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Total Volume of Post-Operative Seroma Correlates with Wound Complications Following Soft-Tissue Sarcoma Resection

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Introduction: Soft-tissue sarcomas (STS) are a heterogeneous group of malignancies of mesenchymal origin. The mainstay of treatment for non-metastatic STS involves neoadjuvant radiation and surgical excision with wide margins. Therapeutic management of STS is known to carry a high rate of wound complications following resection, especially when performed in conjunction with radiation therapy. Less is known regarding the influence of tumor size and post-operative seroma size on wound complications.

Methodology: Patients who underwent surgical management for STS at our institution between the years 2010 and 2020 were identified. Patients were excluded if they did not have sufficient post-operative imaging or if they underwent amputation. Clinical and demographic variables were documented for each patient. Detailed 2-dimensional and 3-dimensional measures of the tumors and post-operative seromas were evaluated with OsiriX MD imaging software. Occurrences of short and long-term wound complications were documented for each patient, in association with demographic, diagnostic, tumor size variables, and seroma size variables.

Results: There were 512 STS patients treated during the inclusion period. 344 patients met criteria for final analysis, with 187 males (54.4%) and 157 females (45.6%), and the median age was 57.0. Undifferentiated pleomorphic sarcoma was the most common histologic subtype (22.7%), and the thigh was the most common primary location (34.3%). There were 79 patients (23.0%) with documented wound complications. Dehiscence was significantly more common with neoadjuvant radiation, older age, high histologic grade, diabetic status, larger seroma length and volume, and lower extremity location. Two-dimensional tumor size did not have a significant association with wound complications, but tumor volume was significantly associated with formation of post-operative seromas and post operative wound complications.

Conclusion: STS remains a challenging diagnosis for patients and their surgeons, both in terms of long-term oncologic management and short-term surgical outcomes. Increased volume of the tumor correlated with post-operative seroma volume, and post-operative seroma volume directly correlated with wound complications in this cohort. This study prompts further exploration of the volumetric influence of tumor size and seroma size on surgical site complications, and management of dead space following STS resection may represent a target for surgical optimization.