Mapping Morbidity: Comparative Meta-Analyses of Donor-Site Complications in Free-Flap Reconstruction for Head & Neck Cancer

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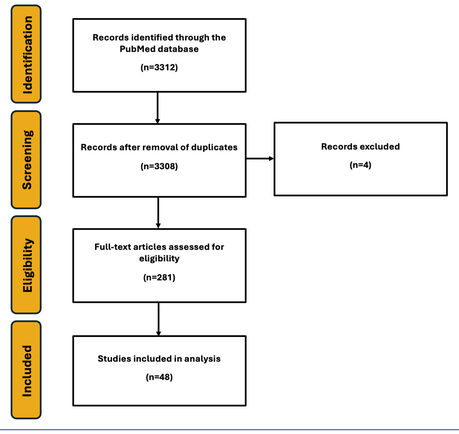
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Introduction

Microvascular free-tissue transfer is a cornerstone of head and neck reconstruction, enabling restoration of complex soft-tissue and osseous defects following oncologic resection.[1,2] Among the most common donor sites for free-flap harvest are the radial forearm, the anterolateral thigh, fibula, scapula, latissimus dorsi, and lateral arm. While flap selection is largely guided by recipient-site requirements and reconstructive goals, donor-site morbidity is an important consideration that may affect postoperative recovery, function, and patient quality of life.[3–6] Common donor-site morbidities include wound complications, such as infection, hematoma, seroma, dehiscence, and the need for additional operative intervention.[3-9] These complications may also influence patient satisfaction and long-term functional outcomes.

Existing studies frequently evaluate donor-site morbidities at individual flap sites, but provide limited comparisons, making direct assessment of morbidity across the most commonly utilized donor sites difficult.[5,7,10–12] In this systematic review and series of meta-analyses, we aim to establish pooled estimates of donor-site morbidity across six commonly utilized free-flap donor sites in head and neck reconstruction, providing comparative benchmarks to inform surgical planning and patient counseling.

Methods



Results

Across 48 studies that included 4230 total patients, 6 meta-analyses were conducted. Donor-site complications included seroma, hematoma, return to OR, dehiscence, and infection. Pooled incidence estimates for overall morbidity at each donor-site were conducted under a random effects model and were found to be 14% at the radial forearm donor site, 16% at the anterolateral thigh donor site, 26% at the fibular donor site, 9% at the scapular donor site, 25% at the latissimus dorsi donor site, and 5% at the lateral arm donor site.

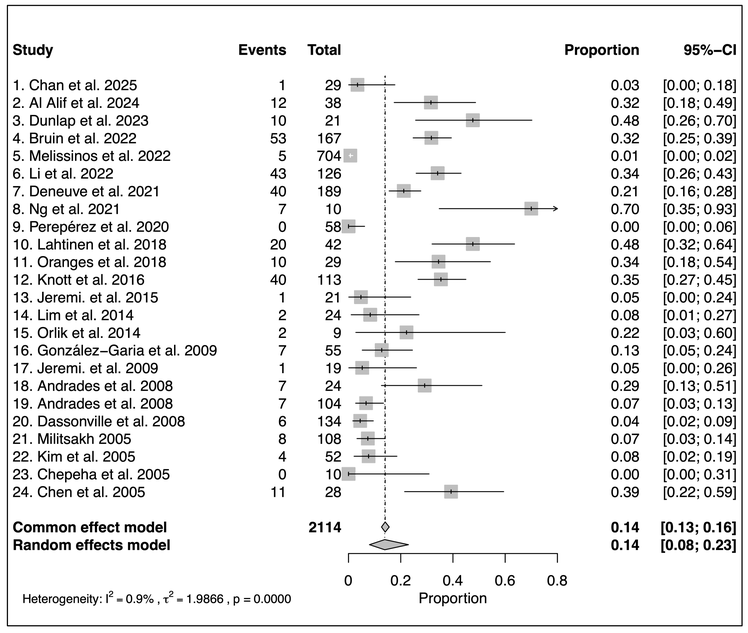


Table 1: Forest plot for radial forearm donor-site complication rate

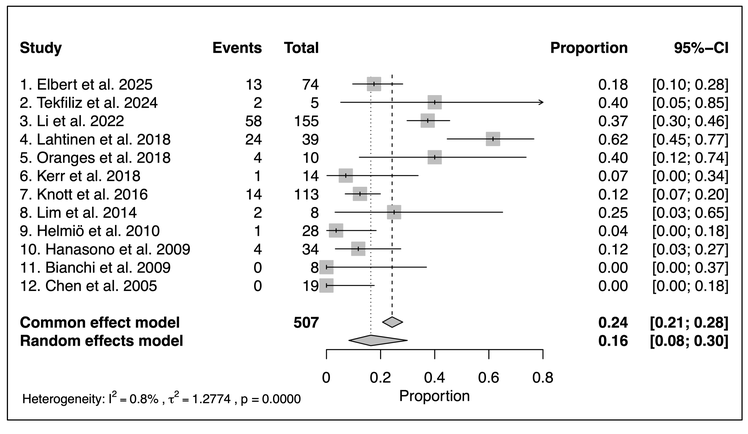


Table 2: Forest plot for anterolateral thigh donor-site complication rate

Discussion and Conclusion

Donor-site morbidity varied substantially between our included free-flap donor sites, with pooled complication rates ranging from 5% at the lateral arm to 26% at the fibula. The fibula and latissimus dorsi demonstrated the highest pooled morbidity, while the lateral arm and scapular donor sites demonstrated the lowest. These findings allow for more specific comparison between donor sites during the pre-operative selection process, particularly when multiple reconstructive options are technically appropriate. The pooled estimates generated in this study may provide useful benchmarks for preoperative counseling and shared decision-making.

Interpretation should remain cautious, as these estimates were derived from separate single-proportion meta-analyses rather than direct head-to-head comparisons. Differences in study populations, complication definitions, follow-up duration, operative technique, and reporting practices may contribute to variation between donor sites.

Donor-site morbidity differs significantly across free-flap harvest sites utilized in head and neck reconstruction. Defining these complications across donor sites provide comparative benchmarks that may help surgeons balance reconstructive requirements with donor-site risk and to counsel patients regarding expected postoperative morbidity.

References/Contact Info