

Local recurrence of soft tissue sarcoma revisited: Is there a role for “selective” radiation?

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BACKGROUND

- Soft tissue sarcomas (STS) are uncommon tumors of mesenchymal origin, most commonly affecting the extremities.
- In recent decades multimodal treatments for STS have become standard, with combination surgery and external radiation treatment used together to improve local control and patient survival.
- Certain prognostic factors, such as positive surgical margins, are associated with an increased risk of local recurrence.
- Perioperative radiation is generally utilized when a high-grade soft tissue sarcoma is removed with close or positive margins.
- However, there are occasional clinical situations, such as delayed wound healing, the perception of adequate margins, or patient preferences, where treatment is with surgical excision alone.

PURPOSE

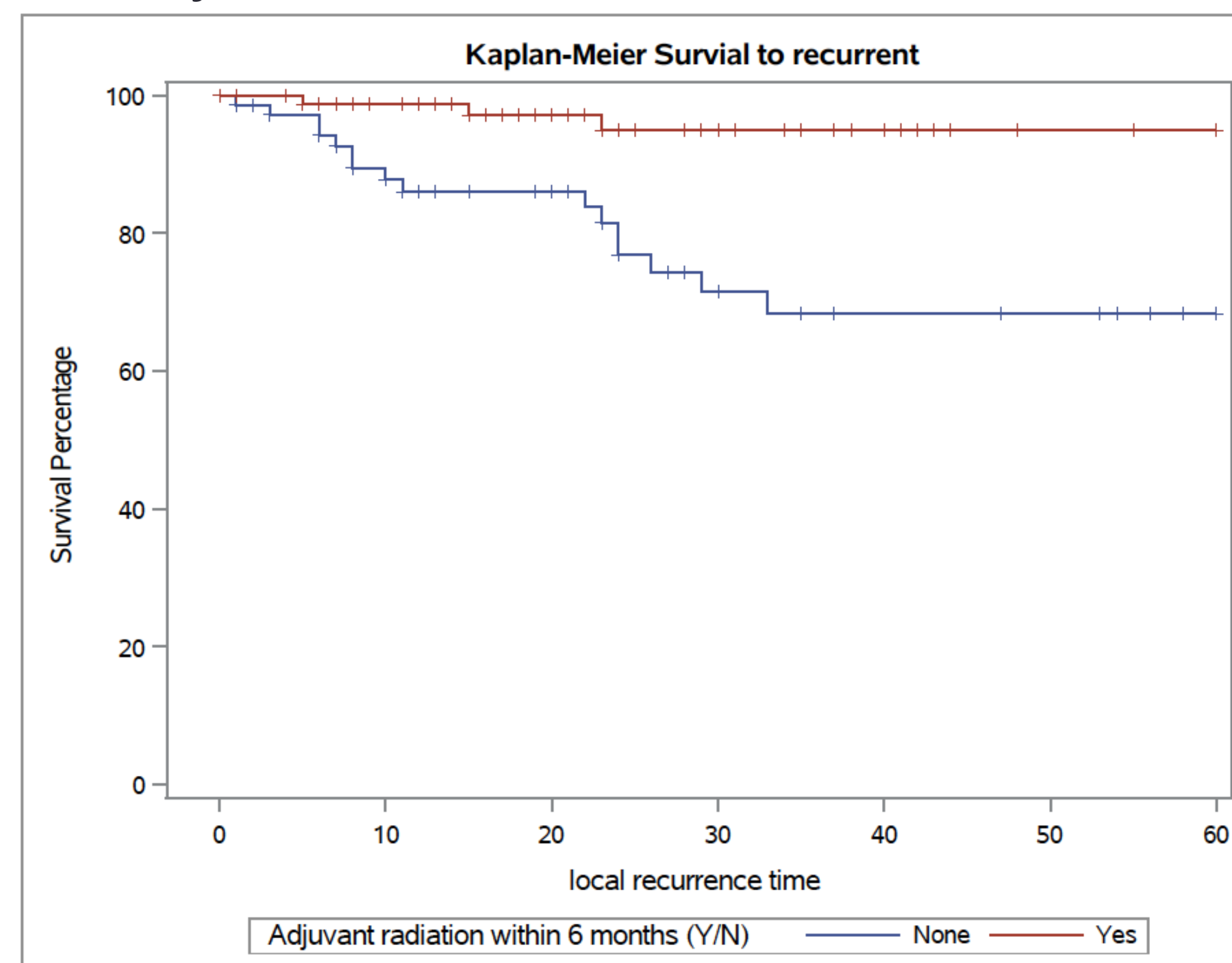
- Primary Aim:** determine the local recurrence rate of soft tissue sarcoma which would have met criteria to receive perioperative radiation, but were not treated with radiation.
- Secondary Aim:** further elucidate any associations between local recurrence and patient, tumor, and treatment factors in the group of patients who did not receive radiation.

METHODS

- Through a retrospective review of consecutive soft tissue sarcoma patients in the electronic medical record, recorded patient demographics, tumor characteristics, treatment, recurrence, and survival.
- Included patients 18 years or older with diagnosis of a primary (nonrecurrent) grade 2/3 or 3/3 STS who presented for initial resection or tumor bed re-excision between September 1, 2010 and May 8, 2019.
- Used simple bivariate statistical methods (chi squared and Fisher’s exact testing) and time-based survival measurements to investigate variables associated with the primary endpoint of local recurrence.
- Multivariate Cox proportional hazards model was calculated using death as a competing risk for local recurrence.

RESULTS

Comparison of local recurrence rates in the entire cohort



Univariate associations of local recurrences in all 166 patients

	Recurrence	No recurrence	p value
Age			
<65	6	75	0.111
≥65	13	72	
Sex			
Female	9	65	0.795
Male	10	82	
Histology			
Leiomyosarcoma	0	21	<0.001
Myxofibrosarcoma	12	21	
UPS	4	53	
Other	3	52	
Grade			
High (3/3)	14	93	0.372
Int (2/3)	5	54	
Metastasis at diagnosis			
Yes	3	34	0.571
No	16	113	
Size			
<5 cm	9	38	0.145
≥5 cm	10	109	
Depth			
Superficial	9	35	0.029
Deep	10	112	
Prior surgery			
Yes	9	23	0.003
No	10	124	
Radiation			
Preoperative	0	58	0.002
Postoperative	3	24	
None	16	65	
Margins			
Wide	7	67	0.036
Marginal	5	59	
Intralesional	7	20	

Univariate associations of local recurrences in 81 patients treated without radiation

	Recurrence	No recurrence	p value
Age			
<65	5	39	0.039
≥65	11	26	
Sex			
Female	8	27	0.540
Male	8	38	
Histology			
Leiomyosarcoma	0	14	<0.001
Myxofibrosarcoma	12	13	
UPS	2	13	
Other	2	25	
Grade			
High (3/3)	11	42	0.755
Int (2/3)	5	23	
Metastasis at diagnosis			
Yes	3	14	1.000
No	13	51	
Size			
<5 cm	9	29	0.769
≥5 cm	7	36	
Depth			
Superficial	9	30	0.469
Deep	7	35	
Prior surgery			
Yes	9	21	0.076
No	7	44	
Margins			
Wide	6	48	0.012
Marginal	5	11	
Intralesional	5	6	

Multivariate cox proportional hazards model for local recurrence at 5 years, with competing risk of death, for the full cohort and patients without radiation treatment.

	Full cohort			No radiation		
	HR	95% CI	p value	HR	95% CI	p value
Age						
<65	ref		0.372	ref		0.409
≥65	1.765	0.507-6.149		1.794	0.449-7.172	
Sex						
Female	1.338	0.482-3.715	0.576	1.671	0.534-5.229	0.378
Male	ref			ref		
Histology						
Myxofibrosarcoma	4.489	1.841-12.776	0.001	6.424	1.796-22.978	0.004
Other	ref			ref		
Grade						
High (3/3)	1.327	0.450-3.918	0.608	1.133	0.305-4.208	0.852
Int (2/3)	ref			ref		
Size						
<5 cm	ref		0.1552	ref		0.537
≥5 cm	2.590	0.697-9.621		2.308	0.479-11.117	0.297
Depth						
Superficial	1.165	0.297-4.575	0.827	ref		
Deep	ref			1.043	0.194-5.619	0.961
Prior surgery						
Yes	2.567	0.823-8.004	0.1041	2.836	0.844-9.533	0.092
No	ref			ref		
Radiation						
Yes	ref		0.024			
No	5.446	1.254-23.654				
Margins						
Wide	ref		0.145	ref		0.063
Not wide	2.484	0.730-8.453		3.426	0.937-12.527	

CONCLUSIONS

- The overall local control rate in high-grade STS without use of adjuvant XRT in this cohort was 80.2% (16/81 cases).
- This was disproportionately due to myxofibrosarcoma (12/25 cases, 48.0%) and lower rates of recurrence were seen in other subtypes (4/56 cases, 7.1%).
- In certain circumstances, treatment with a negative margin surgical resection followed by close observation is justifiable.
- However, durable local control may be more difficult in myxofibrosarcoma and resections with close or positive margins.
- In these circumstances, the addition of radiation or a wider excision is recommended to minimize the likelihood of local recurrence.

IMPACT

- The associations found in STS patients who have not received radiation therapy and experienced local recurrence will help to guide conservative management strategies
- This research further supports recommendations for aggressive treatment of myxofibrosarcoma.

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