Unintended Consequences: Meta-analyses of Donor-limb Sensory and Motor Dysfunction Following Head & Neck Free-flap Reconstruction

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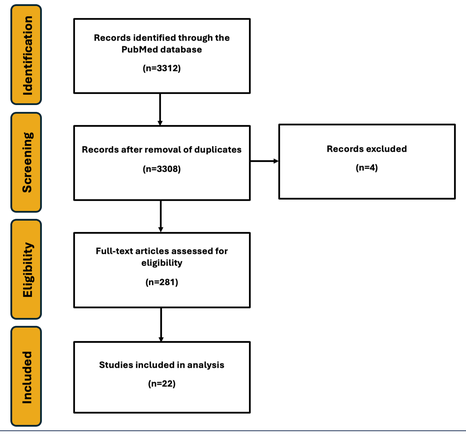
Introduction

Microvascular free-tissue transfer is widely utilized for reconstruction of complex head and neck defects following oncologic resection. Among the most commonly harvested donor sites are the radial forearm and anterolateral thigh.[1-3] Although attention is often focused on outcomes at the reconstructed site, harvesting tissue from an otherwise healthy extremity may result in persistent donor-limb morbidity that can affect postoperative function and quality of life.[4-6]

Neurologic dysfunction following flap harvest may manifest as sensory deficits, including numbness, paresthesia, or altered sensation, as well as motor deficits affecting strength, mobility, and extremity function.[4-8] These complications may persist beyond the immediate postoperative period and contribute to long-term functional impairment.[6-9]

Despite the clinical importance of preserving donor-limb function, reported rates of neurologic morbidity vary considerably across the literature, and studies frequently evaluate individual donor sites or outcomes in isolation.[5,7,10-12] This systematic review and series of meta-analyses aims to establish pooled estimates of motor and sensory dysfunction following radial forearm and anterolateral thigh free-flap harvest to provide benchmarks for donor-site selection and preoperative patient counseling.

Methods



Results

Across 22 studies that included 1759 total patients, 4 meta-analyses were conducted. Pooled incidence estimates obtained for donor-limb motor and sensory dysfunction were conducted under a random effects model and were found to be 17% and 30%, respectively, in the upper extremity following radial forearm donor-flap harvest, and 11% and 19%, respectively, in the lower extremity following anterolateral thigh donor-flap harvest.

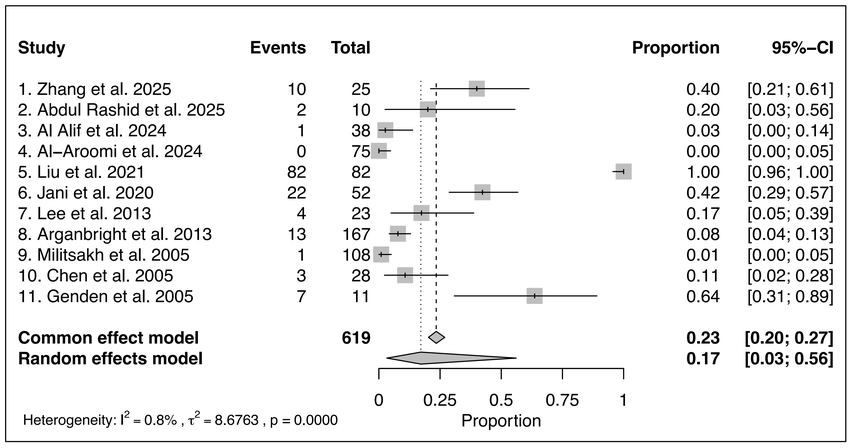


Table 1: Forest plot of radial forearm motor dysfunction

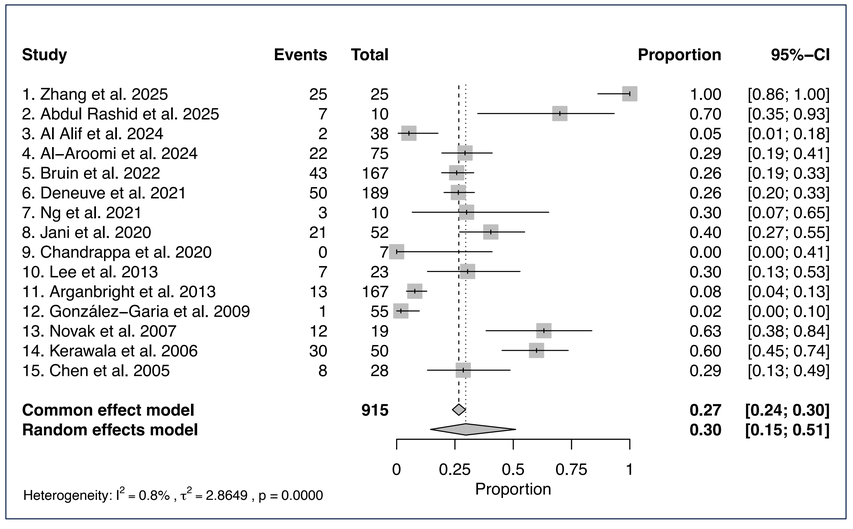


Table 2: Forest plot of radial forearm sensory dysfunction

Discussion and Conclusion

Donor-limb neurologic morbidity was identified following both radial forearm and anterolateral thigh free-flap harvest. Sensory dysfunction was more common than motor dysfunction at both donor sites, with pooled sensory deficit rates of 30% following radial forearm harvest and 19% following anterolateral thigh harvest, compared with motor dysfunction rates of 17% and 11%, respectively. These findings demonstrate that, although most patients recover without persistent neurologic impairment, a clinically meaningful proportion experience ongoing deficits.

Because these estimates were derived from separate single-proportion meta-analyses rather than from direct comparative analyses, differences in definitions of sensory and motor dysfunction, duration of follow-up, assessment methods, operative technique, and patient populations may contribute to variation across studies.

Our systematic review and meta-analyses establish comparative benchmarks of donor-limb motor and sensory morbidity following head and neck free-flap reconstruction. While the majority of patients do well following free-tissue harvest, a proportion experience persistent neurologic deficits at the donor site. Defining these complication profiles provides an evidence-based framework to support donor-site selection and improve preoperative counseling regarding expected functional outcomes.

References/Contact Info