Clinical Outcomes after Definitive Treatment of Soft Tissue Sarcoma of the Hand

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INTRODUCTION:

Soft tissue sarcoma (STS) of the hand is rare and definitive treatment is wide surgical excision sometimes necessitating ray or partial hand amputation. Postoperative survival rates and functional outcomes must be better defined in this cohort. We hypothesize that histologic type and positive surgical margins are risk factors for recurrent disease. Additionally, tumor size, grade, and age may be risk factors for worse functional outcome in this population.

METHODS:

109 consecutive patients undergoing definitive surgical treatment for STS of the hand from 1995-2019 by a single surgeon at a sarcoma center were evaluated. Patient demographic and surgical data were reviewed. Primary outcomes included disease free survival (DFS), overall survival (OS), and functional outcome, as assessed by the Musculoskeletal Tumor Society (MSTS) system. Patients who underwent hand amputation were excluded from the MSTS analysis (n = 2). OS was calculated from the date of definitive surgery until death. DFS was calculated from the date of no evidence of disease to the date of recurrence or death. Patients were censored at their last known alive date. Kaplan-Meier methods were used to estimate 5 and 10-year survival. Low event rates precluded statistical evaluation of risk factors for survival. For functional outcomes, univariable associations between patient and clinical characteristics were assessed; features statistically significant at a p-value threshold of 0.2 were included in a multivariable linear model.

RESULTS:

Patient and tumor characteristics are summarized in Table 1. Patients without an event had a median follow up of 6 years (IQR 3, 10). Among 107 patients eligible for DFS there were 10 events: 4 local recurrences, 5 distant recurrences and 1 death without recurrence. The 4 local recurrences were all deep tumors; two were myxofibrosarcoma and two were myxoinflammatory fibrosarcoma. 5- and 10-year DFS was 91% (95% CI: 85%-97%) and 89% (95% CI: 82%-96%). There were 7 deaths; 5 and 10-year overall survival was 95% (95% CI: 90%-100%), and 92% (95% CI: 84%-100%). There was no disease recurrence seen after six years. Median MSTS score was 28 (IQR: 27, 30). Multivariable linear regression identified older age and higher grade as risk factors for worse functional outcome.

DISCUSSION AND CONCLUSION:

The 5- and 10-year disease free survival of patients undergoing definitive treatment of primary soft tissue sarcoma of the hand were 91% and 89%. All local recurrences were deep tumors and either myxofibrosarcoma or myxoinflammatory fibrosarcoma. There were no local or distant recurrences were seen after 6 years. The median MSTS score was 28. Independent risk factors for worse functional outcome included older age and high-grade tumors. These data may inform future surveillance strategies and help counsel our patients in terms of expected survival as extrapolation from the lower extremity soft tissue sarcoma data may not be comparable.

Characteristic	N = 109; Median (IQR); n (%)
Age at presentation	36 (26, 49)
Sex (Male)	55 (50%)
High Grade	70 (64%)
Size	2.10 (1.30, 4.00)
Depth: Deep (to fascia)	96 (88%)
Stage I	39 (36%)
Stage II	59 (54%)
Stage III	7 (6.4%)
Stage IV	4 (3.7%)
Wide Excision	59 (54%)
Partial Amputation	4 (3.7%)
Single Ray Amputation	32 (29%)
Double Ray Amputation	6 (5.5%)
Triple Ray Amputation	1 (0.9%)
Thumb Amputation	5 (4.6%)
Below Elbow Amputation	1 (0.9%)
Above Elbow Amputation	1 (0.9%)
Negative Margins	103 (94%)
MSTS Score	28 (27, 30)
Chemotherapy	13 (12%)
Radiation Therapy	36 (33%)