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Original Research Article

A Retrospective Study on the Histopathological Spectrum of Soft Tissue Lesions

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Abstract:

Background: Soft tissue lesions comprise a heterogeneous group of non-epithelial tumors ranging from benign reactive processes to aggressive malignant neoplasms. Histopathological evaluation plays a crucial role in accurate diagnosis and management.

Aim: To analyze the histopathological spectrum of soft tissue lesions and correlate them with clinical and demographic parameters in a tertiary care center.

Methodology: This retrospective observational study was conducted in the Department of Pathology, Bhagwan Mahavir Institute of Medical Sciences, Bihar, over a period of two years. A total of 60 Histoclinicaly/Radiologicaly confirmed cases were included. Clinical details, radiological findings, and microscopic features were reviewed. Data were analyzed using SPSS version 27.0.

Results: The majority of cases occurred in the 41–60 years age group (36.7%) with a slight male predominance (56.7%). Painless swelling was the most common clinical presentation (63.3%). Benign lesions constituted 66.7% of cases, while malignant tumors accounted for 30%. Lipoma was the most frequent diagnosis (25%), followed by fibroma and schwannoma.

Conclusion: Benign soft tissue lesions predominate, but malignant tumors form a significant proportion, highlighting the essential role of histopathology in diagnosis and management.

Keywords: Soft tissue lesions, Histopathology, Lipoma, Sarcoma, Retrospective study.

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Introduction

Soft tissue lesions represent various medical conditions that affect all non-epithelial body tissues which exist outside of skeletal structures and include muscle tissue, adipose tissue, connective tissue, vascular structures, and peripheral nervous system components [1]. The lesions display clinical symptoms that depend on their size and location and their specific characteristics from their benign reactive state to their development into dangerous tumors. The histopathological assessment functions as the primary method for diagnosing and classifying and treating these medical conditions because clinical evaluations together with radiological tests do not sufficiently differentiate between benign and malignant medical conditions. Soft tissue lesions exhibit complex diagnostic challenges because their different morphological characteristics and their shared diagnostic characteristics of reactive and inflammatory and neoplastic disorders require pathologists to perform detailed microscopic assessments which include special immunohistochemical tests to determine their particular diagnosis [2].

Methodology

Study Design: This study was designed as a retrospective observational study aimed at evaluating the histopathological spectrum of soft tissue lesions, including both benign and malignant tumors. The study focused on analyzing clinical features, radiological findings, gross pathological characteristics, and microscopic histopathology to better understand the prevalence, types, and grading of soft tissue lesions in patients attending the study center.

Study Area: The study was conducted in the Department of Pathology, Bhagwan Mahavir Institute of Medical Sciences, Bihar, India.

Study Duration: The study was carried out over a period of 2 years from Jan 2024- Dec 2025.

Study Participants

Inclusion Criteria:

- Patients of all age groups diagnosed with soft tissue lesions, both benign and malignant, during the study period.
- Patients whose histopathology specimens were available and adequately preserved for analysis.
- Patients with complete clinical, radiological, and gross findings documented in the hospital records.

Exclusion Criteria:

- Patients with inadequate or damaged histopathology specimens.
- Cases with incomplete clinical or radiological records.
- Patients who had undergone prior treatment, such as chemotherapy or radiotherapy, which could alter histopathological features.
- Lesions of bony origin without associated soft tissue involvement.

Sample Size: A total of 60 patients with clinically/radiologicaly confirmed soft tissue lesions were included in this study, based on the availability of complete records and specimens.

Procedure: After obtaining informed consent, a detailed history was reviewed from patient records, including presenting symptoms, duration of illness, and previous treatments. In cases where patients were unavailable or in poor condition, relevant history was taken from relatives. Clinical evaluation included tumor location, size, and consistency, along with associated signs such as pain, ulceration, or neurovascular involvement. Radiological assessments, including ultrasonography (USG), X-ray, and other relevant imaging findings, were collected from patient records to correlate with histopathological findings.

Histopathological evaluation was performed using formalin-fixed paraffin-embedded tissue blocks. Sections approximately 5 μm in thickness were cut and stained routinely with hematoxylin and eosin (H&E). Each specimen was examined microscopically to assess cellular morphology, tumor architecture, presence of necrosis, mitotic activity, and other relevant histopathological features. Grading and classification of tumors were done according to the WHO soft tissue tumor guidelines. All findings were recorded systematically to analyze patterns, frequency, and correlation between clinical and histopathological features.

Statistical Analysis: All collected data were entered into SPSS version 27.0 for statistical analysis. Continuous variables, such as age and tumor size, were expressed as mean ± standard deviation, whereas categorical variables, such as tumor type and histopathological grade, were presented as frequencies and percentages. Comparative analyses between benign and malignant lesions were performed using the chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant.

Lipoma	15	25
Fibroma	8	13.3
Schwannoma	7	11.7
Hemangioma	5	8.3
Dermatofibrosarcoma protuberans	2	3.3
Malignant peripheral nerve sheath tumor	5	8.3
Leiomyosarcoma	6	10
Rhabdomyosarcoma	3	5
Synovial sarcoma	4	6.7
Others (granular cell tumor, liposarcoma)	5	8.4
Total	**60**	**100**

Discussion

Soft tissue lesions represent a heterogeneous group of neoplasms arising from mesenchymal tissues such as adipose tissue, fibrous tissue, muscle, blood vessels, and peripheral nerves. In the present retrospective study, benign lesions constituted nearly two-thirds of cases, while malignant tumors accounted for a smaller but clinically significant proportion.

Age distribution in our study revealed peak incidence in the 41–60 years age group, followed by patients above 60 years. A slight male predominance (M:F ratio approximately 1.5:1) was observed in the present study.

Clinically, painless swelling was the most frequent presentation in our study, observed in nearly two-thirds of cases. Histopathologically, adipocytic tumors (particularly lipomas) were the most common benign lesions in the present study.

Among malignant tumors in our study, entities such as malignant peripheral nerve sheath tumor (MPNST), leiomyosarcoma, and synovial sarcoma were identified. The research site distribution showed that extremity lesions occurred more often than head and neck lesions which included lower limb areas.

Overall, the present study corroborates the global trend that soft tissue lesions predominantly affect middle-aged males, commonly present as painless swellings, and are largely benign in nature. However, the consistent documentation of malignant sarcomas across studies emphasizes the necessity of early histopathological evaluation. Accurate morphologic assessment remains the cornerstone for diagnosis, as highlighted across the comparative studies discussed.

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