

The Effect of Time Interval between Radiation and Soft Tissue Sarcoma Flap Reconstruction

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BACKGROUND

Soft tissue sarcomas (STS) are treated with wide local excision, and large defects often must be reconstructed with locoregional or free flaps for adequate coverage. A subset of patients will receive adjuvant radiation therapy (XRT), which has been shown to decrease local recurrences. However, the timing of adjuvant XRT with respect to reconstructive outcomes has not yet been studied. Here we present our experience with STS flap reconstruction in patients who receive early versus late radiation therapy.

METHODS

We performed a retrospective chart review of patients with extremity soft tissue sarcomas requiring immediate flap reconstruction between January 2012 and May 2019. All patients received adjuvant XRT. Surgeries were performed by a single extirpative and a single reconstructive surgeon. Patients were broken up into early radiation (<2 months) and a late radiation (>2 months) groups. Outcomes included patient demographics, radiation details and complication rates. Musculoskeletal Tumor Society (MSTS) scores were used to calculate patient long-term functional outcomes.

RESULTS

Nineteen patients with 21 flaps were identified. Nine patients reconstructed with 10 flaps received early radiation. Ten patients reconstructed with 10 flaps received late radiation. Sixteen patients were reconstructed with locoregional advancement/rotation flaps, 3 patients with pedicled flaps, and 1 patient with a free flap. The average time to early radiation was 47 days (range 39-54). The average time to late radiation was 101 days (range 67-266). Average time to follow up was 23 months. There was no significant difference in patient characteristics including age, BMI, smoking status, or comorbidities. Radiation doses were comparable at an average of 57Gy in early versus 53Gy in late radiation therapy. Complication rates were similar between the two groups. There was no significant difference in wound breakdown between early (1 patient) versus late (0 patients) radiation groups. ($p>0.99$). The only patient with breakdown was treated

with local wound care. There was no significant difference in wound infection rates between early (1 patient) versus late (2 patients) radiation groups. ($p>0.99$). No patients had partial or complete flap loss. MSTS scores were comparable between the early (93%) versus late (83%) groups ($p=0.09$).

CONCLUSION

We found no significant difference in complication rates or long-term outcomes between early versus late XRT in patients undergoing STS flap reconstruction. We conclude that there are no contraindications to XRT prior to 2 months after flap reconstruction, and early XRT in these patients is safe.