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Original Research Article

Soft tissue neoplasms: a clinicopathological study

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ABSTRACT

Background: The current WHO classification has categorized soft tissue tumours into benign, malignant and so-called intermediate neoplasms. Soft tissue sarcoma comprises <1% of adult cancers. The aim of the study was to clinically correlate soft tissue neoplasms and study the histomorphological features of various malignant soft tissue tumors.
Methods: This was a retrospective study conducted in a tertiary care hospital in Mangalore, India from January 2019 to June 2020. Clinical details of all cases of soft tissue neoplasms retrieved from the medical records of our institution. Data collected included age, gender, presenting symptoms, site and size of soft tissue neoplasms and clinical diagnosis. Pathological diagnosis of these tumours was made and details recorded.
Results: A total of 113 cases of soft tissue neoplasms were collected. 94.4% benign and 18.6 %. malignant tumours were present. 77% cases presented with swelling whereas 23% presented with pain. Majority of benign soft tissue tumours were located in the trunk (36.9%) and the most common type was lipomas (66.38%). Malignant soft tissue tumours showed male to female ratio of 1.33:1. Most predilection was noted for the extremities (42.8%) and leiomyosarcomas were the most common type (38%).
Conclusions: The incidence of malignant soft tissue tumours is rare. Majority of the cases were noted in the extremities. Leiomyosarcoma was the most common type, in our study. Lipomas were the most common benign soft tissue tumours, and majority of the benign tumours were located in the trunk.

Keywords: Soft tissue, Neoplasm, Sarcoma, Malignant

INTRODUCTION

Soft tissue is the nonepithelial extra skeletal tissue of the body that is exclusive of the reticuloendothelial system, glia, and supporting tissue of various organs. Voluntary muscles, fat, and fibrous tissue, along with the vessels which serve these tissues represent soft tissue. Soft tissue, embryologically is derived principally from mesoderm, along with some contribution from the neuroectoderm.[1,2]

Tumors derived from soft tissue comprise of a highly heterogeneous group and are classified according to the adult tissue they resemble.[1] They are most commonly found to involve the upper and lower extremities, trunk retro-peritoneum and head and neck; however soft tissue tumours can occur anywhere in the body.[1,3]

The current WHO classification has categorized soft tissue tumours into benign, malignant and so-called intermediate neoplasms; which are locally aggressive or rarely metastasizing neoplasms. [4]

The incidence of benign soft tissue tumours are more as compared to the malignant soft tissue tumours.[3,5] Soft tissue sarcomas are rare tumours and comprise of <1% of adult cancers and 15% of pediatric tumours.[6,7] Criteria such as cellularity, mitotic count, tumor differentiation and necrosis are used in grading of soft tissue sarcomas. Tumor size, microscopic grade, location, margins,

clinical staging, DNA ploidy and genetic alterations are all important factors in determining the prognosis of these tumours.[8] Light microscopy supplemented by, special stains and immunohistochemistry form the cornerstone in the diagnosis of soft tissue tumours.[3,5]

This study was conducted with the aim of clinically correlating soft tissue neoplasms as well as to study the histomorphological features of various malignant soft tissue tumors.

METHODS

This was a retrospective study conducted in a tertiary care hospital in Mangalore, India, over a period of one and a half years (January 2019-June 2020). Clinical details of all cases of soft tissue neoplasms during this time period; both benign and malignant were retrieved from the medical records of our institution. Data collected included age, gender, presenting symptoms, site and size of soft tissue neoplasms and clinical diagnosis.

Excision specimens as well as biopsy specimens were included. The specimens were received in the Department of Pathology. Gross findings like size, shape, colour and consistency, were noted. The specimens were then fixed in 10% neutral formalin for 24 hrs. 3-5 mm thick sections from representative areas was submitted for routine processing.

Sections were then studied by light microscopy after H and E staining. Histological subtypes were classified according to WHO classification of soft tissue tumors. Grading of the tumours was performed using the FNCLCC (French Federation of Cancer Centers Sarcoma Group) grading system. Immunohistochemical study was also advised in some of the soft tissue malignant tumors to support the diagnosis. Data was analysed and represented in the form of tables, pie charts and bar diagrams.

RESULTS

A total of 113 cases of soft tissue neoplasms were collected during the period of one and a half years. The age distribution of the patients varied over a wide range of from 1 to 80 years of age. Majority of the cases (77%) presented with swelling/ mass whereas 23% presented with pain as the primary complaint. (Figure 1)

Benign neoplasms accounted for 94.4% of soft tissue neoplasms, with sizes ranging from 2-14cms. Of these, majority were diagnosed as lipoma (66.38%), followed by nerve sheath tumours including both schwannoma and neurofibroma (14.1%), haemangioma (7.6%), gastrointestinal stromal tumours (5.4%), palmar/ plantar fibromatosis (2.2%), glomus tumour (1.08%), fibrous histiocytoma (1.08%), leiomyoma (1.08%) and tenosynovial giant cell tumour (1.08%) (Figure 2).

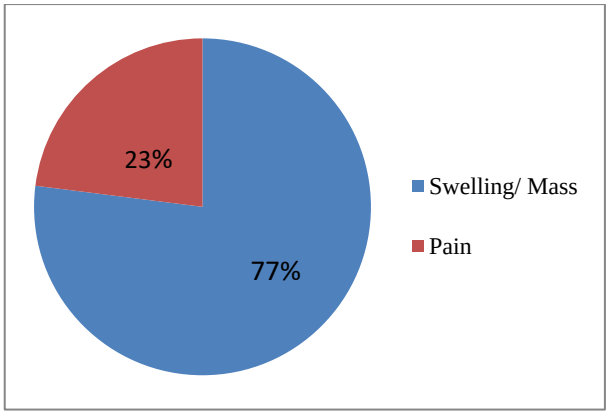

Figure 1: Symptoms experienced by the patient at first presentation.

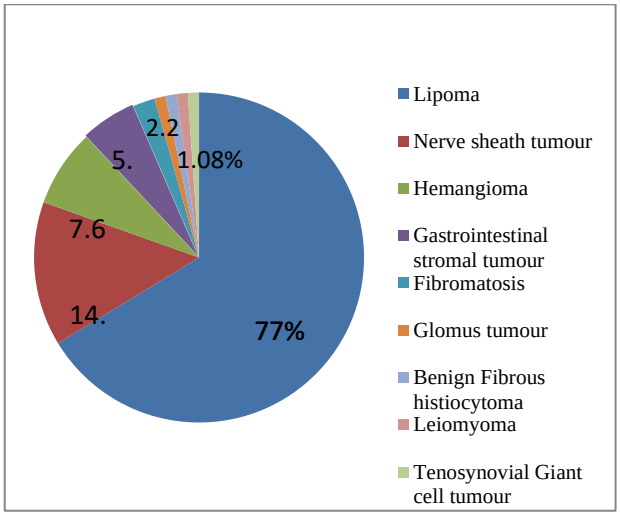

Figure 2: Percentage of various types of benign soft tissue neoplasms.

Majority of the cases of benign soft tissue tumours were located in the trunk (36.9%) followed by extremities (10.8%-lower limb; 23.9%-upper limb), 21.7% cases in head and neck and 6.5% cases in the retroperitoneum and stomach.

Out of 113 cases, there were 21 cases of malignant soft tissue sarcomas (18.6%). The malignant soft tissue tumours showed a slightly greater predilection for males (57%) as compared with females (43%) in our study, with a male female ratio of 1.33:1. Ages ranged from 30-78 years, with majority of cases presenting in 3rd and 4th decades (28.6%). (Figure 3).

Location wise, the malignant soft tissue tumours showed most predilection for the extremities (42.8%) followed by the retroperitoneum (23.8%), head and neck (9.6%), back (9.6%), abdominal wall (4.76%), pelvis (4.76%) and vagina (4.76%). (Figure 4). The size of the tumours ranged from 7-30cm.

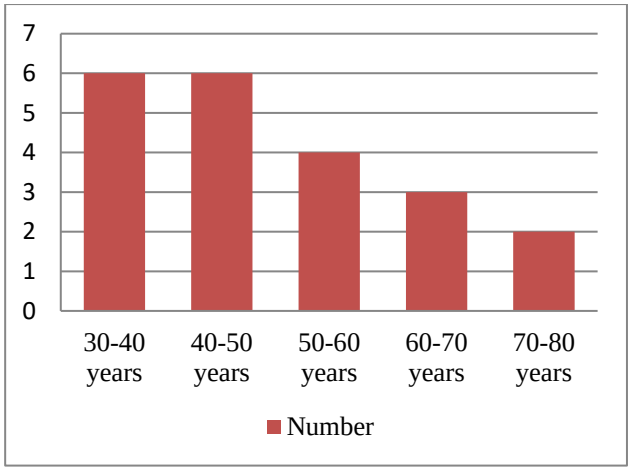

Figure 3: Age distribution of malignant soft tissue tumours.

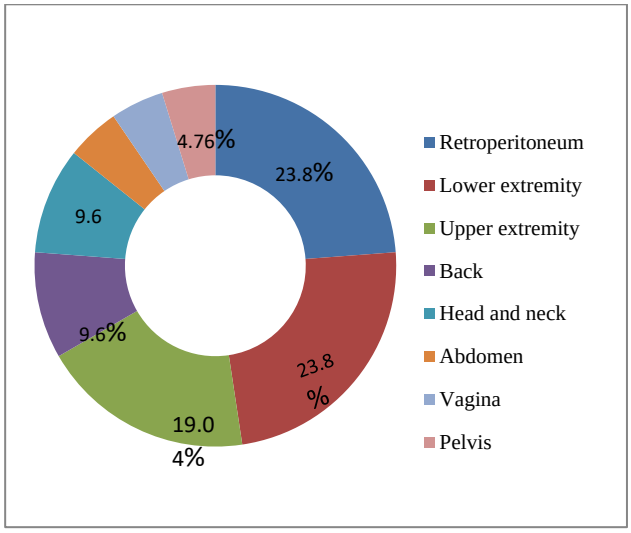

Figure 4: Location of malignant soft tissue tumours.

Leiomyosarcomas were the most common among the malignant soft tissue tumours, accounting for 38% of the cases (n=8). 4 cases were located in the retroperitoneum, with one case each in the vagina, pelvis, forehead and thigh. A majority of the cases diagnosed on excision specimen were of grade 3 (n=3). (Table 1, Figure 5A, Figure 6A)

Pleomorphic undifferentiated sarcomas were the second most common accounting for 23.8% of the cases (n=5). Greater predilection was observed for the extremities, with one case each located in the arm, hand, knee back, and abdomen. All cases were high grade (grade 3). (Table 1, Figure 6C)

Myxofibrosarcomas accounted for 9.5% (n=2) of the cases, with both cases located in the thigh. Both the cases were high grade (grade 3). (Table 1) There was a single case of liposarcoma (n=1), located in the retroperitoneum, which was a grade 1 tumour. (Table 1, Figures 5B, 5C, 6B)

Other soft tissue sarcomas included a single case of malignant soft tissue tumour diagnosed with a primary differential of dermatofibrosarcoma protuberans with sarcomatous overgrowth, located in the scalp. Four cases were diagnosed as high-grade spindle cell sarcomas on biopsy with request for further evaluation.

Table 1: Frequency of various malignant soft tissue tumours.

Tumour type	Frequency (%)
Leiomyosarcoma	n=8, 38
Pleomorphic undifferentiated sarcoma	n= 5, 23.8
Myxofibrosarcoma	n=2, 9.5
Liposarcoma	n=1, 4.76
Others	n=5, 23.8

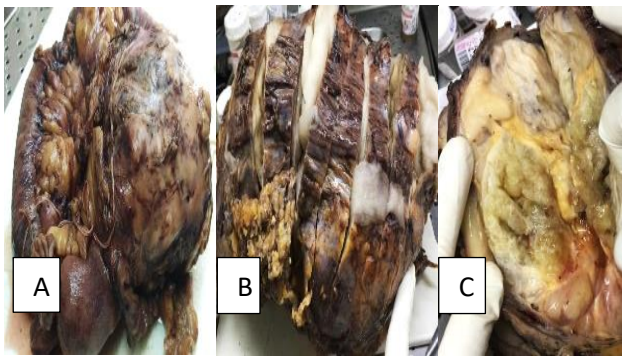

Figure 5: A. Gross specimen of retroperitoneal leiomyosarcoma. Large globular mass seen with an irregular surface, and part of attached intestine. B. Gross specimen of specimen of myxofibrosarcoma. Outer surface is irregular. C. Gross specimen of myxofibrosarcoma, cut surface of tumour shows variegated appearance with myxoid areas

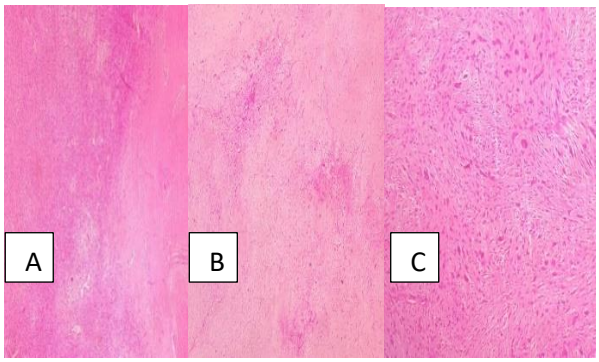

Figure 6: A. H and E, 4x Leiomyosarcoma: Shows tumour composed of pleomorphic spindle cells arranged in sheets, with areas of necrosis. B. H and E, 4x Myxofibrosarcoma: Shows tumour composed of spindle cells in a prominent myxoid background. C. H and E, 10X. Pleomorphic sarcoma: Shows pleomorphic and bizarre tumour cells arranged as fascicles

DISCUSSION

Our study was conducted over a period of one and a half years, with a total of 113 cases of soft tissue neoplasms. Lipomas comprised a majority of the benign soft tissue neoplasms (77%), followed by nerve sheath tumours (14.1%) and haemangiomas (7.6%). A similar finding was found by Baste BD et al, in their study.[9] Ramnani BG et al reported maximum frequency of lipomas as well, however the second most common benign soft tissue neoplasm in their study was found to be haemangioma, followed by nerve sheath tumours.[10] Most of the benign soft tissue neoplasms in our study were located in the trunk (36.9%) followed by the extremities and head and neck region. This was in concordance with the findings of Ramnani BG et al.[10]

Swelling was the main complaint (77%) by patients at presentation followed by pain (23%), in our study. This is in keeping with the findings of Jenna P et al and Aliyu UM in their respective studies.[11,12]

Malignant soft tissue sarcomas in our study, comprised of 18.6% out of the total number of 113 cases. A similar study by Venkataraman J et al, reported an incidence of 14.6% of malignant soft tissue tumours over a period of four years.[3] A slightly greater male preponderance was noted in our study with respect to the occurrence of malignant soft tissue tumours. This was in contrast to the study by Venkatraman J et al, who reported a male to female ratio of 1:1.6.[3] However, it was similar to the findings by Jenna P et al who reported a male female ratio of 1.7:1 as well as a study done by Aliyu UM, whore reported a male female ratio of 1.93:1.[11,12]

The age distribution of the malignant cases in our study varied from 30-78 years, with maximum number of cases seen in the 3rd and 4th decades of life. This was comparable to the findings of Jennna P et al, where 44% cases of malignant soft tissue tumours were noted between 30-50 years of age.[11] The tumour sizes of the malignant cases varied from 7-30 cm. Dreinhofer KE, reported a size range of 2-30 cm, in their study.[9]

We found a maximum number of soft tissue sarcomas occurring in the extremities (42.8%), followed by the retroperitoneum and other regions. Venkatraman J et al reported a similar finding, with 75% of their cases occurring in the extremities.[3] Aliyu UM et al, Jenna P et al and Gulia A noted greater predilection of these tumours for the extremities as well.[11-13]

The most common soft tissue sarcoma was found to be leiomyosarcoma (38%), in our study, followed by pleomorphic undifferentiated sarcoma and myxofibrosarcoma. We found varying results in this regard in a number of studies. Venkatraman J et al reported fibrosarcoma as the most common soft tissue sarcoma in their study.[3] Jenna P et al noted that liposarcomas constituted a maximum of the cases of soft tissue sarcomas in their study.[11] Aliyu UM et al reported rhabdomyosarcoma as the most common tumour, in both adult as well as paediatric age groups.[12] In a study spanning 13 years, Fang found malignant fibrous histiocytomas to be the most frequent type. [14]

CONCLUSION

Soft tissue neoplasms are tumours that consist of a spectrum of histological types. The epidemiological characteristics of these neoplasms have been found to vary widely in several literatures. The present study is a clinicopathological study of 113 cases of soft tissue neoplasms over a period of one and a half years. Vast majority were benign accounting for 94.4%, out of which lipomas were most common. Benign soft tissue neoplasms were located most frequently on the trunk, followed by other sites. Our study showed 18.6% cases of malignant soft tissue tumours having a greater male preponderance. The 3rd and 4th decades showed maximum number of occurrences of soft tissue sarcomas with the most common histotype being leiomyosarcoma. The most frequent location was found to be the extremities, which has been documented in most other reports as well.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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