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Impact of Clinicopathological Factors of Extremities, Visceral, Retroperitoneal Sarcoma on Treatment Outcome, Experience from Two Egyptian Institutes

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ABSTRACT

Background: Less than 1% of all adult malignancies and 12% of pediatric cancers are sarcomas, an uncommon and diverse category of mesenchymal malignant tumors. The histologic subtype of soft tissue sarcoma (STS), in addition to the tumors, location, and grade, is a key prognostic factor currently, among the most popular therapies for STSs include surgery, radiation, and chemotherapy.

Objective: The goal of this paper is to determine soft tissue sarcoma's epidemiology and prognostic markers retrospectively. It also shows the outcomes for overall survival (OS) and event-free survival (EFS) among Egyptian patients treated at the clinical oncology and nuclear medicine department of Zagazig University and Ahmad Maher Teaching hospitals.

Patient and Methods: We reviewed retrospectively clinical features and tumor characteristics of the medical record of 121 patients with soft tissue sarcoma presented to Ahmed Maher teaching hospital and clinical oncology and Nuclear Medicine Department of Zagazig University in the period from January 2010 to December 2021 received chemotherapy or chemoradiotherapy, the study group's demographic information included sex, age, follow-up time, and gender, the main tumor site, size, histological subtype, grade, clinical group, and risk stratification were reviewed as tumor features, to assess the degree of tumor resection or elimination, surgical reports, pathology reports, and tumor response to treatment.

Conclusion: Overall survival (OS) is better in extremities than retroperitoneal sarcoma, local recurrence-free survival (LRFS) was better in extremities and visceral sarcoma, disease-free survival (DFS) was better in extremities than retroperitoneal which was better than visceral sarcoma and progression-free survival (PFS) was better in extremities than visceral sarcoma.

Keywords: STS, EFS, PFS, OS, DMFS.

INTRODUCTION

All ages are affected by sarcomas, which are mesenchymal malignancies that arise in embryonic mesenchyme tissues during the process of differentiation. Soft tissue sarcomas (STS) account for one percent of all malignant tumors [1].

In the US, there were 13,190 new cases of soft tissue sarcoma and 5,130 fatalities recorded in 2022 [2]. Each year, there were 3.5 new instances of soft tissue cancer for every 100,000 men and women globally, according to the published incidence rates, which vary from 1.8 to 5 per 100,000 persons [3].

The yearly death rate for both men and women was 1.3 per 100,000. These figures are age-adjusted and based on incidents from 2014 to 2018 and fatalities from 2015 to 2019 [4].

The majority of soft tissue sarcomas (STs) develop in the extremities, and their local treatment requires a multidisciplinary approach that may require either large surgical excision alone or in conjunction with radiation [6]. Sarcomas are traditionally divided by histology and primary site into bone versus soft tissue sarcoma (STs)[5].

A computed tomography (CT) scan or magnetic resonance imaging (MRI) of the main tumor should be performed to assess its size and assess any potential involvement of crucial organ structures. Patients with sarcoma may initially present with an asymptomatic mass or with signs and sympathies related to the main tumor location, the mass effect, or tumor-related consequences [7].

Obtaining sufficient tissue for histology and immunohistochemistry is crucial for a correct diagnosis [8]. The recommended course of treatment for localized high-grade extremity soft tissue sarcoma (ESTS) is large-in-bloc resection combined with radiation therapy (RT).

Adjuvant RT may not always be required in situations of superficial, low-grade, and small-size STS [9], Contrary to surgery and radiation, which focus on local tumor control, the purpose of chemotherapy is systemic control, which may be therapeutic, adjuvant, or palliative [10]. Cyclophosphamide, ifosfamide, vincristine, doxorubicin, dactinomycin, and etoposide are among the medications used to treat patients with these malignancies [11].

The goal of this paper is to determine soft tissue sarcoma's epidemiology and prognostic markers retrospectively.

It also shows the outcomes for overall survival (OS) and event-free survival (EFS) among Egyptian patients treated at the clinical oncology and nuclear medicine department of Zagazig University and Ahmad Maher Teaching hospitals.

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PATIENTS AND METHODS

Site of study: Department of Clinical Oncology and Nuclear Medicine Zagazig University and Department of Clinical Oncology Ahmed Maher Teaching Hospital.

Sample size: Sample size comprehensive sample include all available archived data about 121 patient
Type of the study: Retrospective study.

Subject:
Inclusion criteria: All medical record of extremities sarcoma, visceral and retroperitoneal was included.

Operational design:

We collected the following data: age, tumor laterality, site of the tumor, pathological type, tumor grade, T, N, type of systemic therapy delivered, and details of radiotherapy. Locoregional recurrence is defined as a first recurrence.

Local Recurrence Free Survival (LRFS) was calculated as the time from the date of surgery to the date of local recurrence or the most recent follow-up contact that the patient was known as local recurrence-free. Locoregional Recurrence Free Survival (LRRFS) was calculated as the time from the date of surgery to the date of local or/and regional recurrence or the most recent follow-up contact that the patient was known as locoregional recurrence-free. Overall Survival (OS) was calculated as the time from diagnosis to death or the most recent follow-up contact (censored).

Ethical consent:

The study was authorized by Zagazig University and Ahmed Maher Teaching Hospital Ethical Institutional Review Board. All study participants provided written informed permission after being informed of our research's goals. The Declaration of Helsinki for human beings, which is the international medical association's code of ethics, was followed during the conduct of this study.

Statistical Analysis

Using SPSS 22.0 for Windows and MedCalc 18 for Windows, all data were gathered, tabulated, and statistically evaluated. Continuous The mean (range) was used to represent quantitative variables, while absolute frequencies (number) and relative frequencies were used to convey categorical qualitative variables (percentage). When necessary, the Chi-square test or Fisher's exact test was used to compare categorical data. According to PMRT, survival was stratified. The Kaplan-Meier plot technique was used to estimate these time-to-event distributions, and the two were compared using a two-sided exact log-rank test.

To identify independent variables for locoregional recurrence, univariate and multivariate models were created using Cox proportional-hazards regression analysis (LRR). Every test had two sides. Statistical significance was defined as a P-value of 0.05 or below.

RESULTS

Comparison between extremities, retroperitoneal and visceral sarcomas regarding patient characteristics

A retrospective study conducts by medical records of two Egyptian centers Clinical Oncology and Nuclear Medicine Department of Zagazig University precipitated by seventy-two patients. (59.5%) and Ahmed Maher teaching hospital precipitate by forty-nine patients. (40.5%) and the study includes all patient with soft tissue sarcoma between January 2010 and December 2022 all type of sarcoma was studied and comparison between extremities sarcoma which were about seventy-five patients.

(62%) retroperitoneal sarcoma included nine patients. which were (7.2%) and visceral sarcoma include thirty-seven patients. which were (30.6%) was done, there was a slight overall female predominance they were (52.9%): extremities sarcomas were (53.3%) of them, retroperitoneal sarcoma was (66.7%) of the theme while the visceral male was predominant (51.4%), the median age was 52 years for whole cohort while extremities sarcoma median age was 47years old and 60 years old for retroperitoneal and 57 years old for visceral sarcomas.

Adults constituted were (73.6%) of the total number of all: extremities sarcoma was (78.7%), retroperitoneal sarcoma was (55.6) and visceral sarcoma was (67.6). The most comma clinical presentation for all types was painless soft tissue swelling (92%) but in visceral sarcomas most common was abdominal mass (81.1%) **(Table 2)**.

Table (1): Comparison between extremities, retroperitoneal and visceral sarcomas regarding patient characteristics.

Patient characteristics	All studied patients (N=121)		Extremities Sarcoma (N=75)		Retroperitoneal Sarcoma (N=9)		Visceral Sarcoma (N=37)		p-value
	No.	%	No.	%	No.	%	No.	%	
All patients	121	100%	75	62%	9	7.4%	37	30.6%	--------
Year of diagnosis									
2010	1	0.8%	1	1.3%	0	0%	0	0%	0.846[a]
2011	1	0.8%	0	0%	0	0%	1	2.7%	
2013	1	0.8%	0	0%	0	0%	1	2.7%	
2014	2	1.7%	1	1.3%	0	0%	1	2.7%	
2015	3	2.5%	2	2.7%	1	11.1%	0	0%	
2016	6	5%	3	4%	0	0%	3	8.1%	
2017	15	12.4%	9	12%	1	11.1%	5	13.5%	
2018	29	24%	17	22.7%	3	33.3%	9	24.3%	
2019	23	19%	18	24%	1	11.1%	4	10.8%	
2020	25	20.7%	15	20%	2	22.2%	8	21.6%	
2021	15	12.4%	9	12%	1	11.1%	5	13.5%	
Center									
Ahmad Maher Hospatient ial ZUCOD	49	40.5%	40	53.3%	2	22.2%	7	18.9%	0.001[a]
	72	59.5%	35	46.7%	7	77.8%	30	81.1%	
Sex									
Male	57	47.1%	35	46.7%	3	33.3%	19	51.4%	0.619[a]
Female	64	52.9%	40	53.3%	6	66.7%	18	48.6%	
Age (years)									
Mean±SD	51±15.62		47.97±16.20		58.66±9.79		55.27±14.14		0.014[b]
Median (Range)	52 (18 – 86)		47 (18 – 86)		60 (44 – 70)		57 (23 – 85)		
Age group									
Pediatric	1	0.8%	1	1.3%	0	0%	0	0%	0.367[a]
Adult	89	73.6%	59	78.7%	5	55.6%	25	67.6%	
Elder	31	25.6%	15	20%	4	44.4%	12	32.4%	
Clinical presentation									
Painless soft tissue swelling	92	76%	71	94.7%	6	66.7%	15	40.5%	<0.001[a]
Neurologic abnormalities	1	0.8%	0	0%	0	0%	1	2.7%	0.318[a]
Haematemesis	2	1.7%	0	0%	0	0%	2	5.4%	0.099[a]
Blood in feces	6	5%	0	0%	1	11.1%	5	13.5%	0.006[a]
Vaginal bleeding	7	5.8%	0	0%	0	0%	7	18.9%	<0.001[a]
Lower abdominal pain	16	13.2%	0	0%	5	55.6%	11	29.7%	<0.001[a]
Abdominal mass	37	30.6%	0	0%	7	77.8%	30	81.1%	<0.001[a]
Lower limb edema	14	11.6%	13	17.3%	1	11.1%	0	0%	0.026[a]
Back pain	5	4.1%	0	0%	1	11.1%	4	10.8%	0.014[a]

Categorical variables were expressed as number (percentage); Continuous variables were expressed as mean ± SD & median (range); a: Chi-square test; b: Kruskal Wallis H test; p-value<0.05 is significant.

Comparison between extremities, retroperitoneal and visceral sarcomas regarding tumor characteristics and histopathology:

There was an insignificant difference between several types of sarcoma according to tumor focality: extremities' sarcoma was 90% unifocal while visceral was 78.4 % unifocal and retroperitoneal was 77.8% unifocal, Median tumor size for all types was 10 cm and more common histopathological type was pleomorphic sarcoma were 19% which was more common in extremities, GIST was 19% and more common in visceral sarcoma, fibrosarcoma were 11.6% and more common in extremities, lip sarcoma were 13.2% and more common in retroperitoneal., leiomyosarcoma was 9.1% more common on visceral sarcomas, Grade 2 was most common among all types which were 45.3% in extremities, 43.2% in visceral and 33.3% in retroperitoneal, necrosis was present in 28% of all records mostly among extremities sarcoma was 29.3%, among all records surgical margin was negative in 66.9%: extremities sarcoma were 77%, retroperitoneal sarcoma were 33.3% and visceral sarcoma was 54.8% **(Table 2)**.

Table (2): Comparison between extremities, retroperitoneal and visceral sarcomas regarding tumor characteristics and histopathology.

Tumor characteristics and histopathology	All studied patients (N=121)		Extremities Sarcoma (N=75)		Retroperitoneal Sarcoma (N=9)		Visceral Sarcoma (N=37)		p-value
	No.	%	No.	%	No.	%	No.	%	
Tumor focality									
Unifocal	105	86.8%	69	92%	7	77.8%	29	78.4%	0.096[a]
Multifocal	16	13.2%	6	8%	2	22.2%	8	21.6%	
Max. Tumor size (cm)									
Mean±SD	10.92±6.90		9.60±5.22		12.33±9.04		13.27±8.65		0.061[b]
Median (Range)	10 (2 – 40)		10 (2 – 28)		10 (5 – 32)		10 (4 – 40)		
≤5 cm	17	14%	15	20%	0	0%	2	5.4%	0.015[c]
>5-10 cm	54	44.6%	33	44%	6	66.7%	15	40.5%	
>10-15 cm	30	24.8%	18	24%	1	11.1%	11	29.7%	
>15 cm	20	16.5%	9	12%	2	22.2%	9	24.3%	
Histopathology									
Pleomorphic sarcoma (NOS)	23	19%	22	29.3%	0	0%	1	2.7%	<0.001[a]
Fibrosarcoma	14	11.6%	12	16%	1	11.1%	1	2.7%	
Liposarcoma	16	13.2%	12	16%	4	44.4%	0	0%	
Spindle cell sarcoma	9	7.4%	6	8%	2	22.2%	1	2.7%	
Synovial sarcoma	5	4.1%	5	6.7%	0	0%	0	0%	
Malignant fibrous histiocytoma	2	1.7%	2	2.7%	0	0%	0	0%	
Alveolar soft part sarcoma	1	0.8%	1	1.3%	0	0%	0	0%	
Clear cell sarcoma	1	0.8%	1	1.3%	0	0%	0	0%	
Sarcomatoid carcinoma	1	0.8%	0	0%	0	0%	1	2.7%	
Leiomyosarcoma	11	9.1%	4	5.3%	1	11.1%	6	16.2%	
Rhabdomyosarcoma	2	1.7%	2	2.7%	0	0%	0	0%	
Angiosarcoma	1	0.8%	1	1.3%	0	0%	0	0%	
Intimal sarcoma	1	0.8%	0	0%	1	11.1%	0	0%	
/Kaposi sarcoma	3	2.5%	2	2.7%	0	0%	1	2.7%	
Lymphangiosarcoma	2	1.7%	2	2.7%	0	0%	0	0%	
PNET	2	1.7%	2	2.7%	0	0%	0	0%	
PNST	1	0.8%	1	1.3%	0	0%	0	0%	
GIST	23	19%	0	0%	0	0%	23	62.2%	
Endometrial sarcoma	3	2.5%	0	0%	0	0%	3	8.1%	
Grade									
Grade 1	17	14%	14	18.7%	3	33.3%	0	0%	0.045[a]
Grade 2	53	43.8%	34	45.3%	3	33.3%	16	43.2%	
Grade 3	45	37.2%	24	32%	2	22.2%	19	51.4%	
Ungraded	6	5%	3	4%	1	11.1%	2	5.4%	
Mitotic rate									
0	1	0.8%	1	1.3%	0	0%	0	0%	0.746[a]
0-9	11	9.1%	6	8%	2	22.2%	3	8.1%	
10-19	9	7.4%	6	8%	0	0%	3	8.1%	
>20	3	2.5%	3	4%	0	0%	0	0%	
Missed	97	80.2%	59	78.7%	7	77.8%	31	83.8%	
Necrosis									
Absent	12	9.9%	8	10.7%	0	0%	4	10.8%	0.819[a]
Present	34	28.1%	22	29.3%	2	22.2%	10	27%	
Missed	75	62%	45	60%	7	77.8%	23	62.2%	
Surgical margin									
Negative	81	66.9%	58	77.3%	3	33.3%	20	54.1%	<0.001[a]
Positive	16	13.2%	11	14.7%	3	33.3%	2	5.4%	
N/A	12	9.9%	3	4%	0	0%	9	24.3%	
Missed	12	9.9%	3	4%	3	33.3%	6	16.2%	
LVI									
Negative	60	49.6%	46	61.3%	3	33.3%	11	29.7%	0.003[a]
Positive	8	6.6%	7	9.3%	0	0%	1	2.7%	
N/A	11	9.1%	6	8%	0	0%	5	13.5%	
Missed	42	34.7%	16	21.3%	6	66.7%	20	54.1%	

Categorical variables were expressed as number (percentage); Continuous variables were expressed as mean ± SD & median (range); a: Chi-square test; b: Kruskal Wallis H test; c: Chi-square test for trend; p-value<0.05 is significant.

Comparison between extremities, retroperitoneal and visceral sarcomas regarding AJCC staging;
Patients who had T2 stage represented 51.2% of all cases: patients who had stage t2 extremities sarcoma were 53.3%, retroperitoneal sarcoma was 44.4%, and visceral was 48.6%, stage N0 was almost of patients represented about 95% of all patients. Patients who had MO stage were 91% and stage 2 was the most common which represent about 49.6%of all patients. Extremities were 52% of them stage 2, retroperitoneal were 55.6%of them and visceral represent 43.2% of them **(Table 3).**

Table (3): Comparison between extremities, retroperitoneal and visceral sarcomas regarding AJCC staging.

AJCC staging	All studied patients (N=121)		Extremities Sarcoma (N=75)		Retroperitoneal Sarcoma (N=9)		Visceral Sarcoma (N=37)		p-value
	No.	%	No.	%	No.	%	No.	%	
T									
T1	18	14.9%	14	18.7%	1	11.1%	3	8.1%	0.052[c]
T2	62	51.2%	40	53.3%	4	44.4%	18	48.6%	
T3	25	20.7%	13	17.3%	3	33.3%	9	24.3%	
T4	16	13.2%	8	10.7%	1	11.1%	7	18.9%	
N									
N0	115	95%	71	94.7%	8	88.9%	36	97.3%	0.609[c]
N1	6	5%	4	5.3%	1	11.1%	1	2.7%	
M									
M0	111	91.7%	73	97.3%	8	88.9%	30	81.1%	0.003[c]
M1	10	8.3%	2	2.7%	1	11.1%	7	18.9%	
AJCC stage group									
Stage I	23	19%	18	24%	1	11.1%	4	10.8%	0.002[c]
Stage II	60	49.6%	39	52%	5	55.6%	16	43.2%	
Stage III	28	23.1%	16	21.3%	2	22.2%	10	27%	
Stage IV	10	8.3%	2	2.7%	1	11.1%	7	18.9%	
Stage IA	4	3.3%	3	4%	0	0%	1	2.7%	0.001[c]
Stage IB	19	15.7%	15	20%	1	11.1%	3	8.1%	
Stage II	60	49.6%	39	52%	5	55.6%	16	43.2%	
Stage IIIA	25	20.7%	16	21.3%	2	22.2%	7	18.9%	
Stage IIIB	3	2.5%	0	0%	0	0%	3	8.1%	
Stage IV	10	8.3%	2	2.7%	1	11.1%	7	18.9%	

Categorical variables were expressed as numbers (percentage); c: Chi-square test for trend; p-value<0.05 is significant.

Comparison between extremities, retroperitoneal and visceral sarcomas regarding treatment;

About 85.1% of all tumor records were able to be resectable, 90.9% of them underwent surgery: 100% of retroperitoneal sarcomas underwent surgery, 96% of extremities underwent surgery and 78.4% of visceral sarcoma underwent surgery. Most of them underwent wide resection about 71.9% of them: extremities sarcoma was 81.3%, retroperitoneal were 100% and visceral were 45.9%, about 77.7% of all patients, records were R0: extremities sarcoma were 85.3% R0, visceral were 70.3% R0 Surgery was done upfront treatment in about 81% of all patient, extremities sarcoma were 85.3%, retroperitoneal were 66.7% and visceral were 70.3%.

Chemotherapy was given to 28.1% of all patient s.:76% of extremities didn't receive chemotherapy, and 70.3% of visceral also didn't receive while 55.6% of retroperitoneal received chemotherapy most of them was given it postoperative 16.5% About 75.9% of all patient records found to have received radiotherapy most common on extremities were 76% of all extremities sarcoma patient. Patients who received radiotherapy as adjuvant radiotherapy represent 48, 8% with a more common dose of 60 Gy in 58.6% (**Table 4).**

Table (4): Comparison between extremities, retroperitoneal and visceral sarcomas regarding treatment.

Treatment	All studied patients (N=121)		Extremities Sarcoma (N=75)		Retroperitoneal Sarcoma (N=9)		Visceral Sarcoma (N=37)		p-value
	No.	%	No.	%	No.	%	No.	%	
Respectability									
Respectable	103	85.1%	70	93.3%	8	88.9%	25	67.6%	0.008[a]
Unrespectable	17	14%	5	6.7%	1	11.1%	11	29.7%	
Borderline resectable	1	0.8%	0	0%	0	0%	1	2.7%	
Surgery									
No	11	9.1%	3	4%	0	0%	8	21.6%	0.006[a]
Yes	110	90.9%	72	96%	9	100%	29	78.4%	
Type of surgery									
No surgery	11	9.1%	3	4%	0	0%	8	21.6%	0.001[a]
Intralesional resection	1	0.8%	0	0%	0	0%	1	2.7%	
Wide resection	87	71.9%	61	81.3%	9	100%	17	45.9%	
Radical resection	22	18.2%	11	14.7%	0	0%	11	29.7%	
Resection									
R0	94	77.7%	64	85.3%	4	44.4%	26	70.3%	<0.001[a]
R1	15	12.4%	8	10.7%	5	55.6%	2	5.4%	
R2	1	0.8%	0	0%	0	0%	1	2.7%	
Not resected	11	9.1%	3	4%	0	0%	8	21.6%	
Surgery timing									
Upfront	98	81%	64	85.3%	6	66.7%	28	75.7%	0.003[a]
Post-chemotherapy	6	5%	4	5.3%	1	11.1%	1	2.7%	
Post-radiotherapy	2	1.7%	2	2.7%	0	0%	0	0%	
Post-chemoradiation	4	3.3%	2	2.7%	2	22.2%	0	0%	
No surgery	11	9.1%	3	4%	0	0%	8	21.6%	
Chemotherapy									
No	87	71.9%	57	76%	4	44.4%	26	70.3%	0.133[a]
Yes	34	28.1%	18	24%	5	55.6%	11	29.7%	
Chemotherapy timing									
No chemotherapy	87	71.9%	57	76%	4	44.4%	26	70.3%	0.029[a]
Pre-operative/RT	7	5.8%	4	5.3%	11	11.1%	2	5.4%	
Post-operative/RT	20	16.5%	11	14.7%	2	22.2%	7	18.9%	
Peri-operative/RT	3	2.5%	1	1.3%	2	22.2%	0	0%	
Chemotherapy alone	1	0.8%	0	0%	0	0%	1	2.7%	
Palliative	3	2.5%	2	2.7%	0	0%	1	2.7%	
Radiotherapy									
No	51	42.1%	18	24%	4	44.4%	29	78.4%	<0.001[a]
Yes	70	57.9%	57	76%	5	55.6%	8	21.6%	
Radiotherapy timing									
No	51	42.1%	18	24%	4	44.4%	29	78.4%	<0.001[a]
Radical	1	0.8%	1	1.3%	0	0%	0	0%	
Preoperative	6	5%	4	5.3%	2	22.2%	0	0%	
Adjuvant	59	48.8%	50	66.7%	2	22.2%	7	18.9%	
Palliative	4	3.3%	2	2.7%	1	11.1%	1	2.7%	
Total RT dose									
30 Gy	8	11.4%	5	8.8%	2	40%	1	12.5%	<0.001[a]
40 Gy	1	1.4%	1	1.8%	0	0%	0	0%	
50 Gy	13	18.6%	6	10.5%	0	0%	7	87.5%	
55 Gy	1	1.4%	0	0%	1	20%	0	0%	
60 Gy	41	58.6%	40	70.2%	1	20%	0	0%	
62 Gy	1	1.4%	1	1.8%	0	0%	0	0%	
66 Gy	5	7.1%	4	7%	1	20%	0	0%	

Categorical variables were expressed as numbers (percentage); a: Chi-square test; p-value<0.05 is significant.

Comparison between extremities, retroperitoneal and visceral sarcomas regarding the outcome of treatment:

The outcome of treatment of all medical records of 109 patients found that local recurrence was found in 26.6% of patients and was more common on retroperitoneal and visceral and mean local recurrence-free survival was 60 months, while the mean of distant Mets-free survival was 84 months and DMFS over 60 months was 84.5% of extremities and 40.8% of visceral, relapse was found in 34 patients. (32.4%) about 17 patients of extremities (23.9%) and 4 retroperitoneal (50%) and 13 visceral (48.1%)

Disease-free survival was 60 months for extremities; DFS was 47 months for retroperitoneal and 46 months for visceral Progression was found in 11 patients about 84.6% of all patients In medical records, mean PFS was 4 months for extremities and 3 months for retroperitoneal sarcoma and was 18 months for visceral sarcoma, we found that events were present in 75 patient (37, 8%) and mean of event-free survival for extremities was 60 months, retroperitoneal event-free survival was 47months and visceral event-free survival was 46 months, mean overall survival was 72 months for extremities and retroperitoneal and overall survival was 18 months for visceral **(Table 5).**

Table (5): Comparison between extremities, retroperitoneal and visceral sarcomas regarding the outcome of treatment.

Outcome of treatment	All studied patients		Extremities Sarcoma		Retroperitoneal Sarcoma		Visceral Sarcoma		p-value
	No.	%	No.	%	No.	%	No.	%	
Local recurrence	(N=109)		(N=72)		(N=8)		(N=29)		
Absent	80	73.4%	57	79.2%	5	62.5%	18	62.1%	0.164[a]
Present	29	26.6%	15	20.8%	3	37.5%	11	37.9%	
Local recurrence Free Survival (LRFS)									
Mean LRFS (months) (95%CI)	60 months (44.83 – 75.16)		60 months (44.75 – 75.24)		NR		60 months (44.83 – 75.16)		0.098[d]
3-years LRFS	75.4%		84.6%		60%		58.7%		
5-years LRFS	47.8%		45.5%		-----		50.3%		
7-years LRFS	12.7%		22.8%		-----		0%		
Distant metastasis	(N=111)		(N=73)		(N=8)		(N=30)		
Absent	87	78.4%	62	84.9%	7	87.5%	18	60%	0.016[a]
Present	24	21.6%	11	15.1%	1	12.5%	12	40%	
Distant metastasis Free Survival (DMFS)									
Mean DMFS (months) (95%CI)	84 months (53.42 – 114.57)		106 months		NR		58 months (41.53 – 174.46)		0.086[d]
3-years DMFS	84.6%		88.4%		87.5%		75.3%		
5-years DMFS	68.9%		84.7%		-----		40.8%		
7-years DMFS	43.4%		58.1%		-----		27.2%		
Relapse	(N=106)		(N=71)		(N=8)		(N=27)		
Absent	72	67.9%	54	76.1%	4	50%	14	51.9%	0.038[a]
Present	34	32.1%	17	23.9%	4	50%	13	48.1%	
Disease Free Survival (DFS)									
Median DFS (months) (95%CI)	60 months (44.42 – 75.58)		60 months (46.64 – 73.35)		47 months (0 – 95.24)		46 months (44.42 – 75.58)		0.029[d]
3-years DFS	73.5%		82.3%		60%		56.5%		
5-years DFS	42.8%		73.8%		-----		41.2%		
7-years DFS	11.4%		22.1%		-----		0%		
Progression	(N=13)		(N=4)		(N=1)		(N=8)		
Absent	2	15.4%	0	0%	0	0%	2	25%	0.478[a]
Present	11	84.6%	4	100%	1	100%	6	75%	
Progression Free Survival (PFS)									
Mean PFS (months) (95%CI)	14 months (0 – 29.89)		4 months (0 – 14.78)		3 months		18 months (8.16 – 27.83)		0.074[d]

Outcome of treatment	All studied patients		Extremities Sarcoma		Retroperitoneal Sarcoma		Visceral Sarcoma		p-value
	No.	%	No.	%	No.	%	No.	%	
1-year PFS	61.5%		50%		0%		75%		
2-years PFS	26.4%		0%		0%		45%		
3-years PFS	26.4%		0%		0%		45%		
Events	(N=119)		(N=75)		(N=9)		(N=35)		
Absent	74	62.2%	54	72%	4	44.4%	16	45.7%	0.016[a]
Present	45	37.8%	21	28%	5	55.6%	19	54.3%	
Event-free Survival (EFS)									
Mean EFS (months) (95%CI)	60 months (48.66 – 71.33)		60 months (46.59 – 73.40)		47 months (9.37 – 84.62)		46 months (25.14 – 66.85)		0.013[d]
3-years EFS	68%		77.2%		53.3%		53.8%		
5-years EFS	36.8%		41.5%		-----		30.7%		
7-years EFS	9.8%		20.7%		-----		0%		
Mortality	(N=121)		(N=75)		(N=9)		(N=37)		
Alive	88	72.7%	58	77.3%	3	33.3%	27	73%	0.020[a]
Died	33	27.3%	17	22.7%	6	66.7%	10	27%	
Overall Survival (OS)									
Mean OS (months) (95%CI)	72 months		72 months		18 months (12.15 – 23.84)		NR		0.005[d]
3-years OS	76.1%		79.7%		44.4%		77.3%		
5-years OS	58.5%		67.4%		-----		56.7%		
7-years OS	46.5%		46.2%		-----		56.7%		

Categorical variables were expressed as numbers (percentage); Continuous variables were expressed as median (95%CI); 95%CI: 95%Confidence Interval; NR: not reached yet; a: Chi-square test; d: Log-rank test; p-value<0.05 is significant.

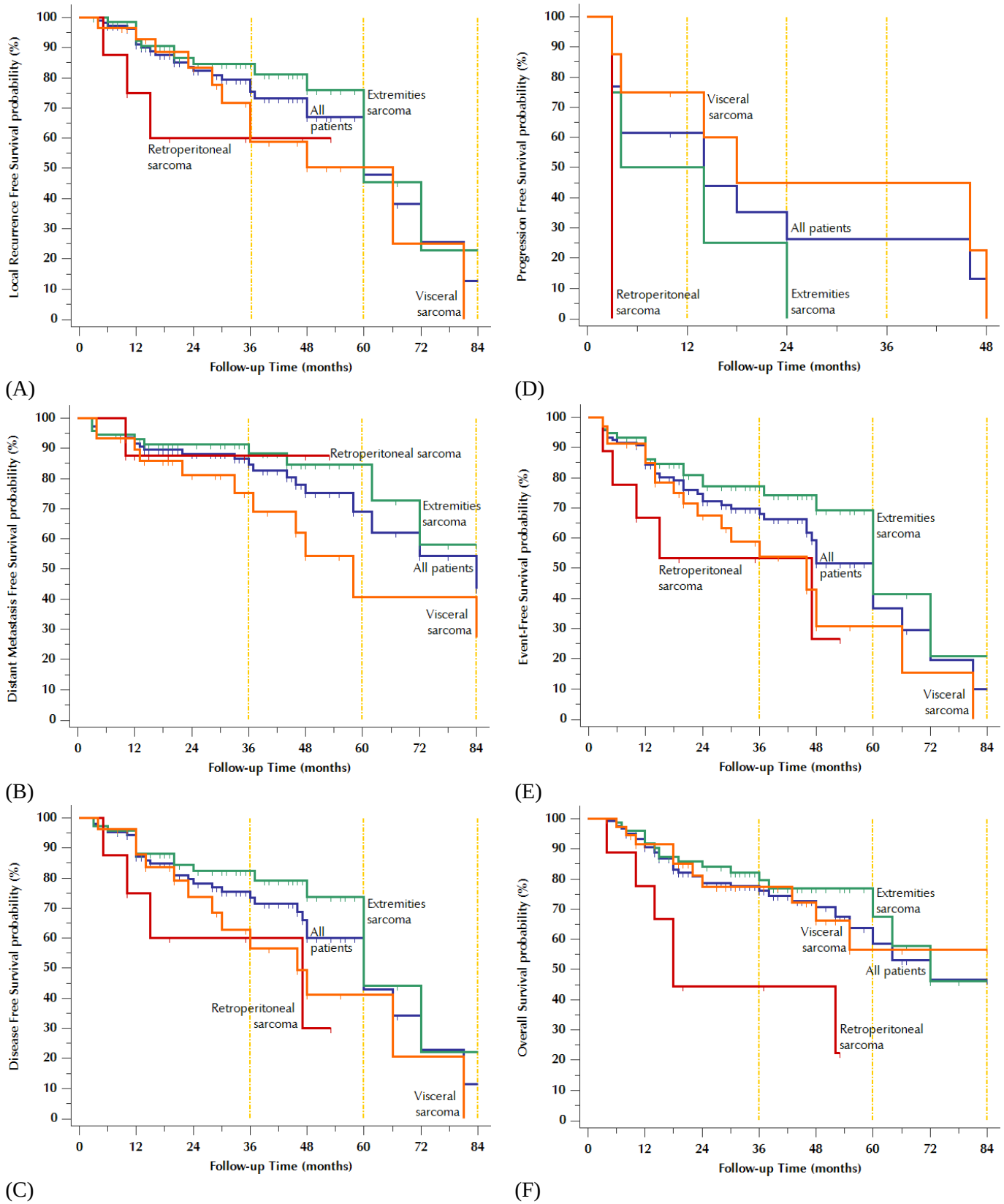

Figure (1): Kaplan Meier plot stratified by type of sarcoma: (A) Local Recurrence Free Survival (LRFS); (B) Distant Metastasis Free Survival (DMFS); (C) Disease Free Survival (DFS); (D) Progression Free Survival (PFS); (E) Event-Free Survival; (F) Overall Survival (OS).

DISCUSSION

Including 109 patients, this is a study with epidemiological and clinical aspects of STS in Egypt with a comparison between extremities, visceral and retroperitoneal sarcomas, with data from 2 Egyptian oncological departments and covering a long time frame (12 years).

The Egyptian STS patient's epidemiological profile matched those of other foreign cohorts, it was discovered. **Saltus *et al.*** [12] as the median age was above 50 years old and more common in the lower extremities but in our study female patients were more than male patients. In a 2015 study of soft tissue sarcomas in France **Honoré *et al.*** [13] reported that 40% of cases were truncal (17% thoracic, 9% retroperitoneal, 8% pelvic, and 6% abdominal), whereas 60% of cases were peripheral (49% on a limb and 11% head and neck) which looks like our study as extremities' sarcoma were 62% and visceral plus retroperitoneal were 38%, we found that most common histological type was 19%, liposarcoma were 13%, fibro sarcoma were 11%, GIST was 19% and leiomyosarcoma was 9% unlikely the current study, liposarcoma was the most common STS in Japan accounting for 32.5% of cases. However, the order of frequency of the various liposarcoma subtypes was different (myxoid/round cell, followed by dedifferentiated, then well-differentiated subtype in the Japanese study versus well-differentiated, followed by myxoid/round cell, followed by well-differentiated subtype in the current study).

The second in order in Japan was undifferentiated pleomorphic sarcoma (19.5%), followed by leiomyosarcoma (6.5%), myxofibrosarcoma (5.9%), synovial sarcoma (5.8%). In our study, about seventy-five patients (62%) were retroperitoneal sarcoma, nine patients (7.2%), and visceral sarcoma thirty-seven patients (30.6%). There was a slight overall female predominance they were (52.9%): extremities sarcomas (53.3%) of them, retroperitoneal were (66.7%) of theme and visceral had male predominance (51.4%), the total median age was 52 years old by 47 years old median ages for extremities and 60 years old for retroperitoneal and 57 years old for visceral sarcomas Adult were more common to be affected by (73.6%) from the total number of all: extremities sarcoma were (78.7%), retroperitoneal sarcoma was (55.6) and visceral sarcoma was (67.6).

The most comma clinical presentation for all types was painless soft tissue swelling (92%) but in visceral sarcomas most common was abdominal mass (81.1%) rhabdomyosarcoma was second in frequency (17%) but only accounted for 2.5% of STSs in Japan, and Ewing sarcoma/PNET was even less common (1.9%) [14], staging and grading of tumor have an important impact on prognosis, suggested a staging method based on these criteria and evaluated it against the AJCC staging system[15], in our study most common was T2 and stage II in extremities', visceral and retroperitoneal, Grade 2 was most common among all types which were 45.3% in extremities, 43.2% in visceral and 33.3% in retroperitoneal, necrosis was present in 28% of all records mostly among extremities sarcoma was 29.3%, among all records surgical margin was negative in 66.9%: extremities sarcoma were 77%, retroperitoneal sarcoma were 33.3% and visceral sarcoma was 54.8%. Combining radiotherapy and surgery can improve local control rates while requiring less invasive procedures[16].

In our study Surgery was done upfront treatment in about 81%, 85.3% of extremities', 66.7% of retroperitoneal, and 70.3% of visceral, and about 75.9% of all patient records were found to have received radiotherapy most commonly on extremities 76% patient, who received it was as adjuvant radiotherapy 48.8% more in extremities 66.7% with a more common dose of 60 Gy in 58.6% as 60 Gy was the stander of care in several studies [15-17]. The grade, margins of excision, and usage of radiation all influence local recurrence. According to this French Sarcoma Group study, late relapses may occur, especially in retroperitoneal or very big STS, even though most events will occur during the first five years after diagnosis[18].

In our study relapse occurred in 50% of retroperitoneal patients. While, in 23% of extremities' sarcoma, according to earlier data, the five-year overall survival (OS) rate of retroperitoneal sarcoma was 60%[19]. In our study mean overall survivals were 72 months for extremities and retroperitoneal and 18 months for visceral, disease-free survival was 60 months for extremities, 47 months for retroperitoneal, and 46 months for visceral.

CONCLUSION

Overall survival (OS) is better in extremities than retroperitoneal sarcoma, local recurrence-free survival (LRFS) was better in extremities and visceral sarcoma, disease-free survival (DFS) was better in extremities than retroperitoneal which was better than visceral sarcoma and progression-free survival (PFS) was better in extremities than visceral sarcoma.

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