44 year patient. Grossly, it presented as single intramural greyish yellow mass 6x5x4 cm. Microscopy revealed spindle shaped cells showing plump nuclei and moderate cytoplasm arranged in interlacing fascicles. Both abnormal and normal mitosis was seen, Following benign smooth muscle tumor, next most common tumor under benign category were vascular tumors, 15 cases were reported. In benign peripheral nerve sheath tumor, neurofibroma were3/10 cases, and schwannoma 7/10

cases. Donner et al[11] over a period of 22 years revealed 288 benign tumors of major peripheral nerve reported neurofibromas the most common followed by schwannoma which doesn't correlate with our study. Gross examination revealed acapsulated mass along with a characteristic gelatinous appearance. Microscopy revealed interlacing bundles of elongated cells with wavy nuclei. Neurofibromas were commonly seen in 2nd decade, with male predominance with head and neck as commonest site which was in accordance with a study by Lin et al[12].In present study, Schwannomas were commonly seen in 3rd and 4th decade and the commonest location was upper extremity. This was in accordance with Enzinger findings.[13] Grossly, these were encapsulated, yellow white in appearance. Microscopy showed Antony A and Antony B areas. MPNST account for approximately 2-3 % of all soft tissue tumor. We reported 3 cases of MPNST occurring in upper extremity only. These 3 cases were reported in 2nd and 3rd decade and were of approximately 8-10cm in dimension. Grossly, they presented as grey white, fleshy, firm to hard with focal haemorrhagic and necrotic areas. Microscopy showed malignant tumor composed of slender shaped cells with wavy nuclei arranged in interlacing fascicles. Tumor cells showed hyperchromasia, pleomorphism, with scant amount of eosinophilic cytoplasm. Few hypercellular and hypocellular areas were also seen with intervening stroma showing mononuclear cell infiltrate with focal areas of necrosis and haemorrhage. In a study by Ducatman et al[14] of 120 cases of MPNST, 52 were male and 68 were female. In our study 15 cases of benign vascular tumor were reported, 13/15 cases were of haemangiomas and 2/15 cases of angiofibroma. Head and neck region was commonest location with peak incidence in 2nd decade. Gross examination of all showed grey white, soft, polypoidal bits ranging from 0.5 to 1 to 2 cm. Microscopy examination revealed vaguely lobular pattern having numerous blood vessels lined by plump endothelial cells. In few cases large dilated vascular channels were also seen. Malami et al[15] study showed vascular tumor as the commonest soft tissue tumor of childhood with majority of the cases were hemangiomas (27.3%), with male predominance and head and neck as common site which correlated with our study. In our study 5 cases of fibrohistiocytictumor were reported, 4/5 cases were benign fibrohistiocytictumor, and 1 MFH. 3/5 cases were noted in trunk and 1 in each in head and neck and at upper extremity. Fletcheret al[16] in their study of benign fibrous histiocytoma, noted male predominance with lower limb being the most common site. Weiss and Enzinger[17] in their study analysed 200 cases of MFH and tumor occurred mainly on extremities (lower followed by upper) with peak incidence between 61 to 70 years with male predominance. The rate of local recurrences of tumor was 44 % and of metastasis 42 % with commonest site being lung and lymph node. In our study, tumor was in lower extremity but we could not comment on local recurrences as there was no follow up. Under category of fibrous tumors, 2 cases were benign and comprised of 2 cases each of fibroma and fibromyxoma. However in this study we reported a patient with mass in trunk. Rhabdomyosarcoma is not only the most common soft tissue sarcoma in children under 15 years of age but also one of the most common soft tissue sarcoma of adolescents and young adults[18]. We reported a case of rhabdomyosarcoma in 8 year old patient who presented with mass over a left thigh since 2 years. Grossly mass was lobulated, grey white and cut surface of growth showed a gelatinous area with areas of hamorrhage and necrosis. Microscopy showed hypocellular and hypercellular areas. Hypercellular area showed round strap like cells, typical cross striations and classical rhabdomyoblast were seen.

CONCLUSION

Benign soft tissue tumors outnumbered malignant tumors by a ratio of 13:1. Lipomas and leiomyomas are most common tumors to be reported in our study. Tumor location provide an additional help in diagnosis. As sarcomas are mostly develops as deeply located mass. Histopathology remains a mainstay for diagnosis, however ancillary techniques like IHC also plays an important role in making a diagnosis.

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Conflict of interest
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