International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2022; 5(4): 13-20
Received: 10-07-2022
Accepted: 16-08-2022

Dr. Shuchi Patel
Senior Resident, Department of pathology, B. J. Medical college & Civil Hospital, Gujarat University, Ahmedabad, Gujarat, India

Dr. Smita Shah
Professor, Department of pathology, B. J. Medical college & Civil Hospital, Gujarat University, Ahmedabad, Gujarat, India

Dr. Hansa Goswami
Professor and Head, Department of pathology, B. J. Medical college & Civil Hospital, Gujarat University, Ahmedabad, Gujarat, India

Corresponding Author:
Dr. Shuchi Patel
Senior Resident, Department of pathology, B. J. Medical college & Civil Hospital, Gujarat University, Ahmedabad, Gujarat, India

Clinico-histopathological evaluation of spindle cell soft tissue tumours

Dr. Shuchi Patel, Dr. Smita Shah and Dr. Hansa Goswami

DOI: https://doi.org/10.33545/pathol.2022.v5.i4a.487

Abstract
Introduction: Spindle cells are of mesenchymal origin and part of connective tissue. Soft tissues defined as non-epithelial, extra skeletal tissues of the body that may be voluntary muscles, fat and fibrous tissue and vessels. Soft tissue tumours are defined as mesenchymal proliferation which occur in the extraskeletal nonepithelial tissues of the body, excluding the viscera, coverings of brain and lymphoreticular system.
Aims: The aims of the study is to classify according to WHO, evaluate the incidence rate and age, sex, site wise distribution and histopathological findings of the various types of spindle cell soft tissue tumours and comparing it with national and international study.
Materials and Methods: The present study was done on surgical specimens received in Department of Pathology from August 2019 to August 2021. The Autolysed, poorly preserved specimens were excluded from the study. The specimens were fixed, grossly examined, representative tissue bits taken, processed in automated tissue processor for routine paraffin embedding, Tissue sectioning by microtomy and staining with the routine hematoxylin and eosin method done. Special stains were used if necessary. The microscopic examination was done and the results were analysed.
Results: Out of 110 cases of spindle cell soft tissue tumors, most common tumors were Peripheral nerve sheath tumours (34.5%) followed by Fibroblastic and myofibroblastic tumours (22.7%). Most of the cases in present study occur between 21-30 years of age and more common in males. Higher rates of tumours located in head and neck region (36.4%).
Conclusion: Spindle cell soft tissue tumours are classified according to morphological and histogenetic basis. Definite diagnosis especially for difficult cases should be made by performing immunohistochemistry and molecular biology. Present study was unique on the basis of that it includes spindle cell soft tissue tumours.

Keywords: Spindle cell, fibrohistiocytic, pericytic, nerve sheath

Introduction

In the present study, a diverse and fascinating group of spindle cell tumours that arises from the supporting soft tissue of the body was discussed.
Spindle cells are of mesenchymal origin and constitute a part of the body's connective tissue. They are specialized cells that are longer than they are wide. The most common type of normal spindle cell is called a fibroblast. On histologic examination, these cells appear elongated with a fusiform or ovoid nucleus. The tissue of origin can be determined based on evidence of collagen, cartilage, bone, fat or myxomatous material formed by the tumour cells. The tissue of origin can determine the biologic potential of the lesions.
Soft tissues defined as non-epithelial, extra skeletal tissues of the body with exclusion of reticulo-endothelial system, glia and supporting tissues of various parenchymal organs. It is represented by voluntary muscles, fat and fibrous tissue along with the vessels serving these tissues. Tumours of peripheral nerve, the components of which are derived from the neuroectoderm are also included because of their frequent occurrence in the superficial soft tissues [1].
Soft tissue tumours are defined as mesenchymal proliferation which occur in the extraskeletal nonepithelial tissues of the body, excluding the viscera, coverings of brain and lymphoreticular system.
Perhaps in no other field of diagnostic pathology has there been such a proliferation of newly described histologic entities as there has been in the area of soft tissue pathology within past 10 years. The students of pathology are now faced with a host of diagnostic entities that

number well over 100 and for which there are about 300 synonyms. However, many are so rare that they fall outside of experience not only for most general physicians but also for the pathologists.

It is the rarity of these tumours that creates both their fascination and their problem. The wide variation in their histopathological patterns extends the pathologist's diagnostic ability to the limit. In fact many lesions that appear and being diagnosed as sarcomas are in fact benign reactive proliferative lesions.

Materials and Methods

An observational study of soft tissue tumours carried out at Pathology Department of tertiary care teaching Hospital, Ahmedabad during the period of 2 years, from August 2019 to August 2021. 110 cases were included for the study.

Subject Selection

- **Inclusion criteria:** The material for the study consisted of all the biopsies, specimens and referred materials submitted to the department of pathology in B.J. Medical College Ahmedabad for a period from August 2019 to August 2021 with 110 cases.
- **Exclusion criteria:** Autolysed, poorly preserved specimens were excluded.

Method

Detail clinical history and radiological findings collected from case paper and request form, after collecting sample cuts were kept at 1 cm apart if tissue is large and kept in 10% neutral buffered formalin for 24 hrs. Four mm thick sections were taken from presentative area after fixation. Tissues were processed in Leica automated Tissue processor using formalin, acetone, xylene, paraffin. Blocks were prepared and sections were cut (approximately 4-5 micron thick), the sections were taken on pretreated slide with egg albumin. H & E stain were carried out. Special stains were carried as and when required (PAS, Reticulin). Microscopic examination was carried out and result was recorded by two different histopathologists. Result were analysed using MS Excel. The data were recorded and classified according to age, sex, site and behaviour so on.

Results

A total of 110 cases were diagnosed and included in the study as spindle cell soft tissue tumours, from 15297 biopsies received in the period from August 2019 to August 2021 in Pathology Department. Thus, incidence of spindle cell soft tissue tumour was 0.7%.

Table 1: Age, Sex and Histological behaviour wise distribution

Age (years)	Benign		Intermediate		Malignant		Total		Total	Percentage
	M	F	M	F	M	F	M	F		
0-10	1	0	1	2	4	1	6	3	9	8.2%
11-20	5	2	1	3	0	1	6	6	12	10.9%
21-30	11	10	1	1	2	1	14	12	26	23.6%
31-40	6	4	1	0	2	1	9	5	14	12.7%
41-50	9	4	3	1	2	0	14	5	19	17.3%
51-60	2	7	3	0	4	1	9	8	17	15.5%
61-70	4	3	0	1	2	0	6	4	10	9.1%
71-80	1	1	0	0	0	1	1	2	3	2.7%
Total	39	31	10	8	16	6	65	45	110	100%

In Table 1, Overall soft tissue tumour was most common in 3rd decade (23.6%) followed by 5th decade (17.3%). The age ranges for benign tumour was from 9 to 78 years. For Intermediate categories tumour, age range was from 0 to 67 years with maximum cases in 5th decade followed by 6th decade. While age ranges for malignant tumour was from 5 to 72 years with maximum cases in 6th decade followed by 3rd decade.

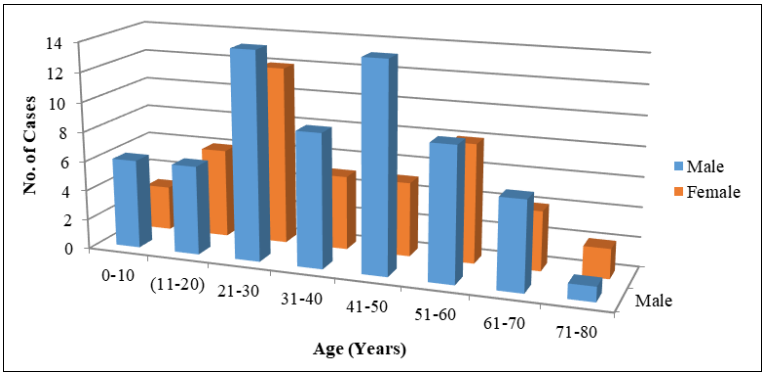

Chart 1: Age-Sex wise distribution of Total Tumours

Out of 110 cases male to female ratio was 1.4:1.

Table 2: Site wise Distribution of cases

Site of origin	No. of cases	Percentage
Extremities	24	21.8%
Head & Neck	40	36.4%

Back & Shoulder	8	7.3%
Trunk	32	29%
Others	6	5.5%
Total	110	100

Table 2. shows that Head & Neck was the most common site to be affected (36.4%) followed by Trunk (29%).

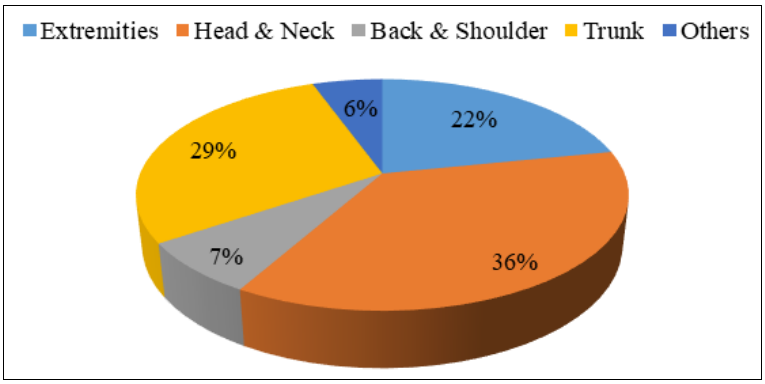

Chart 2: Site wise distribution

Table 3: Histological type wise distribution of spindle cell soft tissue tumours

Histological typing	No. of cases	Percentage
Adipocytic tumours	7	6.4%
Fibroblastic and myofibroblastic tumours	25	22.7%
Fibrohistiocytic tumours	7	6.4%
Vascular tumours	3	2.7%
Pericytic (Perivascular) tumours	1	0.9%
Smooth muscle tumours	7	6.4%
Skeletal muscle tumours	4	3.6%
GIST	8	7.3%
Peripheral nerve sheath tumours	38	34.5%
Tumours of uncertain differentiation	10	9.1%
Total	110	100%

Table 3. Shows that Peripheral nerve sheath tumours were most common (34.5%) while Pericytic (perivascular) tumours were least common (0.9%).

Table 4: Histological Behaviour

Histological behavior	No. of case	Percentage
Benign	70	63.6%
Intermediate	18	16.4%
Malignant	22	20%
Total	110	100%

Table 4. shows benign tumours (63.6%) were more common than intermediate (16.4%) and malignant (20%) tumours.

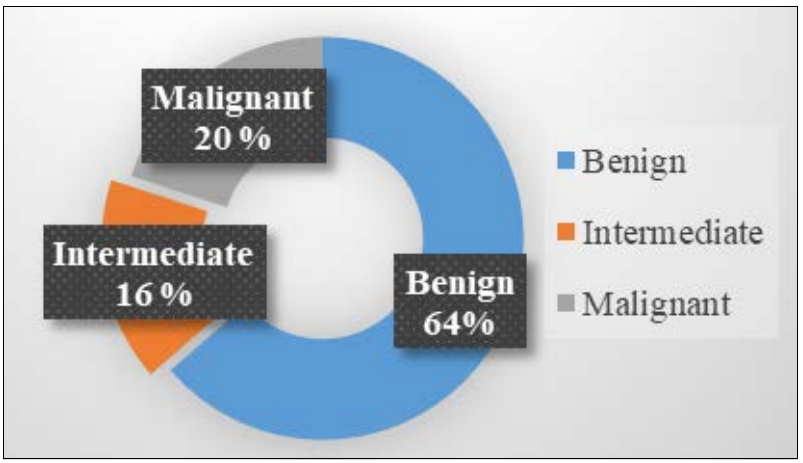

Chart 3: Histological behavior

Table 5: Clinical presentation of Spindle cell soft tissue tumours

Clinical presentation	No. of cases (n=110)	Percentage
Swelling	67	60.9%
Pain	21	19.1%
Weakness and other CNS related symptoms	19	17.3%
Other presentation	13	11.8%

Most common clinical presentation in spindle cell soft tissue tumour in present study was swelling in 67 cases out of 110 cases followed by pain, Weakness and other CNS related symptoms and other clinical presentation like bleeding, difficulty in swallowing and breathing.

Table 6: Size and plane of involving wise distribution of Spindle cell soft tissue tumours

Size	Superficial	Deep seated	Total	Percentage of
<5 cm	40	34	74	67.3%
>5 cm	13	23	36	32.7%
Total	53	57	110	100%

Out of 110 received spindle cell soft tissue tumours, most of tumours size were <5 cm (67.3%) with most common superficial plane of involving.

Table 7: Histological behavior wise distribution of Spindle cell soft tissue tumour

No	Classification of tumor	Category of tumours	Total cases	Percentage
1	Adipocytic tumor		7	6.4%
	Spindle cell Lipoma	Benign	5	4.54%
	Pleomorphic lipoma	Benign	1	0.91%
	Atypical lipomatous tumour/ Well differentiated liposarcoma	Intermediate (locally aggressive)	1	0.91%
2	Fibroblastic and Myofibroblastic tumour		25	22.7%
	Fibroma of tendon sheath	Benign	2	1.8%
	Angiomyofibroblastoma	Benign	1	0.9%
	Angiofibroma	Benign	2	1.8%
	Solitary fibrous tumour, benign	Intermediate	1	0.9%
	Lipofibromatosis	Intermediate	1	0.9%
	Extra-abdominal desmoid	Intermediate	3	2.8%
	Inflammatory myofibroblastic tumour	Intermediate	4	3.6%
	DFSP	Intermediate	3	2.8%
	Low grade fibromyxoid sarcoma	Malignant	4	3.6%
	Solitary fibrous tumour, malignant	Malignant	4	3.6%
3	Fibrohistiocytic Tumours		7	6.4%
	Benign fibrous histiocytoma	Benign	7	6.4%
4	Vascular tumours		3	2.7%
	Hemangioendothelioma	Intermediate	2	1.8%
	Low grade angiosarcoma	Malignant	1	0.9%
5	Pericytic (perivascular) Tumours		1	0.9%
	Angioleiomyoma	Benign	1	0.9%
6	Smooth muscle tumours		7	6.4%
	Leiomyoma	Benign	7	6.4%
7	Skeletal muscle tumours		4	3.6%
	Embryonal rhabdomyosarcoma	Malignant	4	3.6%
8	Gastrointestinal Stromal Tumour		8	7.3%
9	Peripheral Nerve Sheath Tumours		38	34.5%
	Schwannoma	Benign	12	10.9%
	Neurofibroma	Benign	23	20.9%
	Malignant peripheral nerve sheath tumour	Malignant	3	2.7%
10	Tumours of uncertain differentiation		10	9.1%
	Angiomyolipoma	Intermediate	3	2.73%
	Myoepithelioma	Intermediate	2	1.82%
	Clear cell sarcoma	Malignant	2	1.82%
	Malignant myoepithelioma	Malignant	1	0.91%
	Undifferentiated pleomorphic sarcoma	Malignant	2	1.82%
Total			110	100%

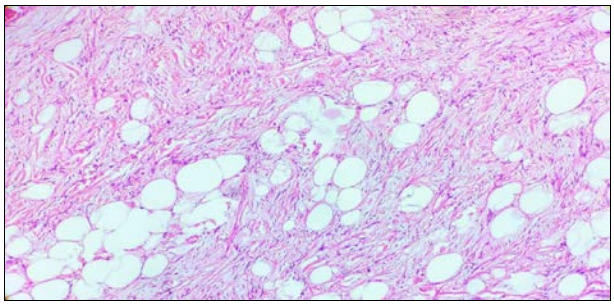

Fig 1: Spindle cell lipoma

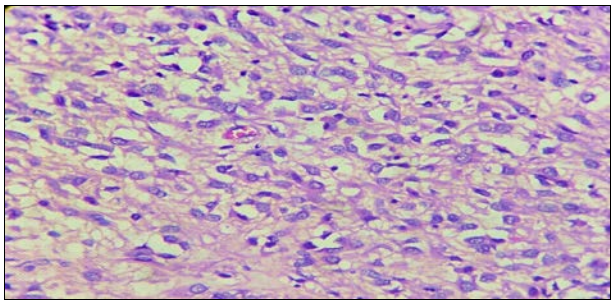

Fig 2: Inflammatory myofibroblastic tumour (40X)

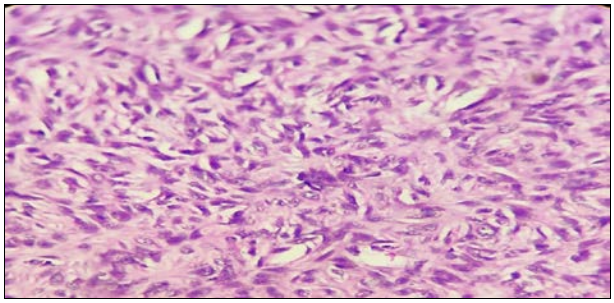

Fig 3: Benign fibrous histiocytoma (40X)

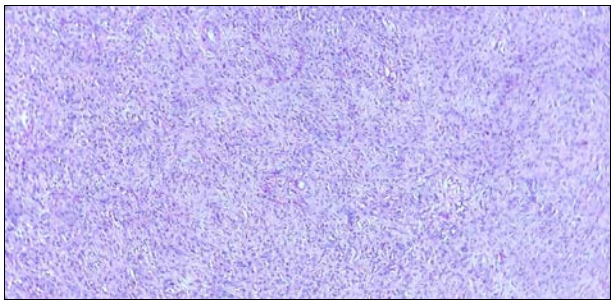

Fig 4: Hemangioendothelioma (10X)

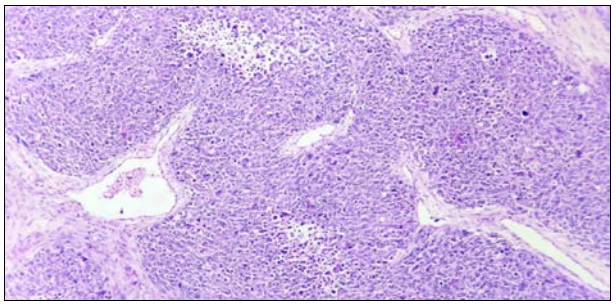

Fig 5: Embryonal Rhabdomyosarcoma (10X)

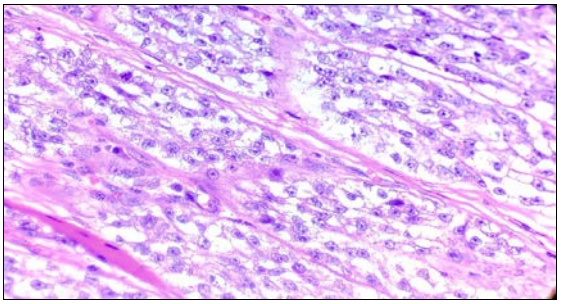

Fig 6: Clear cell sarcoma (40X)

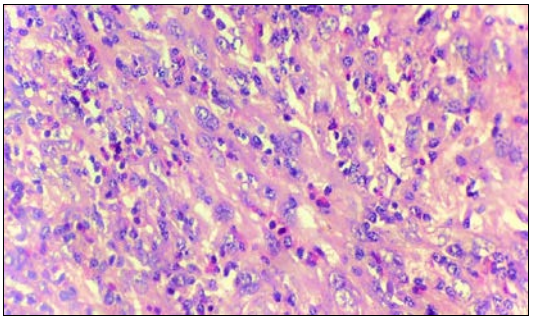

Fig 7: Pleomorphic sarcoma (40X)

Discussion

All the 110 cases were studied in detail and results were compared with studies of other authors on soft tissue tumours. In the present study, 110 cases were diagnosed as spindle cell soft tissue tumours. Of 15297 biopsies received in the period from August 2019 to August 2021 in Pathology Department, B.J Medical College & Hospital, Ahmedabad.

Table 8: Distribution according to histological behaviour

Author	Year of study	Benign%	Intermediate%	Malignant%
Singh, *et al.*[2]	2009-2013	67%	19%	25.9%
Jobanputra G.P. *et al.*[3]	2014-2015	89.3%	1.4%	9.3%
Umarani MK *et al.* [4]	2015	92.73%	2.27%	5%
Patel A, Patel VN [5]	2018	92.4%	1.18%	5.88%
Present study	2019-21	63.6%	16.4%	20%

In the present study on spindle cell soft tissue tumours, from total cases benign cases were 63.6%, intermediate category cases were 16.4% and malignant were 20%, which co-relates with Singh, *et al*. study on only soft tissue tumours in which benign were 67%, intermediate were 19% and malignant were 25.9%.

Table 9: Distribution according to age group

Age (years)	Baig MA 2015 [6]	Patel A, Patel VN 2018 [5]	Present study 2021
0-10	12	7	9
11-20	22	12	12

21-30	28	34	26
31-40	32	24	14
41-50	20	45	19
51-60	16	23	17
61-70	5	14	10
71-80	2	11	3
Total cases	137	170	110

In present study on spindle cell soft tissue tumour, most common age group involved was 21-30 years of age while in Baig MA study on soft tissue tumours it was 31-40 years and in Patel A *et al*. study it was 41-50 years. In study of soft tissue, tumours were distributed 2nd to 6th decade, which was compared with present study on spindle cell soft tissue tumour in which they were distributed in same range decade.

Table 10: Sex wise distribution of the cases

Author	Year of study	Total cases	Males	Females	M:F
Singh, *et al*.[2]	2009-2013	270	149	121	1.23:1
Jemal *et al*.[7]	2007	9220	5050	4170	1.2:1
Present study	2019-21	110	65	45	1.45:1

In present study of spindle cell soft tissue tumour, most commonly involves male, which was compared with other study on soft tissue by Jemal *et al*. and Singh, *et al*.

Table 11: Site wise distribution of the cases

Authors	Year of study	Extremities	Head & Neck	Trunk	Others (Back, shoulder, retroperitoneum)	Total cases
Singh, *et al*.	2009-2013	43.4%	22.9%	22.2%	11.5%	270
Baig MA	2004-2007	41.6%	26.3%	23.4%	8.7%	137
Present study	2019-21	21.8%	36.4%	29%	12.8%	110

In the present study on spindle cell soft tissue tumour, head & neck were the most common site of occurrence, which was 36.4%.

Table 12: Histological type wise distribution of the cases

Histological type	Present study 2021	Jobanputra G.P. *et al*. 2016 [3]	Baig MA 2015 [6]	Patel A, Patel VN 2018 [5]
Adipocytic tumours	7	40	55	115
Fibroblastic and myofibroblastic tumours	25	11	20	5
Fibrohistiocytic tumours	7	-	9	8
Vascular tumours	3	24	22	19
Pericytic (Perivascular) tumours	1	2	3	-
Smooth muscle tumours	7	30	3	2
Skeletal muscle tumours	4	2	-	0
GIST	8	4	-	-
Peripheral nerve sheath tumours	38	25	9	12
Tumours of Uncertain differentiation	10	-	-	1
Total cases	110	140	137	170

In present study on spindle cell soft tissue tumours, most common histological type was peripheral nerve sheath tumour while other study on soft tissue tumour most common histological type was adipocytic tumours.

In present study of spindle cell lipoma was common in adipocytic tumour which was common in 41-50 years of age with M: F=4:1 which was compared with Enzinger *et al*. study on spindle cell lipoma.[8]Atypical lipomatous tumour that involving thigh in present study and occur in 41-50 years of age group [9].

In fibroblastic and myofibroblastic spindle cell tumour of malignant category, fibromyxoid sarcoma was common occur in 5th decade and all cases with male preponderance [10].

In so called fibrohistiocytic tumour, benign fibrous histiocytoma was commonly found and it involves extremities and head neck equally (42.85%). Commonly occurring in male (5 cases out of 7) and with wide range of distribution (17-47 years) which was compared with Fletcher CD [11] study of fibrous histiocytoma in which most common site was extremities followed by head & neck with wide range of distribution.

Angioleiomyoma was benign pericytic (perivascular) spindle cell soft tissue tumour in present study involves extremities in 5th decade of male which was compared it with study by Hachisuga *et al*. and it suggest same [12].

In present study on spindle cell smooth muscle soft tissue tumours, leiomyoma was most commonly found that involves trunk in majority of cases and occur in 2nd and 7th decade with equally distributed in male and female.

All cases of Malignant spindle cell skeletal muscle soft tissue tumour in present study was embryonal rhabdomyosarcoma which was present in 75% of male in 1st decade involving head and neck region. Skapek *et al*. study on rhabdomyosarcoma suggest the same [13].

Gastrointestinal stromal tumours in present study occurs jejunum and ileum with most commonly involves 3rd and 6th decade. GIST most commonly occurs in female with M: F -

1:1.6.

Benign peripheral nerve sheath tumour was more common than malignant peripheral nerve sheath tumour. In present study Benign PNST occur most commonly head & neck followed by extremities that was similar to study by Gabhane *et al*. [14] Mean age in Gabhane *et al*. study was 31.57 years for benign PNST and that was similar to present study in which most common age distribution was 21-30 years (14 cases out of 35).

Tumour of uncertain differentiation are benign, intermediate or malignant soft tissue tumour in which the line of cellular differentiation is unclear. In some tumours (e.g. mixed tumours, synovial and clear cell sarcoma), a line of differentiation can be identified but a cellular counterpart of the tumour cannot be defined in normal mesenchymal tissues.

In the past, these tumours are also labelled as being "of uncertain origin." In view of the knowledge that these tumours do not arise from their normal cellular counterparts, the former classification based on "histiogenetic" concepts is no longer valuable. The current classification is based on terms of "differentiation," which depends on patterns of gene expression. This differentiation is predominantly based on their local growth pattern and clinical behavior, because of their often still unclear line of cell differentiation [15].

Angiomyolipoma in present study 3 cases found out of which 2 were female of middle aged. It was compared with Folpe L *et al*. [16].

Myoepithelioma in study mostly occurs before 2nd decade and involves head and neck region most commonly.

Clear cell sarcoma of spindle cell tumour of uncertain differentiation in present study involves 21-40 years of age group which was correlate with Chung *et al*. study on clear cell sarcoma suggest peak incidence in third and fourth decade of life [17].

Undifferentiated pleomorphic sarcoma which was now malignant category of tumour of uncertain differentiation in present study, all 3 cases found in extremities which was correlated with Robles-Tenorio *et al*. study [18] on sarcoma with higher occurrence in male.

Conclusion

Spindle cell soft tissue tumours are classified according to morphological and histogenetic basis. Definite diagnosis especially for difficult cases should be made by performing immunohistochemistry and molecular biology. Present study was unique on the basis of that it includes spindle cell soft tissue tumours while other studies were on basis of broad category of soft tissue tumours.

Acknowledgement

I would like to express my special thanks to patients, my teachers Dr Smita Shah and Dr Hansa Goswami, colleagues and staff members of Department of pathology, BJMC, Ahmedabad. There is no conflicts of interest by authors of this publication.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Biology RRJ of C. undefined. The smooth muscle cell II. Growth of smooth muscle in culture and formation of elastic fibers. rupress.org [Internet] [cited 2021 Nov 30]; Available from: https://rupress.org/jcb/article/50/1/172/17725
2. Singh H, Grover S, Garg B, journal NSN medical. Undefined. Histopathological spectrum of soft-tissue tumors with immunohistochemistry correlation and FNCLCC grading: A North Indian Experience. ncbi.nlm.nih.gov [Internet] [cited 2021 Nov 19]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6552737/
3. Jobanputra G, Parikh U. Current HGIJ of undefined. Histopathological Study Of Soft Tissue Tumors (A Study Of 140 Cases) In Tertiary Care Center. ijcrr.com [Internet]; 2016 [cited 2021 Nov 19]; Available from: http://www.ijcrr.com/uploads/186_pdf.pdf
4. Umarani M, Lakra P, Sci MBIJDM. undefined. Histopathological spectrum of soft tissue tumors in a teaching hospital; 2015. Citeseer [Internet] [cited 2021 Nov 19]; Available from: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1085.8149&rep=rep1&type=pdf
5. Patel A, Professor A. Study of frequency and histopathological pattern of soft tissue tumours in tertiary care centre of Gandhinagar, Gujarat. pdfs.semanticscholar.org [Internet] 2019 [cited 2021 Nov 26];(1). Available from: https://pdfs.semanticscholar.org/1620/4c471ca18072ae6361d023c8a9d14a7663d3.pdf
6. Baig MA. Histopathological study of soft tissue.. - Google Scholar [Internet]. [cited 2021 Nov 18]; 2015. Available from: https://scholar.google.co.in/scholar?hl=en&as_sdt=0%2C5&q=Baig%2C+MA.+2015.+Histopathological+study+of+soft+tissue++tumours+%28three+years+study%29.+International+Journal+of++Science+and+Research%2C+4%286%29%3A1039-1049.&btnG=#d=gs_cit&u=%2Fscholar%3Fq%3Dinfo%3AZAY7PTPTJZUJ%3Ascholar.google.com%2F%26output%3Dcite%26scirp%3D0%26hl%3Den
7. Jemal A, Siegel R, Ward E, Murray T, Xu J, Thun MJ. Cancer Statistics, CA Cancer J Clin. 2007;57(1):43-66.
8. Enzinger and Weiss's Soft Tissue Tumors - Sharon W. Weiss, John R. Goldblum, Andrew L. Folpe - Google Books [Internet]. [cited 2021 Nov 19];Available from: https://books.google.co.in/books?hl=en&lr=&id=8zIuQzik8WAC&oi=fnd&pg=PT2&ots=ejv1R8OiXy&sig=2atKWjZ4wIzq3LeC6EHixxfSd5M&redir_esc=y#v=onepage&q&f=false
9. Soft tissue and bone tumours. WHO Classification.. - Google Scholar [Internet]. [cited 2021 Nov 19]; Available from: https://scholar.google.co.in/scholar?hl=en&as_sdt=0%2C5&q=Soft+tissue+and+bone+tumours.+WHO+Classification+of+tumours+Number+of+pages7+Place+of+PublicationLyon+PublisherInternational+Agency+for+Research+on+Cancer+Publication+date1+Jan+2020+Edition5.+ed.+Pages403-409+ISBN+%28Print%299789283245025+ISBN+%28Electronic%299789283245032+Publication+statusPublished+-+1+Jan+2020+MoE+publication+typeA3+Book+chapter&btnG=
10. Mentzel T, Dry S. DKTA journal of, 1998 undefined. Low-grade myofibroblastic sarcoma: analysis of 18

cases in the spectrum of myofibroblastic tumors. journals.lww.com [Internet] [cited 2021 Nov 19]; Available from: https://journals.lww.com/ajsp/fulltext/1998/10000/low_grade_myofibroblastic_sarcoma__analysis_of_18.8.aspx
11. Pathology CFTA journal of surgical, undefined. Benign fibrous histiocytoma of subcutaneous and deep soft tissue: a clinic pathologic analysis of 21 cases. europepmc.org [Internet] [cited 2021 Nov 19]; 1990. Available from: https://europepmc.org/article/med/2167613
12. Hachisuga T, Hashimoto H, Cancer ME. Undefined. Angioleiomyoma. A clinicopathologic reappraisal of 562 cases. Wiley Online Library [Internet] [cited 2021 Nov 19]; 1984. Available from: https://acsjournals.onlinelibrary.wiley.com/doi/abs/10.1002/1097-0142(19840701)54:1%3C126::AID-CNCR2820540125%3E3.0.CO;2-F
13. Skapek S, Ferrari A, Gupta A. PLNR, undefined. Rhabdomyosarcoma. nature.com [Internet] [cited 2021 Nov 19]; 2019. Available from: https://www.nature.com/articles/s41572-018-0051-2
14. Gabhane S, Kotwal M. Pathology SBIJ of undefined. Morphological spectrum of peripheral nerve sheath tumors: a series of 126 cases. ijpmonline.org [Internet] [cited 2021 Nov 19]; 2009. Available from: https://www.ijpmonline.org/article.asp?issn=0377-4929;year=2009;volume=52;issue=1;spage=29;epage=33;aulast=Gabhane
15. David Sprengel S, Weber MA, Degryse HR, Vanhoenacker FM. Tumors of Uncertain Differentiation. Imaging of Soft Tissue Tumors [Internet] 2017 [cited 2021 Nov 24]; 425–82. Available from: https://link.springer.com/chapter/10.1007/978-3-319-46679-8_18
16. Folpe A, Mentzel T, Lehr H. CFTA journal, undefined. Perivascular epithelioid cell neoplasms of soft tissue and gynecologic origin: a clinicopathologic study of 26 cases and review of the literature. journals.lww.com [Internet] [cited 2021 Nov 27]; 2005. Available from: https://journals.lww.com/ajsp/Fulltext/2005/12000/The_Spleen_in_the_Wiskott_Aldrich_Syndrome_.2.aspx
17. Chung E. surgical FETA journal of undefined. Malignant melanoma of soft parts. A reassessment of clear cell sarcoma. europepmc.org [Internet] [cited 2021 Nov 19]; 1983. Available from: https://europepmc.org/article/med/6614306
18. Robles-Tenorio A, Solis-Ledesma G. Undifferentiated Pleomorphic Sarcoma. StatPearls [Internet] 2021 [cited 2021 Nov 19]; Available from: https://www.ncbi.nlm.nih.gov/books/NBK570612/

How to Cite This Article
Patel S, Shah S, Goswami H. Clinico-histopathological evaluation of spindle cell soft tissue tumours. International Journal of Clinical and Diagnostic Pathology. 2022;5(4):13-20.