ORIGINAL ARTICLE

HISTOPATHOLOGICAL PATTERN OF SOFT TISSUES TUMORS AND TUMOUR LIKE LESIONS IN THE PATHOLOGY DEPARTMENT OF LADY READING HOSPITAL PESHAWAR, PAKISTAN

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Background: Soft tissues tumours are tumours of mesenchymal origin excluding epithelial, skeletal tissue, reticuloendothelial system, brain coverings and solid viscera of the body. The objective of this study was to know the histopathological pattern of soft tissues tumours in the Pathology Department of Lady Reading Hospital Peshawar Khyber Pakhtunkhwa Pakistan. **Methods**: This descriptive study was conducted on retrospective data from January 2009 to December 2013. All the soft tissues biopsy specimens were received in 10% formalin, labelled, gross performed, sections processed in alcohol, xylene, wax, block prepared, frozen, microtome sections taken and processed for H&E staining, mounted and reported by a Histopathologist. The inclusion criteria were any sufficient soft tissue tumour biopsy specimen of any age, sex, location in body whereas the exclusion criteria were autolysed biopsy specimen. A minimum of four and maximum of eight sections and 5 micron thick were taken from each specimen. **Results:** A total of 267 soft tissues tumours biopsy specimens were received in the pathology laboratory with age range of 1–75 years, with mean age of 30.68±17.71 years. Male to female ratio was 1.13:1. Amongst the total, benign tumours were 176 (65.91%). Haemangioma, 73 (27.3%) was the commonest tumours followed by lipomas 41 (15.4%) cases. Amongst the total malignant tumours, i.e., 91 (34.08%), rhabdomyosarcoma, 35 (13.1%) was the commonest tumour followed by angiosarcoma 14 (5.2%) cases. **Conclusion**: Haemangioma is the commonest benign tumour and rhabdomyosarcoma is the commonest malignant tumour in this study.

Keywords: Soft tissues tumours; haemangioma; lipoma; rhabdomyosarcoma; histopathology

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INTRODUCTION

The annual clinical incidence of benign soft tissue tumours are up to 3000/million population, whereas that of malignant soft tissue tumours are around 30/million, i.e., less than 1 percent of all malignant tumours of the body. Benign soft tissues tumours are 100 times more common as compared to malignant.[1]

At least one-third of the benign tumours are lipomas, another one third is fibrohistiocytic and fibrous tumours, 10% are vascular tumours and 5% nerve sheath tumours. Of the benign soft tissue tumours 99% are superficial and 95% are less than 5 cm in diameter. Soft tissue sarcomas may occur anywhere but three fourths occur in the extremities with common site is thigh, 10% each in the trunk and retroperitoneum.[2] There is a slight male predominance. Also benign tumours have a very high cure rate after surgical excision. Malignant tumours are aggressive and poses a significant diagnostic and therapeutic challenge since they have more than 50 histological subtypes.[3]

Over the past decade there occurred a significant improvement in the histopathological diagnosis of these tumours because of immunohistochemical and genetic marker development.[2,4] One tenth of the patients of malignant soft tissue tumours have detectable metastases (most common in the lungs) at diagnosis of the primary tumour. Overall, at least one-third of the patients with soft tissue sarcoma die because of tumour metastasis, most common of which is lung metastases.[5]

There are three grades of soft tissue sarcomas based on architectural pattern, mitosis and necrosis. Some tumours have no grading system like synovial sarcoma. The common benign soft tissue tumours are lipoma, haemangioma, benign fibrous histiocytoma whereas the common malignant soft tissues tumours are malignant fibrous histiocytoma, liposarcoma, leiomyosarcoma, synovial sarcoma, and malignant peripheral nerve sheath tumours.[2,7]

The aetiology of most benign and malignant soft tissue tumours is unknown. In rare cases, genetic and environmental factors, irradiation, viral infections and immune deficiency have been found associated with the development of usually malignant soft tissue tumours. There are also isolated reports of soft tissue sarcomas arising in scar tissue, at fracture sites and close to surgical implants. However, the large majority of soft tissue sarcomas seem to arise *de novo*, without an apparent causative factor. Some malignant mesenchymal neoplasms occur in the setting of familial cancer syndromes.[1,8]

Soft tissue tumours can occur at any age. Both benign and malignant soft tissue tumours commonly present as a painless mass. They arise anywhere in the body, where the most common

sites are extremities, trunk, abdominal wall, and head and neck region. Most benign tumours are located superficially by far the most frequent benign tumour is lipoma. Some non-metastasizing tumours such as fibromatosis or intramuscular haemangioma, require wide excision otherwise local recurrence is very frequent.[2,9]

The size and depth of soft tissue tumours are important as most superficial and small sized tumours less than 5 cm are benign, whereas the largest sized and deep tumours are suspicious for malignancy.[10]

Computerized Tomography (CT scan) and Magnetic Resonance Imaging (MRI) are the tests of choice for diagnosis and staging of soft tissue tumours. The malignant soft tissues tumours are relatively uncommon but are amongst the most aggressive tumours of the body.[11]

In the past few decades, the literature review show that the incidence and pattern of soft tissue tumours are subject to considerable geographic and racial variations. Knowledge of the regional peculiarities may can help in the identifications of possible risk factors as well as possible measures for improved diagnosis, treatment and prognosis.[12]

Scarce data is available in the province of KPK regarding the histopathological pattern of soft tissue tumours. So a study of this nature in this area of Pakistan is a requirement. The objective of this study is to see the histopathological pattern of soft tissue tumours in this region.

MATERIAL AND METHODS

This descriptive study on retrospectively collected data was conducted in the Pathology Department Lady Reading Hospital Peshawar KPK. Pakistan. The duration of this study was five years (January, 2009 To December, 2013). All soft tissue tumour biopsy specimen from different hospitals of the province mainly Lady Reading Hospital were collected. A total of 267 cases were obtained. All soft tissue tumour biopsies of any age, sex and location which were subjected to histopathology diagnosis were included.

Non-neoplastic, insufficient and autolysed biopsy specimen were excluded. All the specimens were received in 10% buffered formalin, labelled, representative sections taken and processed in ethanol, xylene and paraffin wax, block prepared, frozen, microtome sections 5 micron thick taken, at least three and maximum of 10 sections were taken depending on the size and nature of specimen. Slides were prepared, stained with Haematoxylin and Eosin, mounted with DPX, labelled and reported by histopathologist.

RESULTS

Total numbers of cases were 267. Age range was from 1 to 75 years with mean age of 30.68±17.71 years (Table-1). Male to female ratio is 1.13:1. Benign tumours were 176 (65.91%) cases, and malignant were 91 (34.08%) cases. Amongst benign tumours haemangiomas were 73 (27.3%) followed by lipoma 41 (15.35%) cases, benign fibrous histiocytoma (BFH) 23 (8.6%) cases, and Schwannoma 14 (5.2%) cases (Table-2). Among the malignant tumours 35 (13.1%) cases were of rhabdomyosarcoma followed by angiosarcoma 14 (5.2%) cases, malignant fibrous histiocytoma (MFH) 12 (4.5%) cases and fibrosarcoma and malignant peripheral nerve sheath tumour (MPNST) 6 (2.2%) and 5 (1.9%) cases respectively (Table-3).

Table-1: Age group of patients in benign and malignant soft tissue tumours (n=267)

Age group	Benign	Percentage	Malignant	Percentage
1–10	27	15.34	16	17.39
11–20	37	21.02	10	10.86
21–30	49	27.84	7	7.60
31–40	25	14.20	14	15.21
41–50	16	9.09	28	30.43
51–60	15	8.52	9	9.78
>60	7	3.97	8	8,69
Total	176	100	92	100

Table-2: Frequency of benign soft tissue tumours (n=176)

Tumour type	Frequency	Percentage	Valid %
Haemangioma	73	41.4	41.4
Lipoma	41	23.29	23.29
Neurofibroma	23	13.06	13.06
Benign fibrous histiocytoma	23	13.06	13.06
Schwannoma	14	7.95	7.95
Nodular Fasciitis	1	0.56	0.56
Myxoma	1	0.56	0.56
Total	176	100	100

Table-3: Frequency and percentages of malignant soft tissue tumours (n=91)

Tumour type	Frequency	Percentage	Valid %
Rhabdomyosarcoma	35	38.46	38.46
Angiosarcoma	14	15.38	15.38
Malignant fibrous histiocytoma	13	14.28	14.28
Synovial sarcoma	9	9.89	9.89
Fibrosarcoma	6	6.59	6.59
MPNST	6	6.59	6.59
Atypical fibroxanthoma	3	3.29	3.29
Liposarcoma	2	2.19	2.19
Alveolar soft part sarcoma	1	1.09	1.09
Angiomyxoma	1	1.09	1.09
Angiomatoid Fibrous histiocytoma	1	1.09	1.09
Total	91	100	100

DISCUSSION

The soft tissue tumours arise from muscle, fat, fibrous tissue, vessels and nerves. Soft tissue tumour may arise in any location, approximately 40% occur

in lower extremity especially in thigh, 20% in upper extremity, 10% in head and neck and 30% in trunk and retroperitoneum. In general tumour arising in superficial location have good prognosis whereas those arising in deep location have bad prognosis. The overall 10 years survival is 40% in sarcomas. Accurate histologic classification and grading is important in establishing the prognosis of sarcomas. Staging also help to determine the prognosis and chance of successful excision of the tumour. The AJCC staging system for soft tissue sarcomas is based on tumour size, location, depth, grade and presence or absence of metastases.[1,2,13]

In this study the age ranged from 1-75 years comparable to a study conducted by Sharma *et al*[9] in India in 2015 with an age range of 3–73 years. The gender ratio in this study was 1.13:1coparable to the same study with ratio of 1.4:1, other studies by Agravat *et al*[8] 2010 in Rajkot and Jain *et al*[5] 2014 in India show gender ratio as 1.1:1 and 1.2:1 respectively.

In this study most of the benign soft tissue tumours 49 (27.84%) occurred in the age group of 21–30 years followed by 11–20 years 37 (21.02%), 1–10 years 27 (15.34%) cases. In study conducted by Sharma *et al*[9] 2015 in India benign tumours were more common in the age groups of 31–40 years 32 (18.82%) followed by 41–50 years 29 (17.05%) and 21–30 years 24 (14.11%) cases. In a study conducted by Batra *et al*[6], in India benign tumours were common in the age group of 21–50 years (61.8%) and malignant tumours were common in the age group of 51–70 years (41.1%) cases.

In this study benign tumours were 176 (65.91%) and malignant tumours 91 (34.08%). In a study conducted by Makino *et al*[10] show 55% benign tumours and 45% malignant tumours. Petersen *et al*[11] also show 35% benign tumours, 49% malignant tumours and 11.4% borderline tumours. In the study by Batra *et al*[6] out of 157 total soft tissue tumours benign tumours cases were 140 (89.17%) and malignant tumours were 17 (10.82%) cases.

Sharma *et al*[9] recorded majority cases as benign 150 (88.2%) with 3 (1.8%) borderline and 17 (10%) malignant cases. Jain *et al*[5] also show that out of total 370 soft tissues tumours 90.6% were benign and 9.4% were malignant.

This gross difference in benign and malignant tumour percentages may be due to non-removal of benign tumours especially lipoma in this region as observed in usual clinical practice. Also in laboratories where malignant tumours ratio is higher than benign soft tissues tumours may be for the reason that these places work as referral laboratories where immunohistochemistry availability dominates malignant cases versus benign cases. So to estimate the relative frequency of benign to malignant soft tissue tumours accurately may be difficulty since many of the benign tumours are ignored and patients do not report to the clinicians for removal.

In this study haemangioma (27.3%) was the most common benign tumour followed by lipoma (15.35%). In a study conducted by Hassawi *et al*[15] in Mosul in 2010 haemangioma was 22 (23.65%) as the commonest tumour followed by lipoma 20 (21.50%) and neuronal tumours 8 (8.60%) having the same order of sequence as in our study. In the Agravat *et al*[8] study, lipoma was the commonest tumour followed by haemangioma 32% and 22% respectively. In the Batra *et al*[6] study lipoma 92 (65.7%) was the commonest tumour followed by neuro-fibroma 22 (15.7%). In the study by Janaki *et al*[7] in Nandyal lipoma 79 (37.7%) was commonest tumour followed by haemangioma 54 (25.71%). The Sharma *et al*[9] study showed lipoma 51 (30%) as the commonest tumour followed by neuronal tumours 44 (25.88%). Amongst all these above studies except the one conducted by Hassawi *et al*[15] have the same order of sequence as in our study whereas all other studies show lipoma as the commonest tumour. The reason is that in our set up most of the benign tumours especially lipomas are not excised if the tumour is not disfiguring.

In our study amongst the malignant tumours rhabdomyosarcoma 35 (13.1%) is the commonest tumour followed by angiosarcoma 14 (5.2%), malignant fibrous histiocytoma (MFH) 12 (4.5%) cases and fibro sarcoma and malignant peripheral nerve sheath tumour (MPNST) 6 (2.2%) and 5 (1.9%) cases respectively.

In the Hassawi *et al*[15] study rhabdomyosarcoma was found in 11 (11.82%) cases followed by Primitive Neuro Ectodermal Tumour (PNET) 6 (6.455), liposarcoma 3 (3.22%) and malignant fibrous histiocytoma 2 (2.15%) cases. In the study by Batra *et al*[6] malignant spindle cell neoplasm, malignant fibrous histiocytoma and liposarcoma 3 (17.6%) cases each were found.

In other studies conducted by different authors at different places show different frequencies of the malignant soft tissues tumours. The reason is that soft tissue sarcomas on H&E staining have gross subjective differences as final categorization needs immune markers decision as immune marker plays a major role in differential diagnosis of most soft tissue sarcomas.

CONCLUSION

Haemangioma instead of lipoma is the commonest benign soft tissue tumour and rhabdomyosarcoma is the commonest malignant tumour as findings of this study.

AUTHOR'S CONTRIBUTION

All the authors contributed equally.

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