

Oncologic Implications in Early vs. Late Tumor Bed Excision After Unplanned Sarcoma Resection: A Retrospective Analysis

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INTRODUCTION: Unplanned excisions (UE) were defined as the surgical removal of sarcoma without preoperative measures, including biopsy and imaging, whereas planned excision (PE) included such measures. As preoperative planning can influence surgical outcomes and patient quality of life, this investigation aimed to evaluate differences between patients undergoing UE vs. PE, in terms of oncological outcomes related to the timing of the TBE.

METHODS:

Retrospective data collection was performed using electronic health records of 397 patients who were treated for soft tissue sarcomas from 2012 to 2020. The time (months) from UE to the first visit at the sarcoma center was used to discriminate between early and late TBE, with two months as the cutoff point. JMP Pro 18 was used to compare metastatic rate, treatment modalities, and mortality between PE and TBE post-UE groups using chi-square tests, with subgroup analysis by timing and metastatic burden.

RESULTS:

Among 117 patients who underwent tumor bed excision (TBE) following unplanned excision (UE), 26 (22.2%) were treated with early TBE (defined as ≤ 2 months from initial UE), while 91 (77.8%) underwent delayed TBE (> 2 months). Patients in the late TBE group demonstrated significantly worse oncologic outcomes. Metastatic disease occurred in 48.4% of late TBE patients, compared to only 11.5% of those in the early TBE group ($p = 0.0016$). Mortality was also notably higher in the late TBE group (30.8% vs. 3.8%, $p = 0.0109$). Although not statistically significant, there was a trend toward higher residual tumor burden in late TBE patients (73.6%) compared to early TBE (57.7%, $p = 0.1861$), as well as a higher incidence of positive resection margins (29.7% vs. 11.5%, $p = 0.1068$). Rates of re-resection followed a similar pattern (29.7% vs. 11.5%, $p = 0.1068$). Additionally, in the broader cohort, bone metastases were significantly more frequent in UE patients compared to those treated with planned excision (25.5% vs. 8.2%, $p = 0.0142$).

DISCUSSION AND CONCLUSION:

This study demonstrates that delayed tumor bed excision following unplanned sarcoma resection is associated with significantly worse oncologic outcomes, including markedly higher rates of metastasis and mortality. The striking difference in metastatic burden between early and late TBE groups highlights the importance of timely referral to a sarcoma center. Although residual tumor and margin positivity did not reach statistical significance, the numerical trends suggest that tumor progression and incomplete excision may contribute to the observed disparities in survival.

These findings reinforce that the window between initial UE and definitive re-excision is a critical period in determining long-term patient outcomes. Prolonged delays likely permit microscopic disease progression, increasing the risk of systemic dissemination. As such, early TBE, ideally within 2 months of the initial unplanned procedure, should be prioritized in all eligible patients. The data also supports the incorporation of individualized metastatic evaluation and surveillance protocols for patients undergoing delayed TBE, given their heightened risk profile.

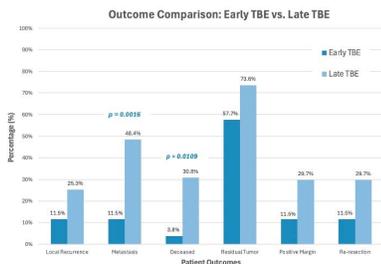


Figure 1. Outcomes Based on Early vs. Late TBE

Table 1. Outcomes Based on Early vs. Late TBE

Outcome	Early TBE	Late TBE	p-value
Local Recurrence	11.5% (3)	25.3% (23)	0.2231
Metastasis	11.5% (3)	48.4% (44)	0.0016
Deceased	3.8% (1)	30.8% (28)	0.0109
Residual Tumor	57.7% (15)	73.6% (67)	0.1861
Positive Margin	11.5% (3)	29.7% (27)	0.1068
Re-resection	11.5% (3)	29.7% (27)	0.1068