

Original Research Article

Soft Tissue Tumors: Incidence and Distribution in a Tertiary Care Centre

Jignasha M. Patel¹, Gunvanti B Rathod², Kamlesh J. Shah³^{1,2}Associate Professor ³Professor & Head, Department of Pathology, GMERS Medical College, Halar road, Nanakwada Valsad, Gujarat 396001, India.**Corresponding Author:****Gunvanti B. Rathod**, Associate Professor
Department of Pathology, GMERS Medical
College, Halar road, Nanakwada Valsad,
Gujarat 396001, India.**E-mail:** dr.jignashapatel@gmail.com**Received on** 30.08.2018,**Accepted on** 17.09.2018**Abstract**

Background: Soft tissue tumors are mesenchymal proliferation, that occur in extraskeletal, non-epithelial tissue of the body, excluding the viscera, covering of brain and lymphoreticular system. Benign tumors are more common than malignant soft tissue tumors. Histopathological examination of soft tissue tumor is gold standard method for initial diagnosis and management of patient accordingly. **Aims & Objectives:** 1) To study the occurrence of soft tissue tumors in relation to age, sex and anatomical site distribution. 2) To study histopathological spectrum of soft tissue tumors. 3) To study frequency of occurrence of benign and malignant soft tissue tumors. **Material and Methods:** This retrospective study include total 97 soft tissues biopsy specimens which were received from January 2015 to July 2018. After processing and microscopic examination of tissue sections histopathological diagnosis given and tumors were classified according to WHO classification and result were correlated with clinical details of patient. **Result:** Peak age of incidence of soft tissue tumors was between 2nd to 5th decades. Male: Female ratio was 1:1. Benign tumors (97.93%) were more common than malignant tumors (2.06%). Most common soft tissue tumor was adipocytic tumors. **Conclusion:** Proper gross examination of the specimen and adequate sampling of the tumors and histopathological diagnosis of tumor by light microscopic evaluation of H&E stained sections remain the gold standard technique for initial diagnosis and further management of soft tissue tumors and is sufficient for the majority of cases.

Keywords: Soft Tissue Tumor; Histopathology; Benign; Malignant.**Introduction**

Soft tissue can be defined as nonepithelial extraskeletal tissue of the body exclusive of the reticuloendothelial system, glia, and supporting

tissue of various parenchymal organs. It consist voluntary muscles, fat, fibrous tissue, blood vessels and peripheral nervous system because tumors arising from nerves present as soft tissue masses and pose similar problems in differential diagnosis and therapy. They are developing embryologically

from mesoderm, with some contribution from neuroectoderm [1].

These are a highly heterogeneous group of tumors that are classified according to the adult tissue they resemble. Within the various histogenetic categories, they are usually divided into benign, intermediate and malignant forms [1]. Benign tumors are more common than malignant ones in ratio of 100:1 [2]. Histopathological examination act as a useful diagnostic technique in the initial diagnosis of tumors.

Aims & objective of this study are 1. To study the occurrence of soft tissue tumors in relation to age, sex and anatomical site distribution. 2. To study histopathological spectrum of soft tissue tumors. 3. To study frequency of occurrence of benign and malignant soft tissue tumors.

Subjects and Methods

This retrospective study include total 97 biopsy specimens of soft tissue tumors which were received from January 2015 to July 2018. Patient's personal and clinical history were noted from requisition form. All specimens were received in 10% formalin. After proper gross examination, multiple sections were taken from representative site, processed and paraffin block were prepared from it. Microtome sections were taken over slide from paraffin block and slides stained by Hematoxylin and eosin (H & E) stain and mounted by DPX. These prepared histopathology slides were reported by a Pathologist under light microscope. Histopathological diagnosis were made and all diagnosed tumors were classified according to WHO classification of soft tissue tumor and details obtained were analyzed.

Results

Majority (97.93%) of the soft tissue tumors were benign in nature, whereas 2.06% cases were

malignant. Benign: Malignant ratio was 47.5:1 (Table 1). Benign tumors are more commonly reported in age range of 20 to 60 years whereas malignant nature were found in the 40 to 60 years of age range (Table 2). Out of total 97 cases in this study, 49 (50.51%) cases were of Male and 48 (49.48%) cases were of female patients. M:F ratio was 1:1 (Table 3). In this study, majority of the soft tissue tumors were found in the lower limb (33 cases, 34.02%), followed by trunk (24 cases, 24.74%), lower limb and Head & neck (20 cases, 20.61% in each) (Table 4). Amongst the benign soft tissue tumors adipocytic tumors were most common variety reported followed by benign vascular tumor tumors, whereas in malignant tumors, fibrosarcoma and pleomorphic undifferentiated sarcoma were reported in this study (Table 5).

Discussion

Soft tissue tumors are relatively rare and constitute less than 1% of all the cancers. Benign mesenchymal tumors are far more common than malignant tumors. The annual clinical incidence of benign soft tissue tumors has been estimated up to 3000/million population i.e.-less than 1% of all the malignant tumors [3].

In present study incidence of benign soft tissue tumor was 97.93% whereas incidence of malignant tumor was 2.06% and Benign to malignant ratio was 47.5:1. In the study of Mirza et al. [4] the incidence rate of Benign tumor was 82%, malignant tumor were 18%, and benign: malignant ratio was 4.70:1 whereas in study by Jobanputra et al. [5] benign tumors were 89.3%, malignant tumors were 10.7% and benign:malignant ratio was 8.3:1 which is quite lower as compared to our study. The difference found in the result is might be due to awareness of patients and recent newer advance technique of diagnosis, tumor can be detected at very early stage (Table 1).

In the present study majority of benign soft tissue tumors occurred in second, third, fourth and fifth

Table 1: Total 97 cases were divided under following category.

| Type of tumor | Benign | Malignant | Total | Percentage |
|-------------------------------|--------|-----------|-------|------------|
| Adipocytic tumor | 57 | 0 | 57 | 58.76% |
| Fibroblastic tumor | 10 | 1 | 11 | 11.34% |
| Fibrohistiocytic tumor | 6 | 1 | 7 | 7.21% |
| Vascular tumor | 16 | 0 | 16 | 16.49% |
| Peripheral nerve sheath tumor | 6 | 0 | 6 | 6.18% |
| Total | 95 | 2 | 97 | 100% |
| Percentage | 97.93% | 2.06% | 100% | |

decade of life, and majority of malignant soft tissue tumors occurred in third, fourth and fifth decade of life, these findings are good correlated with study by Jobanputra et al. [5] (Table 2).

Out of 97 cases, there were 49 (50.51%) male and 48 (49.48%) female patients. There were 48 male and 47 females in the benign category with a ratio of 1.02:1 and total 1 males and 1 females in the malignant with a ratio of 1:1. which was correlated with study by Mirza et al. [4] and Jobanputra et al. [5] (Table 3).

In our study, most common location of soft tissue tumors observed in lower limb (33 cases, 31.95%), followed by trunk (23 cases, 24.74%), upper limb and head & neck region (20 cases in each, 20.61%). which is also well correlated with study by Dowerah Swagata et al. [6] (Table 4).

In present study, there were 95 benign soft tissue tumors, out of which 57 (58.76%) cases were reported as benign adipocytic tumor which formed largest group among all benign soft tissue tumors, with peak incidence in 2nd and 5th decade of life and commonest location was lower limb. In benign adipocytic tumor we reported 54 cases of conventional lipoma, 2 cases of fibrolipoma and one case of angiolipoma, all these findings are good

coordinated with study by Ndukwe et al. [7] and Lin et al. [8] were conventional and fibrolipomas were commonest variants reported (Table 5).

As per a study by Batra et al. [9] 89.2% of all soft tissue tumors were benign and 10.8% were malignant. Lipoma was the most common soft tissue tumor comprising 65.7% of all the benign tumors. In study by Jain et al. [10] benign and malignant tumors comprising 90.6% and 9.4% respectively and lipoma was the most common tumor (50.27% cases) reported followed by vascular tumors (20%)

In study by Umarani M.K et al. [11] also reported 92.2% of benign cases and 5% malignant. Rest were of intermediate category and again the largest histological group was adipocytic tumor followed by nerve sheath tumors. Overall adipose tissue tumors appear to be the most common category of tumors in all these studies.

Second most common benign soft tissue tumor reported in our study were vascular tumor accounting for 16 (16.49%) cases. 9/16 cases were of capillary haemangioma (Figure 1), 5/16 cases were of cavernous hemangioma and 2/16 were lymphangioma. Head and neck region was commonest location with peak incidence in 2nd decade and male predominance. These findings

Table 2: Age wise distribution of soft tissue tumors with their nature.

| Age group | Category | | Total | Percentage |
|-----------|----------|-----------|-------|------------|
| | Benign | Malignant | | |
| 1-10 | 3 | 0 | 3 | 3.09% |
| 11-20 | 13 | 0 | 13 | 13.40% |
| 21-30 | 21 | 0 | 21 | 21.64% |
| 31-40 | 18 | 0 | 18 | 18.55% |
| 41-50 | 13 | 1 | 14 | 14.43% |
| 51-60 | 17 | 1 | 18 | 18.55% |
| >60 | 10 | 0 | 10 | 10.30% |
| Total | 95 | 2 | 97 | 100% |

Table 3: Sex wise distribution of type of Tumors.

| | Benign | Malignant | Total | Percentage |
|------------|--------|-----------|-------|------------|
| Male | 48 | 1 | 49 | 50.51% |
| Female | 47 | 1 | 48 | 49.48% |
| M:F ratio. | 1.02:1 | 1:1 | 97 | 100% |

Table 4: Anatomical location of soft tissue tumors according to category

| Site | Benign | Malignant | Total | Percentage |
|-------------|--------|-----------|-------|------------|
| Lower limb | 33 | 0 | 33 | 34.02% |
| Upper limb | 20 | 0 | 20 | 20.61% |
| Head & Neck | 19 | 1 | 20 | 20.61% |
| Trunk | 23 | 1 | 24 | 24.74% |
| Total | 95 | 2 | 97 | 100% |

Table 5: Histological types wise category of soft tissue tumors.

| Histological types of tumor | No. of cases | Percentage |
|--------------------------------------|--------------|------------|
| Adipocytic tumor | | |
| Classical Lipoma | 54 | 55.67% |
| Fibrolipoma | 2 | 2.06% |
| Angiolipoma | 1 | 1.03% |
| Fibroblastic tumor | | |
| Fibroma | 10 | 10.3% |
| Fibrosarcoma | 1 | 1.03% |
| Fibrohistiocytic tumor | | |
| Benign fibrohistiocytoma | 2 | 2.06% |
| Giant cell tumor of tendon sheath | 4 | 4.12% |
| Pleomorphic undifferentiated sarcoma | 1 | 1.03% |
| Vascular tumor | | |
| Capillary hemangioma | 9 | 9.27% |
| Cavernous hemangioma | 5 | 5.15% |
| Lymphangioma | 2 | 2.06% |
| Peripheral nerve sheath tumor | | |
| Neurofibroma | 2 | 2.06% |
| Schwannoma | 4 | 4.12% |
| Total | 97 | 100% |

Table 6: Comparative analysis of incidence, age, sex and anatomical site distribution of soft tissue tumors

| Histopathological type | Incidence | | Relation to age (Years) | | | | | | | Sex | | Anatomical site distribution | | | |
|-------------------------------|-----------|--------|-------------------------|-------|-------|-------|-------|-------|-----|------|--------|------------------------------|------------|-------------|-------|
| | No | % | 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | >60 | Male | Female | Lower limb | Upper limb | Head & neck | Trunk |
| Adipocytic tumor | 57 | 58.76% | 2 | 2 | 15 | 8 | 10 | 15 | 5 | 27 | 30 | 20 | 7 | 11 | 19 |
| Fibroblastic tumor | 11 | 11.34% | 0 | 3 | 1 | 3 | 1 | 1 | 2 | 7 | 4 | 4 | 4 | 3 | 0 |
| Fibrohistiocytic tumor | 7 | 7.21% | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 2 | 5 | 2 | 4 | 0 | 1 |
| Vascular tumor | 16 | 16.49% | 1 | 5 | 3 | 3 | 0 | 2 | 2 | 9 | 7 | 4 | 4 | 6 | 2 |
| Peripheral nerve sheath tumor | 6 | 6.18% | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 4 | 2 | 3 | 1 | 0 | 2 |
| Total | 97 | 100% | 3 | 13 | 21 | 18 | 14 | 18 | 10 | 49 | 48 | 33 | 20 | 20 | 24 |

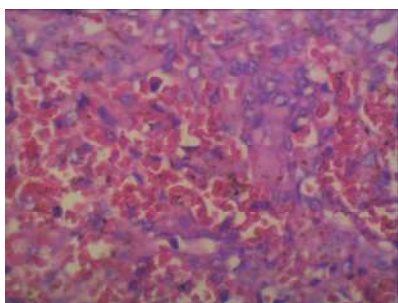


Fig. 1: Capillary haemangioma (H&E stain, 40x)

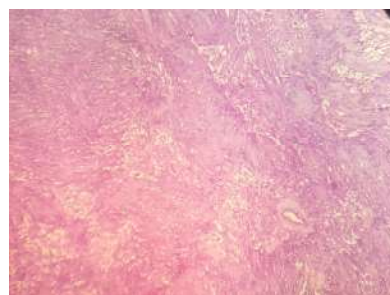


Fig. 3: Schwannoma (H&E stain, 10x)

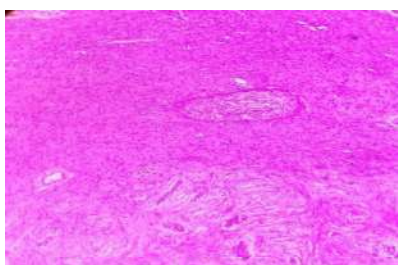


Fig. 2: Neurofibroma (H&E stain, 10x)

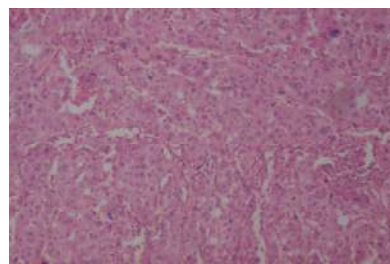


Fig. 4: Pleomorphic undifferentiated soft tissue sarcoma (H&E stain, 4x)

are in good correlation with the studies reported by Geeta Dev et al. [12,13] and Kransdorf [14,15] Malami et al. [16] (Table 6).

Fibrous tumors comprised third most common tumor among all soft tissue tumors in our study, accounted for 11 cases (11.34%) of all soft tissue tumors with most common age of presentation was 2nd and 3rd decade, male predominance and upper and lower extremities were the most common site of tumor. All these findings are comparable with that of study by Mirza et al. [4] and Kransdorf et al. [14,15]. Under malignant category of fibrous tumors, we reported a case of fibrosarcoma in 58 year male patient who presented with swelling in gluteal region. which is also comparable with that of study by Mirza et al. [4] (Table 6).

Amongst peripheral nerve sheath tumors, we reported total 6 cases (6.18%) of which 2 cases were of neurofibroma (Figure 2) and 4 cases were of schwannoma (Figure 3). These tumors were commonly observed in 3rd decade, with male predominance and lower limb as commonest site which was in accordance with a study by Lin et al. [17] (Table 6).

In our study total 7 cases of fibrohistiocytic tumor were reported, 2/7 cases were benign fibrohistiocytic tumor and 4/7 were of giant cell tumor of tendon sheath were reported. Fletcher et al. [18] in their study of benign fibrous histiocytoma, noted male predominance with lower limb being the most common site. In our study, majority were reported in female although the commonest location was the extremities. In malignant fibrohistiocytic tumor we reported one case of pleomorphic undifferentiated sarcoma (Figure 4) in 42 years female patient who presented with mass in chest (Table 6).

Conclusion

Our study revealed that incidence of soft tissue tumors was 97.93% benign and 2.06% malignant category. Extremities were the commonest site for malignant soft tissue tumors. Histopathologically adipocytic tumors were the largest group reported, followed by vascular tumors. Thus careful gross examination of the specimen and adequate sampling of the tumors is essential for diagnosis of soft tissue tumor. Light microscopic evaluation of H & E stained sections remain the standard technique for initial diagnostic approach of these tumors and is sufficient in the majority of cases.

References

1. Weiss & Goldblum: Enzinger and Weiss's Soft Tissue Tumors, 5th ed.
2. A. E. Rosenberg, — Bones, joints, and soft-tissue tumors, Robbins and Cotran Pathologic Basis of Disease, V. Kumar, A. K. Abbas, N. Fausto, and J. C. Aster, Eds., pp.235-249, Saunders, Philadelphia, Pa, USA, 8th edition, 2010.
3. Fletcher CDM, Unni KK, Mertens F (Eds): WHO classification of tumors: Pathology and genetics of soft tissue and bones. IARC press, Lyon 2002.p.12-6.
4. Mirza asif Baig et al., Histological study of soft tissue tumor. International Journal of Science and Research (IJSR): 2005 June;4(6):1039-49.
5. Jobanputra G.P., Parikh U.R., Goswami H.M. Histopathological study of soft tissue tumors (a study of 140 cases) in tertiary care center. Int J Cur Res Rev. 2016 Oct;8(20):43-48.
6. Dowerah Swagata, Thapa Gobil, Saikia Projnan. Spectrum of soft tissue tumours at a tertiary care centre in North East India. Indian Journal of Basic and Applied Medical Research; 2016 Sep;5(4): 303-06.
7. Ndukwe K.C, Ugboko VI, Somotun G, Adebisi, KE Fatusi OA. Clinical pathology study of lipoma of head and neck. Nig JSurg Res 2003;5:12-7.
8. Lin JJ, Lin F. Two entities in angiolipoma: A study of 459 cases of lipomas with review of literature of infiltrating angiolipoma. Cancer 1974;34:720-7.
9. Batra P, Gupta DO, Batra R, Kothari R, Bokarizya P, Pattern of Soft Tissue Tumours In A Rural Population Of Central India. Innovative Journal of Medical and Health Science. 2013 May-June;3(3):124-6.
10. Jain P, Shrivastava A, Mallik R. Clinico morphological Assessment of Soft Tissue Tumors. Sch J App Med Sci. 2014;2(2D):886-90.
11. Umarani M.K, Prima Shuchita Lakra, Bharathi M. Histopathological Spectrum of Soft Tissue Tumors in a Teaching Hospital. IOSR Journal of Dental and Medical Sciences. 2015 April;14(4):74-80.
12. Geeta Dev, Banerjee AK and Aikat BK. Soft tissue tumors Part-I: Benign tumors. The Indian J of Cancer. 1974;336-43.
13. Geeta Dev, Banerjee AK and Aikat BK. Soft tissue tumors Part-II: Malignant tumors. The Indian J of Cancer. 1974;344.
14. Kransdorf MJ. Malignant soft tissue tumors in a large referral population: Distribution of diagnosis by age, sex and location. Am J Roentgenol. 1995; 164:129.
15. Kransdorf MJ. Benign soft tissue tumors in a large referral population: Distribution of specific diagnosis by age, sex and location. Am J Roentgenol. 1995;164:395.

16. Lin BT, Weiss LM, Medeiros LJ. Neurofibroma and cellular neurofibroma with atypis: A report of 14 tumors. *Am J SurgPathol* 1997;21:1443.
 17. Malami SA, Banjo AF. Pathological features of vascular tumors in infants and children in lagos, Nigeria. *Ann Afr Med* 2002;1:92-98.
 18. Fletcher CD. Benign fibrous histocytoma of subcutaneous and deep soft tissue a clinicopathological Analysis of 21 cases. *Am J SurgPathol* 1990;14:801-9.
-