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Original Research Article

Histopathological Analysis of Soft Tissue Tumours in Different Age Groups and Sex in a Tertiary Care Hospital

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Abstract:

Background: Soft tissue tumors are a variety of lesions that develop from mesenchymal tissues in the body and have overlapping radiological and clinical characteristics. To make the right diagnosis, a histopathological investigation is required. Analysis of the trend and pattern of soft tissue lesions in various age groups and sexes is the primary goal of the current study.

Methods: This prospective study was conducted on all specimens that had a clinical suspicion of being soft tissue lesions. The specimens that have been preserved in formalin are handled and inspected under a microscope.

Results: Out of 200 cases investigated, 97% of the tumors are benign, while 3% are malignant. 3:1 male to female ratio means that men outweigh women. 31–40 year olds (30%) and 21–30 year olds (27%, respectively, saw the highest number of cases. Lipomatous tumors made up the majority of the benign group (87.6%), followed by blood vessel tumors (7.2%). Only males were observed with malignant tumors.

Conclusion: Histopathology is the gold standard diagnostic technique, and a precise diagnosis can only be made after a meticulous and in-depth examination.

Keywords: Soft Tissue Tumours, Malignant, Benign, Lipomatous.

Introduction

Adipose tissue, nerve tissue, blood vessels, muscle, and fibrous tissues are examples of extra skeletal tissues in the body that can give rise to soft tissue tumors, which are mesenchymal neoplasms. [1-3] They are many neoplasms with overlapping radiological and clinical characteristics. [1,2]

Histopathology is therefore required for accurate diagnosis. 15% of all paediatric neoplasms are soft tissue sarcomas, the fourth most prevalent pediatric cancer. [5] These tumors occur at a rate of 1.4 per 100,000 people. [2,4] They are divided into three categories: benign, malignant, and intermediate, and they exhibit regionally aggressive behavior. [2,3] Benign tumours outnumber the malignant ones and estimated to be around 3000/million while malignant tumours are around 30/million. [1]

Males are more commonly affected and the commonest location is extremities followed by head and region and abdominal cavity.1–3 Diagnostic accuracy is increased by using other diagnostic methods like special stains, immunohistochemistry and molecular studies. [3,4]

Materials and Methods

From September 2021 to August 2022, this prospective study was carried out in the pathology department of the Jawaharlal Nehru Medical College and Hospital in Bhagalpur, Bihar.

In the study, the specimens that were sent with a clinical diagnosis or a suspicion of a soft tissue lesion were taken into consideration. The tissues were fixed with 10% formalin and then treated further using the paraffin embedding method.

The patient's data was searched for pertinent clinical history and ultrasound/CT findings. Sections that were meticulously examined using hematoxylin and eosin staining. Special stains were used wherever necessary. Soft tissue tumors were categorized using the 2013 WHO classification of soft tissue tumors.

Results

This study included 200 patients in total, of which 194 (97%) were benign tumors and 6 (3%),

malignant instances. The group's ages ranged from 6 to 65. 60 cases, or 30% of all cases, were found to be in the age range of 31 to 40 years, and 54 cases, or 27%, were in the age range of 21 to 30 years (Table 1). The age groups at the extremities of the spectrum saw very few cases. With a 3:1 male to female ratio, males outnumbered females (Table 2).

Table 1: Age wise distribution of cases

Age in years	No. of cases (n=200)	Percentage
1-10	6	3.0%
11-20	24	12.0%
21-30	54	27.0%
31-40	60	30.0%
41-50	42	21.0%
51-60	10	5.0%
61-70	4	2.0%

Table 2: Sex wise distribution of cases

Sex	No. of cases (n=200)	Percentage
Male	150	75.0%
Female	50	25.0%
Total	200	100.0%

Out of 194 cases investigated in the benign category, 170 cases (87.6%) of the lesions were lipomatous tumours, which made up the majority of the lesions. Blood artery tumors, which accounted for 14 cases (7.2% of all cases), were the second most frequent benign and soft tissue tumors. Hamartoma and benign fibrous histiocytoma both occurred in 2 cases (1.03%).

There was 1 case (0.5%) each of neurofibroma, tenosynovial giant cell tumor, nonossifying fibroma, panniculites, fibroxanthoma, and lymphangioma (Table 3).

Table 3: Distribution of Benign Lesions

Diagnosis	No. of cases	Percentage
Lipoma	170	87.6%
Hemangioma	14	7.2%
Benign fibrous histiocytoma	2	1.0%
Neurofibroma	1	0.5%
Hamartoma	2	1.0%
Tenosynovial giant cell tumour	1	0.5%
Non-ossifying fibroma	1	0.5%
Panniculitis	1	0.5%
Fibroxanthoma	1	0.5%
Lymphangioma	1	0.5%

Male individuals tend to have benign lesions. A benign fibrous histiocytoma has spindle cells with little cytoplasm, thin, elongated nuclei, and pointed ends. These cells are intermingled with various numbers of inflammatory cells, foam cells, and siderophages. Large lymphatic channels bordered by endothelial cells can be found in a connective tissue stroma in lymphangiomas.

When examined under a microscope, a giant cell tumor of the tendon sheath exhibits various admixtures of mononuclear cells and giant cells that resemble osteoclasts in a dense collagenous stroma (Figure 2). In a non-ossifying fibroma, hemosiderin, scattered histiocytes, and fibroblasts are organized in a storiform pattern (Figure 3).

Round to spindle cells with little cytoplasm and distinctive strap cells are the hallmarks of rhabdomyosarcoma (Figure 4). Large polygonal cells with prominent nucleoli and granular, eosinophilic cytoplasm are organized in well-defined nests and separated by fibrous stroma in alveolar soft part sarcomas (Figure 6).

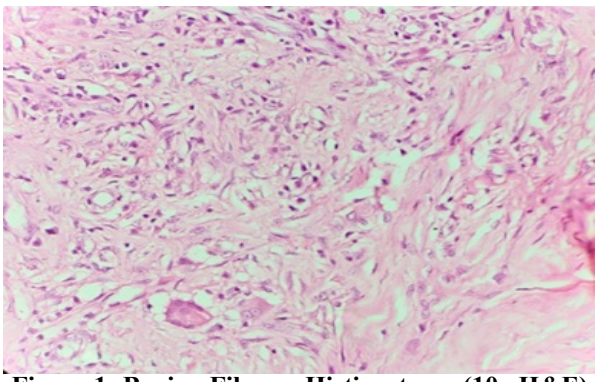

Figure 1: Benign Fibrous Histiocytoma (10x,H&E)

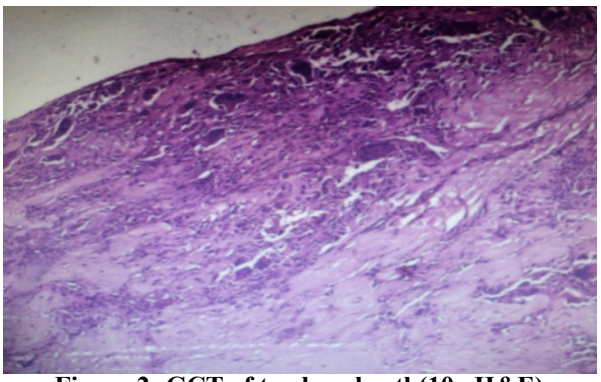

Figure 2: GCT of tendon sheath(10x,H&E)

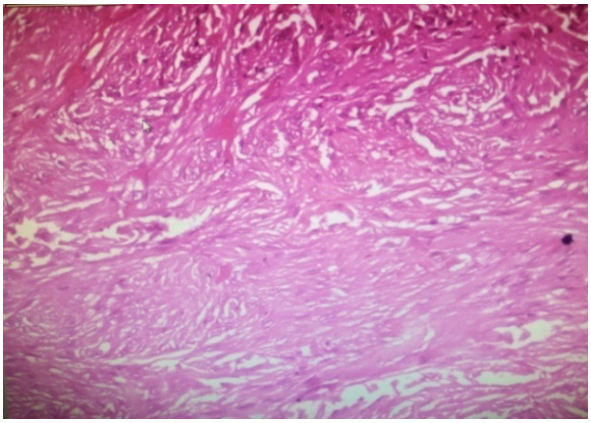

Figure 3: Nonossifying fibroma (10x,H&E)

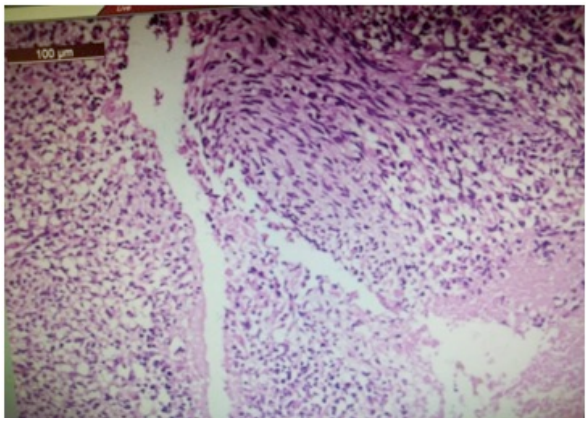

Figure 4: Rhabdomyosarcoma (10x, H&E)

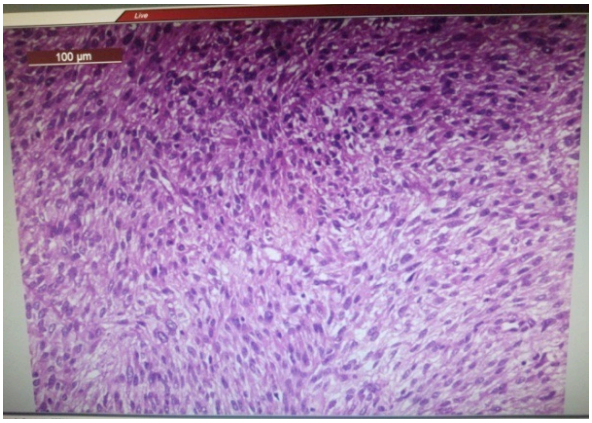

Figure 5: Malignant Fibrous Histiocytoma (10x, H&E)

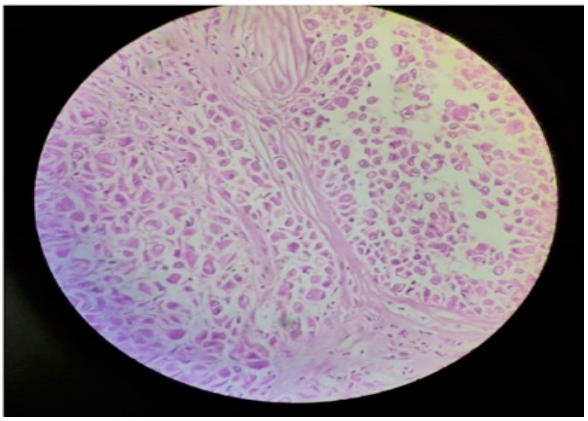

Figure 6: Alveolar soft part sarcoma (10x, H&E)

Malignant fibrous histiocytoma and rhabdomyosarcoma each had two instances (1% each), whereas alveolar soft part sarcoma and synovial sarcoma each had one case (0.5%). Males made up the majority of the malignant cases (Tables 4 and 5).

Table 4: Distribution of Malignant Lesions

Diagnosis	No. of cases	Percentage
Alveolar soft part sarcoma	1	0.5%
Rhabdomyosarcoma	2	1.0%
Malignant fibrous histiocytoma	2	1.0%
Synovial sarcoma	1	0.5%

Table 5: Histopathological types of soft tissue tumours

Type of tumours	No. of cases
Lipomatous tumours	170
Tumours of blood vessels	14
Tumours of lymph vessels	1
Peripheral nerve sheath tumour	1
Fibroblastic tumour	2
Fibrous tumours	2
Fibrohistiocytic tumours	1
Tumours of uncertain type	4
Tumours of synovial sheath	1
Tumours of skeletal muscle	2
Miscellaneous	2

Discussion

The lower extremity, particularly the thigh, accounts for 40% of all soft tissue tumors, which are lesions of extra skeletal tissues in the body. The trunk and retroperitoneum account for 30% of all soft tissue tumors, the upper extremity 20%, and the head and neck region 10%. [5] They are a heterogeneous collection of illnesses that exhibit close histological similarities, overlapping clinical characteristics, and overlapping radiological signs, necessitating rigorous microscopic inspection to provide an appropriate diagnosis.

200 cases in all were examined for this investigation. Six (3%) of the 194 cases (or 97%) of benign tumors were malignant tumors. According to research by Jain P et al [6], Jain S et al [4], and Narayanan et al. [3], the incidence rates were 93.8%, 90.6%, and 89.7%, respectively. In our analysis, there were 6 cases of malignant lesions, which is equivalent to Narayanan et al 3 cases (2.8%) and Jain P et al 9.4%.

The incidence of malignant lesions was slightly greater in Sajjad M et al [5] and Peterson et al [7], at 34.08% and 49%, respectively. Patients do not seek medical attention for benign lesions since they do not show many clinical symptoms or grow rapidly, and for the same reason, not all benign tumors are surgically removed. The precise incidence may be difficult to calculate as a result.

In our study, there were three times as many male patients as female ones. Similar results were found in investigations by Harpal et al. [1], Jemal et al. [8], Mirza et al. [9], with a male to female ratio of 1.1:1, 1.2:1, and 1.1:1 respectively.

In our analysis, there were more cases between 31 and 40 years old (30%) than between 21 and 30 years old (27%). This is comparable to studies by Agaravat et al. [10], Baig MA et al. [11], and Jobanputra et al. [2], which indicated a higher occurrence in those between the ages of 31 and 40. Maximum cases were found in studies by Jain et al. [6] and Jain S. et al. [4] in people between the ages of 21 and 30 and 51 to 60, respectively.

In the current study, 170 cases (87.6%) of benign lesions were lipomatous tumors, which formed the majority of benign lesions. Blood vessel tumors, which accounted for 14 instances (7.2% of all seen cases), were the second most prevalent benign and soft tissue tumors. All six cases of malignancy, which included one each of alveolar soft tissue sarcoma and synovial sarcoma and two each of rhabdomyosarcoma and malignant fibrous histiocytoma, were observed in men.

With incidence rates of 85% for lipomatous tumors and 7% for vascular tumors, respectively, these two types of soft tissue tumors made up the majority of the soft tissue tumors we saw in our study.

The incidence rate of adipocytic tumors was found to be 33%, 46%, 50%, and 47.4%, respectively, in investigations by Agaravat et al, Harpal et al, Jain P et al [6], and Jain S et al [4].

Conclusion

The many neoplasms known as soft tissue tumors have varying prognostic consequences. Light microscopy can be used to diagnose the majority of tumors, but it requires extensive and meticulous investigation to provide a precise diagnosis.

As a result, the gold standard diagnostic method is histology.

Wherever warranted, the use of supplementary procedures can improve diagnostic accuracy.

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