

Preoperative radiation therapy and its effects on outcomes in microsurgical head and neck reconstruction

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OBJECTIVE: Preoperative radiation therapy is considered a significant factor in head and neck reconstruction.

STUDY AND DESIGN AND SETTING: In our consecutive series of 114 patients, 44 patients had prior head and neck irradiation. The 2 groups were compared on the basis of age, ischemic time, and flap size and were found not to be statistically different. The average ischemic time for the irradiated group was 94.1 minutes, and the average was 102.8 minutes for the nonirradiated group. The average flap size for the irradiated group was 69.5 cm² and was 72.0 cm² for the nonirradiated group.

RESULTS: Using a single-factor analysis of variance, the 2 groups did not differ statistically. The overall major flap complication rate for both irradiated and nonirradiated groups was approximately 10%.

CONCLUSION: Microvascular reconstruction was accomplished in both irradiated and nonirradiated head and neck patients, with a 99% total flap survival rate and a 10% major flap complication rate. (Otolaryngol Head Neck Surg 2005;132:845-8.)

Free-tissue transfer has become a frequently used method of reconstruction for significant defects after tumor ablation, tissue resection, and trauma. Since the introduction of the jejunal free flap by Seidenberg,¹ numerous donor sites have been identified and used. Successful microvascular anastomosis depends on comorbidities, including age, arteriosclerosis, smoking, diabetes, and prior irradiation. It has been noted that age alone is not associated with a higher risk for developing complications.^{2,3} Prior irradiation is considered a significant factor in flap failure. Singh et al² stated that patients with prior irradiation had a signifi-

cantly higher likelihood of developing complications at the recipient site. Studies also have focused upon the histological findings of irradiated tissue. In the laboratory, supplemental basic fibroblast growth factor (bFGF) has been shown to demonstrate increased epidermal regeneration.⁴

We sought to study the effects of prior irradiation in patients undergoing free tissue transfer after tumor resection and following treatment for other head and neck pathology. Specifically, we studied flap survival rates, major and minor complications, flap revision rates, and ischemic times for our consecutive series of 114 patients who had undergone free tissue transfer in the head and neck.

MATERIAL AND METHODS

We reviewed all consecutive patient charts from a single institution in the last 8 years. Approval from the Institutional Review Board of the Feinberg School of Medicine at Northwestern University was secured. Inclusion criteria consisted of consecutive head and neck patients who had undergone free tissue transfer after tumor resection or treatment for other pathology over a specified time. Tumor resection was accomplished by the Otolaryngology Service by 1 surgeon, and reconstruction was performed by 2 surgeons from the Division of Plastic and Reconstructive Surgery. Each patient's perioperative course was reviewed and was noted for name, gender, age, donor site and flap, oncologic procedure, lesion histology, days spent in the intensive care unit postoperatively, anastomotic vessels, tumor stage, ischemic time, flap size, American Society of Anesthetists (ASA) class, tobacco usage, alcohol usage, prior irradiation, and transfusions given.

In the last 8 years, we reviewed 114 consecutive patients who underwent free tissue transfer after head and neck tumor ablation. Surgical outcome was defined by flap survival, need for revision surgery, donor site morbidity, and flap ischemia or loss. Major complications were defined as total flap loss or revision surgery. Minor complications included limited flap necrosis, infection, and prolonged local wound care.

Patients who had prior head and neck irradiation before tumor resection and free flap reconstruction were separated from the patients who had not received any prior irradiation. A single factor of analysis (ANOVA) was used to compare the nonirradiated

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