

Original Research Article

Histopathological study of soft tissue tumours in a tertiary health centre in southern part of Assam

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ABSTRACT

Background: Soft tissue tumors are defined as mesenchymal proliferations which occur in the extraskeletal non-epithelial tissues of the body, excluding the viscera, coverings of brain and lymphoreticular system. The objective of this study was to study the histopathological features of soft tissue tumors and to study the occurrence of soft tissue tumors in relation to age, sex and anatomical site.

Methods: This study comprised of 89 cases studied over a period of two years. All soft tissue tumors, their gross features, microscopic findings were analysed in detail. Soft tissue tumors were divided into benign and malignant categories and further sub typing were done according to World Health Organization (WHO) classification. The distribution of soft tissue tumors according to the age, sex and site of occurrence was studied.

Results: Out of 89 cases of soft tissue tumors, 76 cases were benign, 4 cases belonged to intermediate category and 9 cases were malignant. Adipocytic tumors formed the largest group constituting 39 cases. Vascular tumors were the second commonest (26 cases) followed by peripheral nerve sheath tumors (11 cases). The benign tumors were seen in younger age as compared to malignant tumors. Malignant soft tissue tumors was seen to be more common in male than female and pleomorphic sarcoma and liposarcoma was commonest (3 cases each).

Conclusions: Benign tumors were more common than malignant. The most common benign tumors were lipoma followed by hemangioma and schwannoma. The most common malignant tumor was pleomorphic sarcoma. The benign tumors were seen in younger age as compared to malignant tumors.

Keywords: Soft tissue tumors, Adipocytic tumors, Vascular tumors

INTRODUCTION

Soft tissue is defined as the complex of non-epithelial extra skeletal structures of the body exclusive of the supportive tissue of the various organs and the hematopoietic/lymphoid tissue. Soft tissue tumors (STTs) are a complex group of pathologically diverse childhood and adult neoplasms with differentiation towards mesenchymal tissue, which may arise almost anywhere in the body.¹

STTs are classified according to the tissue that they recapitulate or principally based on line of differentiation of tumors, rather than the type of tissue from which they developed. They include tumors of voluntary muscle, fat, fibrous tissues, tumors of vessels serving them and peripheral nervous tissues. However, in some STTs, no corresponding normal counterpart is known.²

Soft tissue sarcomas nowadays show an upward trend because of increase in incidence, rising interest in tumour and better capabilities in diagnosing. Benign soft tissue

tumors seem to outnumber malignant tumors by a wide margin. Soft tissue sarcomas occur more commonly in males, but gender and age related incidences vary among the histologic types.

Aims and objective

The objective of this study was to study the histopathological features of soft tissue tumors and to study the occurrence of soft tissue tumors in relation to age, sex and anatomical site. The recommended classification is World Health Organization (WHO) classification of soft tissue tumors and is used widely.

METHODS

Study design

The present study is a retrospective study, carried out at histopathology section of pathology, department of pathology at Silchar Medical College and Hospital, Silchar a tertiary care centre in Cachar district of Assam state, India during the period of June 2017 to May 2019.

Type of study

It was a retrospective type of study.

Data collection procedure

In present study, we analysed all 89 cases which were received for histo-pathology examination under the diagnosis of soft tissue tumours from surgical department. We included small biopsies also.

Inclusion criteria

All the mesenchymal tumours arising from any soft tissue like fibrous tissue, adipose tissue, skeletal muscle, blood and lymph vessels and peripheral nervous system were included in this study.

Exclusion criteria

All the non-mesenchymal tumors, bone tumors and any known already diagnosed tumours were excluded from the study.

All relevant clinical details were obtained from patients or his relatives. Each received surgical specimen in histopathology section were examined grossly for its size, shape, weight, consistency and appearance. Tissue cut surface was also examined for the presence of hemorrhage, necrosis and cystic spaces. Presence or absence of any gross involvement of adjacent structure along with depth of the tumor was also noted. All these specimens were preserved in 10% neutral buffered formalin for fixation for 24 hours. For histopathological evaluation, numbers of sections were taken from different representative sites according to the size of specimen. While in case of small

biopsy specimen the whole specimen was processed. These representative sections were subjected for processing on automatic tissue processor. After processing the section were embedded in paraffin, cut with microtome at 5 micron thickness and stained with hematoxylin and eosin stain. Special staining procedure like periodic acid schiff (PAS) and reticulin stains were also done as and when required.

Samples were collected using stratified random sampling technique.

All the data's were analyzed using Microsoft excel 2013 and figures were drawn using Microsoft word 2013.

An approval for this study was obtained from the institutional ethical committee.

RESULTS

In our study, 89 soft tissue tumors were analyzed, out of which 76 (85.39%) cases were benign, 4 (4.5%) were intermediate and 9 (10.1%) malignant tumors. Adipocytic tumors formed the largest group constituting 39 cases (43.8%). Vascular tumors were the second commonest comprising 26 cases (29.2%) followed by peripheral nerve sheath tumors constituting 11 cases (12.35%).

Table 1 shows a male preponderance in STTs is observed in our study, (male: female – 1.4:1). Table 2 shows that out of total 89 cases, 76 cases (79.8%) were benign, 9 cases (9.9%) were malignant and 4 cases (4.4%) were classified under intermediate category. Adipocytic tumours formed the largest group consisting of 39 cases in this study. Vascular tumours were the second commonest consisting of 26 cases (29.2%) followed by peripheral nerve sheath tumours constituting 11 cases (12.4%).

Most of the benign and intermediate tumours were found to be superficial in location, i.e. dermis and subcutis. Although, we found out that malignant soft tissue tumours were deeper in location, which included tumours arising from muscle, deep to muscle.

Adipocytic tumours comprised of 39 cases (38.2%) of all soft tissue tumours, out of which 34 cases were benign, 2 intermediate and 3 were malignant. Among adipocytic tumours, males are more than the females. The most common site of benign adipocytic tumours was upper limb and trunk whereas that of malignant adipocytic tumours was lower limb.

Table 3 shows the age range of patients in our study and we found that the age of the patients in our study ranged from 9 months to 89 years. Benign STTs were common in younger population, whereas malignant STTs were found to be more common in the fifth and sixth decade.

The most common site of soft tissue tumours as a whole is head and neck, and second most common site is upper

limb. Although benign tumours were seen to be maximum in head and neck, whereas intermediate in upper limb, and malignant tumours found to be more in lower limb.

The vascular tumours were the 2nd most common soft tissue tumours and also the 2nd most common benign tumours, the majority of which was hemangiomas. We saw a wide range of age distribution in benign vascular tumours, most commonly diagnosed in 3rd and 4th decades. Of the 26 vascular tumours, 17 cases were seen in head and neck region followed by 9 cases in the upper limb.

Out of all soft tissue tumours, 11 cases were diagnosed as peripheral nerve sheath tumours (12.4%). Out of them all were benign, out of which 6 cases were of schwannoma and 5 neurofibroma. Of the 11 peripheral nerve sheath tumours reported, 7 were males and 4 were females. Out of 2 fibroblastic tumours, 1 case was malignant, dermatofibrosarcoma protuberans and 1 belonged to intermediate category, lipofibromatosis.

Among 4 tumours of fibrohistiocytic differentiation, 1 cases were diagnosed as intermediate and 3 belonged to malignant category. Fibrohistiocytic tumours were found to have a wide range of age distribution from 2nd decade to 8th decade of life. All the 3 malignant cases were

reported in thigh. 1 case was diagnosed in 5th decade and 2 cases were diagnosed in 6th decade.

Figure 1 shows hypercellular Antoni A and hypocellular Antoni B areas and nuclear palisading; Figure 2 shows closely packed spindle cells with spaces containing little blood; Figure 3 shows storiform pattern, irregular fascicles with pleomorphic and bizarre tumor cells; Figure 4 shows cellular areas with sheets of small, stellate, spindled and round cells with scant cytoplasm and scant oval nuclei, and tadpole cells; and Figure 5 shows whorled pattern, with cells containing eosinophilic cytoplasm and monomorphic, ovoid to elongated nuclei.

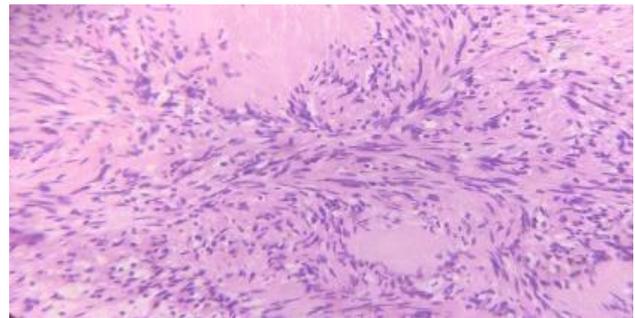


Figure 1: Photomicrograph of Schwannoma (H&E stain 40X).

Table 1: Sex distribution of the cases.

Total cases	Male	%	Female	%	Male: female ratio
89	52	58.43	37	41.57	1.4

Table 2: Distribution of soft tissue tumours according to tumour differentiation and type of neoplasm.

Tumor differentiation	Benign	%	Intermediate	%	Malignant	%
Adipocytic	34	38.2	2	2.2	3	3.3
Vascular	26	29.2	0	0.0	0	0.0
Peripheral nerve sheath tumour	11	12.4	0	0.0	0	0.0
Fibrohistiocytic	5	0.0	1	1.1	3	3.3
Skeletal muscle	0	0.0	0	0.0	2	2.2
Fibroblastic	0	0.0	1	1.1	1	1.1
Total	76	79.8	4	4.4	9	9.9

Table 3: Age distribution of the cases.

Tumor differentiation	Benign	%	Intermediate	%	Malignant	%
Up to 10	9	10.11	0	0.0	0	0.0
11-20	15	16.85	0	0.0	0	0.0
21-30	35	39.32	0	0.0	0	0.0
31-40	14	15.73	1	1.1	0	0.0
41-50	2	2.24	2	2.2	0	0.0
51-60	1	1.12	1	1.1	5	5.6
61-70	0	0.0	0	0.0	3	3.3
71-80	0	0.0	0	0.0	0	0.0
81-90	0	0.0	0	0.0	1	1.1
Total	76	85.37	4	4.4	9	10

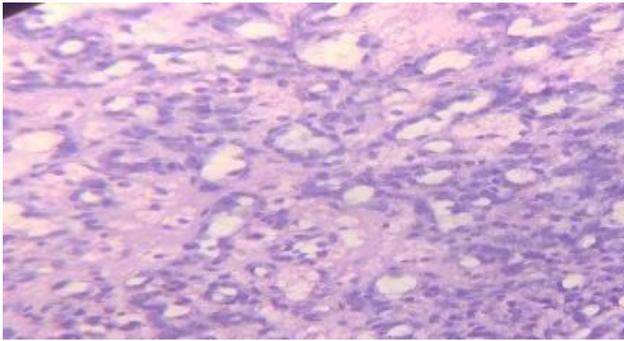


Figure 2: Photomicrograph of capillary hemangioma (H&E stain 40X).

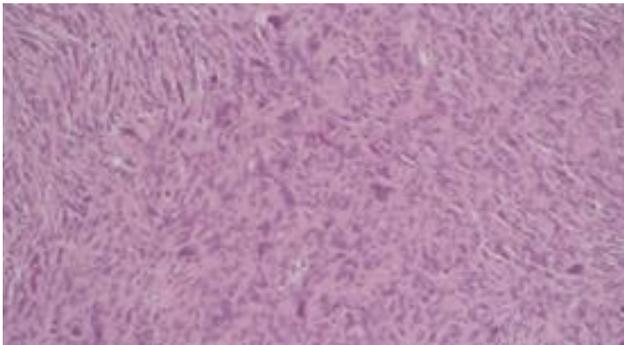


Figure 3: Photomicrograph of pleomorphic sarcoma (H&E stain 40X).

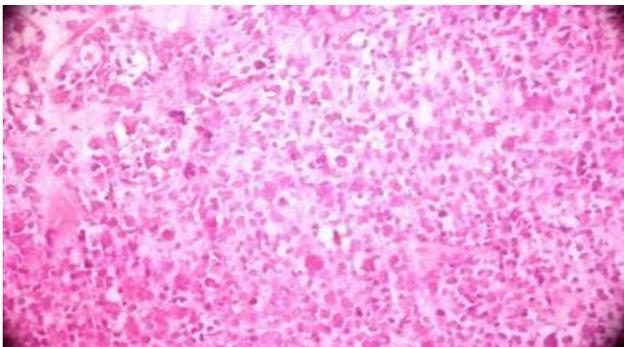


Figure 4: Photomicrograph of rhabdomyosarcoma (H&E stain 40X).



Figure 5: Photomicrograph showing dermatofibrosarcoma (H&E stain 40X).

DISCUSSION

STTs are defined as mesenchymal proliferations that arise in the extra skeletal nonepithelial tissue of the body exclusive of the viscera, coverings of the brain and lymphoreticular system.³ It comprises of fibrous connective tissue, adipose tissue, skeletal muscle, blood/lymph vessels, and the peripheral nervous system. Soft-tissue tumors constitute a large and heterogeneous group of neoplasms. Traditionally, tumors have been classified according to histogenetic features.⁴

In our study, 89 soft tissue tumors were analyzed, out of which 76 (85.39%) cases were benign, 4 (4.5%) were intermediate and 9 (10.1%) malignant tumors. This is in concordance with the study conducted by Singh et al in which 200 soft tissue tumors were analyzed, out of which 169 (84.5%) cases were benign, 11 (5.5%) were intermediate and 20 (10.0%) malignant tumors.⁵

In the study done by Singh et al, out of 270 STTs analyzed, benign tumors were highest followed by malignant and intermediate tumors.⁶ Similar findings were also seen in studies conducted by Agravat et al and Stout.^{1,7}

The age range of the patients in our study ranged from 9 months to 89 years. Benign STTs were found to be common in younger population, whereas malignant STTs were more common in the fifth and sixth decade. This finding was in concordance with the studies conducted by Agravat et al and Wibmer et al in which benign tumors were common in younger age group as compared to malignant tumors which were recorded maximum in 60-70 years age group.^{1,8}

A male predominance in STTs is observed in our study, (male: female – 1.4:1), which is also seen in studies done by Singh et al, Trojani et al, Ducimetière, Gustafson and Jemal et al.^{6,9-12}

The most common site of benign STTs were in the head and neck as a whole as whereas sarcomas commonly involved the lower limbs. In a study done by Makino et al out of 651 STTs of the head and neck, 96% of them to be benign. Trojani et al and Ducimetière et al also found lower limb (extremities) to be the most common site involved by sarcomas.^{9,12,13}

In this study, we found that adipocytic tumors were the most common tumors constituting 43.8%, followed by vascular tumors (29.2%) and PNSTs (12.35%). These observations were almost similar to the study conducted by Agravat et al and Singh et al.^{1,6} Lipoma formed the bulk of benign adipocytic tumors. Our findings are similar to findings by Agravat et al, Stout, and Kransdorf, who reported 29%, 32.8%, and 16.1% lipomas in their respective studies.^{1,7,14}

In the present study, well-differentiated liposarcomas were seen from the sixth to eighth decade of life with a

predilection for the lower limb in the present study. This was in concordance with the study done by Fisher et al.¹⁵

Vascular tumors were the second most common tumors (29.21%). Among them, hemangiomas were the most common. This observation is in accordance with the studies conducted by Agravat et al, Kransdorf, and Makino et al.^{1,13,14}

In our study Schwannoma and neurofibroma were the most common benign PNST similar to the studies by Kim et al.¹⁶

Fibroblastic tumors were the fourth most common similar to studies by Agravat et al 2 cases of dermatofibrosarcoma were found in our study.¹ Wibmer et al found fibrosarcoma, NOS as the most common MFT in their study, while owing to small sample size, grading of MFT could not be discussed.⁸

We found BFH as the most common fibrohistiocytic tumors with a wide age range (18–70 years) and upper extremity involvement. These findings are in concordance with the studies by Kransdorf.¹⁴

RMS comprised only 2 cases of all STTs. Occurrence of RMS as compared to other soft-tissue sarcomas is quite low. Both cases were seen in the head and neck region and were diagnosed in the second and third decade of life respectively. This result was similar to the studies of Hena Singh et al and Kransdorf who also reported head and neck to be the most common site.^{6,14}

Those tumors in which a definitive diagnosis could not be ascertained were labelled as sarcomas NOS and pleomorphic sarcoma. 3 cases of pleomorphic sarcoma were found in our study. Wibmer et al reported good number of sarcoma NOS cases.⁸

Limitations

The limitation of this study is that it was a hospital based study with small sample size. To validate our findings, further research with bigger sample size is needed.

CONCLUSION

In our study, benign tumors were more common than malignant. Painless mass was the most common presenting symptom in our study. The most common benign tumors were lipoma followed by hemangioma and schwannoma. The most common malignant tumor was liposarcoma and pleomorphic sarcoma. The benign tumors were found to be commoner in younger population whereas malignant tumors were seen in 5th to 6th decade. The most common site of soft tissue tumors as a whole was head and neck. Most favoured site for malignant tumor was lower limb.

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Conflict of interest: None declared

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

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