

# Histological Spectrum of Benign Soft-Tissue Neoplasm in a Tertiary Care Center

## Abstract

**Background:** Benign soft-tissue tumors are very frequently received specimen in surgical pathology as compare to malignant one. **Aims:** The purpose of the study is to calculate the incidence and prevalence of benign soft-tissue tumors, to calculate their frequency in different age, sex, and site distribution in tertiary care hospital, and to study their different histological types. **Subjects and Methods:** We studied all soft-tissue tumors received in histopathology department in 4 years. All clinical parameters such as age, sex, incidence, site and size of swelling, gross, and microscopy of the lesions were studied carefully. **Statistical Analysis Used:** Data were analyzed using a Chi-square test. **Results:** Total 360 (9.9%) soft-tissue tumors were received, 330 (91.7%) were benign, and 30 (8.3%) were malignant. The incidence of benign and malignant tumors was more common in males (55.8%) than in females (44.2%). The peak incidence of benign tumors was in 21–30 years. The most common site for benign tumors was the extremities, followed by head and neck. Lipomas formed major bulk of benign tumors (52.4%), followed by vascular tumors (21.2%), peripheral nerve sheath tumors (20.9%), fibrous tumors (3.3%), fibrohistiocytic tumors (1.8%), smooth muscle tumors and tumors of uncertain differentiation (0.3%) in descending order. **Conclusions:** Benign soft-tissue tumors were most commonly occurring lesions in clinical practice. From this study, we were re-evaluate the clinical data of benign soft-tissue tumors, there histological types along with age, sex, and site distribution.

**Keywords:** Benign, hemangioma, lipoma, malignant

## Introduction

Soft tissue is nothing but a nonepithelial extra skeletal tissue of the body without reticuloendothelial system, glia, and supporting tissue of various parenchymal organs. It includes smooth muscles, striated muscles, fat and fibrous tissue, with vessels. It also includes peripheral nervous system because tumors from nerves present as soft-tissue masses. Soft tissue is derived embryologically from mesoderm with some contribution from neuroectoderm.<sup>[1]</sup>

Benign soft-tissue tumors 100 times more common than malignant one. The annual clinical incidence of benign soft-tissue tumors has been estimated as up to 3000/million population.<sup>[2]</sup> They occur in any part of the body, most commonly in extremities, trunk, abdomen, and head and neck.<sup>[3]</sup>

It is sometimes possible to make an accurate diagnosis by detail clinical history, physical

examination, and naked eye examination of the tumors. Clinical features such as age of the patient, location and size of the tumor help greatly in narrowing down the differential diagnosis. A definite relationship exists between soft-tissue tumor type and the age of presentation.<sup>[4]</sup>

Light microscopic evaluation of hematoxylin-eosin-stained section remains the standard technique for the diagnosis of these tumors and for predicting the clinical behavior of the tumor.<sup>[5]</sup>

Most patients with suspected soft-tissue neoplasm present with a painless mass, although pain is reported in one-third of cases.<sup>[6]</sup> Diagnosis is delayed in such cases; frequently misdiagnoses include posttraumatic or spontaneous hematoma and “lipoma.”

Benign soft-tissue tumors are very frequent as compare to benign bone tumors.

Benign tumors of soft tissue are more common than benign tumors of bone. They can occur anywhere in body like in between

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muscles, ligaments, blood vessels, and nerves. These tumors extensively differ in appearance and behavior.

The motive of this study was to assess the benign soft tissue tumors according to their different histology patterns, age groups, sex, and site distribution. To correlate our data with different studies done by different authors.

This variability, diversity, and uniqueness of these tumors produce interest of undertaking a study on soft-tissue tumors.

## Subjects and Methods

This study was done in 4-years period from June 2008 to June 2012 in a tertiary care hospital. We obtained total 330 benign soft-tissue cases. Detailed clinical data such as age, sex, and site of tumor were collected. We categorized them under extremities, trunk-abdomen, and head-and-neck region.

Gross examination was done in detailed with tumor size, consistency, presence of necrosis, hemorrhage, calcification, status of capsule, surgical margin of resection, and invasion or adhesion of tumor to the adjacent structures.

The tissues were fixed in 10% formalin and processed through standard paraffin embedding technique.<sup>[7]</sup> Sections of approximately 5  $\mu$  was taken and stained by routine hematoxylin and eosin.<sup>[8]</sup>

A Chi-square test was used, which showed that these results were statistically significant.

**Table 1: Sex incidence of benign soft tissue tumors**

Tumors	Sex (%)		Total (%)
	Male	Female	
Adipocytic	93 (25.8)	80 (22.2)	173 (48)
Fibrous	7 (1.9)	3 (0.8)	10 (2.7)
Fibrohistiocytic	3 (0.8)	3 (0.8)	6 (1.6)
Smooth muscle	1 (0.3)	0	1 (0.3)
Skeletal muscle	0	0	0
Blood vessels	41 (11.4)	29 (8)	70 (19.4)
Peripheral nerve sheath tumors	36 (10)	33 (9.2)	69 (19.2)
Tumors of uncertain differentiation	0	0	0
Total	181 (50.3)	149 (41.3)	330 (91.6)

**Table 2: Incidence of age in benign soft-tissue tumors**

Tumors	Age (years)							Total
	0-10	11-20	21-30	31-40	41-50	51-60	>60	
Adipocytic	3	16	47	38	26	24	19	173
Fibrous	0	2	2	1	3	1	1	10
Fibrohistiocytic	0	1	3	0	0	1	1	6
Smooth muscle	0	0	0	0	1	0	0	1
Skeletal muscle	0	0	0	0	0	0	0	0
Blood vessels	19	20	12	8	4	3	4	70
Peripheral nerve sheath tumors	3	13	11	19	11	5	7	69
Tumors of uncertain differentiation	0	0	0	0	1	0	0	1
Total	25	52	75	66	46	34	32	330

## Results

Benign soft-tissue tumors represented 9.04% (330 cases) of all tumors and 71% (2590 cases) received during these 4-year study.

Nearly 91.7% (330 cases) formed bulk of benign soft-tissue tumors in all soft-tissue tumors received.

Benign soft-tissue tumors had slightly male preponderance having male-to-female ratio was 1.2:1.

Adipocytic tumors are more common in male, followed by blood vessels tumor, and while in females, adipocytic tumors are common, followed by peripheral nerve sheath tumors [Table 1].

The highest prevalence of benign soft-tissue tumors was in the third decade, adipocytic tumors are more frequent in that, while blood vessel tumors are more common in the first and second decades [Table 2].

Extremities were the most common location for benign tumors, there after head-and-neck region was common. Adipocytic tumors are more commonly found on back and shoulder, while blood vessel tumor are seen in head-and-neck region. Peripheral nerve sheath tumor was commonly seen in extremities and head and neck [Table 3].

The most common benign tumor in this study was lipoma (52.4%) form all benign tumors, followed by vascular tumors (21.2%), peripheral nerve sheath tumors (20.9%), fibrous tumors (3.3%), fibrohistiocytic tumors (1.8%), and smooth muscle tumors and tumors of uncertain differentiation (0.3%) in descending order.

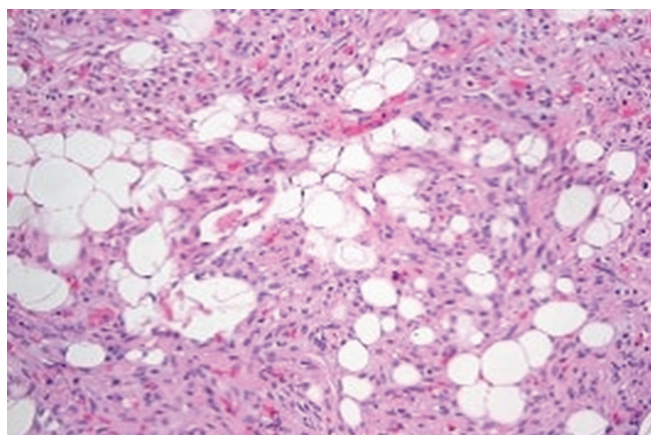
## Discussion

Soft-tissue tumors are very rarely obtained samples in histopathology department. In our study, we received 330 benign soft-tissue tumors; we recorded clinical data which includes age, sex, and location of tumor. Along with also record the incidence and different microscopic pattern of soft-tissue tumors. We have compared our results with similar studies in India and abroad. Thus, data available

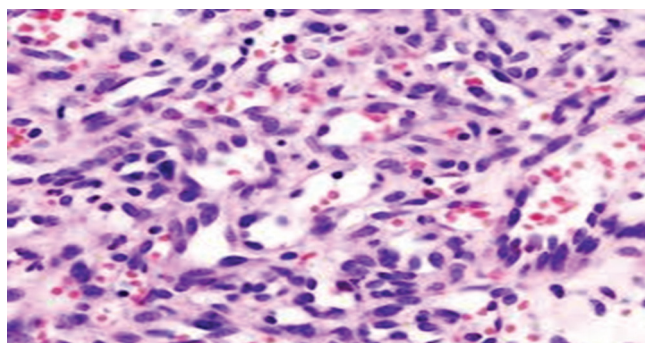
**Table 3: Site distribution of benign soft-tissue tumors**

Tumors	Extremities		Head and neck	Back and shoulder	Trunk and abdomen	Others	Total
	Upper	Lower					
Adipocytic	30	27	29	64	22	1	173
Fibrous	1	3	0	1	5	0	10
Fibrohistiocytic	4	1	1	0	0	0	6
Smooth muscle	0	1	0	0	0	0	1
Skeletal muscle	0	0	0	0	0	0	0
Blood vessels	4	10	48	2	5	1	70
Peripheral nerve sheath tumors	15	13	28	9	2	2	69
Tumors of uncertain differentiation	0	0	0	0	1	0	1
Total	54	55	106	76	35	4	330

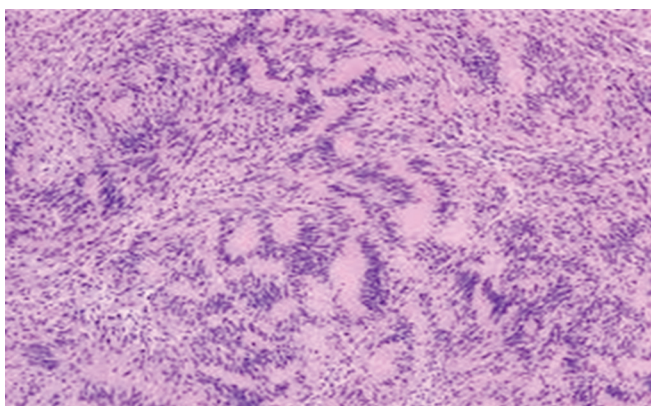
Benign soft-tissue tumors show predilection for extremities (109 cases) mainly lower extremities, followed by head and neck (104 cases)



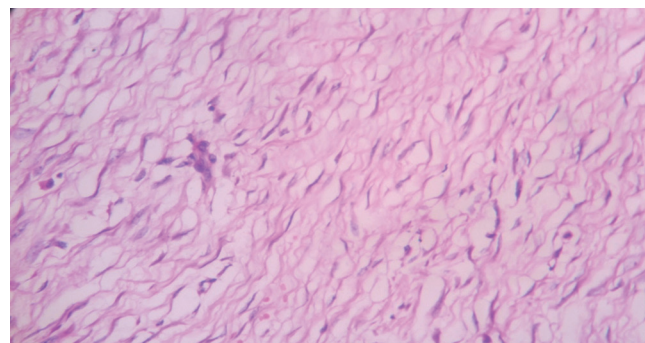
**Figure 1: Spindle cell lipoma** shows bland spindle cells are blended within the scattered Mature adipocytes. (Paraffin & E, X400)



**Figure 2: Capillary haemangioma**- Multiple dilated by thinned walled vascular channels surrounded by spindle cells. (Paraffin, H & E, X400)



**Figure 3: Schwannoma**- Neoplastic cells form short palisades with interposed fibrillary collections of cell processes, designated as Verocay bodies. (Paraffin, H & E, X 100)



**Figure 4: Neurofibroma** - proliferation of fibroblasts and Schwann cells with wavy nuclei are noted Within fibrillary stroma scattered mast cells are seen. (Paraffin, H & E, X400)

for comparison are from different geographic areas and of different time periods. Collective studies of all types of soft-tissue tumors are very few as compared to individual soft-tissue tumor.

In the present study, the frequency of benign tumors was 91.7% which is nearer to Myhre-Jensen study<sup>[9]</sup> [Table 4].

Benign soft-tissue tumors found more often in male than female, ratio is 1.2:1 in the present study, which is similar to Myhre-Jensen<sup>[9]</sup> 1981, Kransdorf,<sup>[10]</sup> 1995, Beg *et al.*<sup>[12]</sup>

In the present study, age ranged from 2 months to 72 years and 35.5 years is the average age of benign tumors which is comparable with studies done by Myhre-Jensen.<sup>[9]</sup> 1981, Hassawi *et al.*<sup>[3]</sup> in 2010, and Agravat *et al.*<sup>[13]</sup> 2010 reported average age 44.5, 27.6, and 26.6, respectively [Table 5].

In our study, the most common site of benign tumors is an extremity (33%) mainly lower extremity, followed by head-and-neck region (32.1%), which is comparable with Beg *et al.* in 2012 study showing common location of benign tumors in extremities (40.9%) then head and neck (35.5%).<sup>[12]</sup> Kransdorf, 1995, also reported the same site incidence as 60.6% in extremities and 13.8% in head and neck<sup>[10]</sup> [Table 6].



Lipoma (52.4%) is the most common benign tumor found, followed by hemangioma (21.2%) and schwannoma (20.9%) which is comparable to Myhre-Jensen<sup>[9]</sup> 1981 and Kransdorf study<sup>[10]</sup> 1995.

### Conclusion

Diagnosis and management of soft-tissue tumor is team work. Benign soft-tissue tumors are more frequently received specimen in surgical practice which required simple excision. Histopathology examination of all tumors should be necessary. In our study, we studied the various types of benign soft-tissue tumors and their relative incidence, prevalence, distribution in age, sex, and site of tumors.

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### Conflicts of interest

There are no conflicts of interest.

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**Table 4: Comparative analysis of incidence of benign soft tissue tumors**

Authors	Number of tumors	Benign (%)
Myhre-Jensen <sup>[9]</sup>	1403	1331 (94.6)
Kransdorf <sup>[10]</sup>	31,047	18,677 (60.2)
Lazim and Al-Irhayim <sup>[11]</sup>	213	178 (83.6)
Hassawi <i>et al.</i> <sup>[3]</sup>	93	70 (75.2)
Beg <i>et al.</i> , <sup>[12]</sup>	126	105 (83.3)
Present study	360	330 (91.7)

**Table 5: Comparative analysis of age incidence of benign soft-tissue tumors**

Authors	Ave age benign (years)
Myhre-Jensen <sup>[9]</sup>	44.5
Hassawi <i>et al.</i> <sup>[3]</sup>	27.6
Agravat <i>et al.</i> <sup>[13]</sup>	26
Present study	35.5

**Table 6: Comparative analysis of anatomical site distribution of benign soft-tissue tumors**

Authors	Extremities (%)	Head and neck (%)	Trunk and abdomen (%)
Kransdorf <sup>[10]</sup>	11,319 (60.6)	2569 (13.8)	3757 (20.1)
Beg <i>et al.</i> , <sup>[12]</sup>	43 (40.9)	37 (35.3)	23 (21.9)
Present study	109 (33)	106 (32.1)	35 (10.6)

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