

Selecting Target Vessels and the Location of Nerve Repairs In Facial Composite Tissue Allotransplantation

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Abstract

Background: This study explored the optimal location for arterial and venous anastomoses, as well as neurorrhaphies in facial composite tissue allotransplantation (CTA).

Methods and Materials: Case review of four face transplant recipients at Brigham and Women's Hospital (range of follow-up four to 30 months), plus preoperative planning sessions for 16 facial CTA candidates and cadaver studies.

Results: For the donor, the allograft is taken at the level of the external carotid artery (ECA) or common carotid artery (CCA) and the internal jugular vein (IJV). For the recipient, selecting target vessels is complex. Bilateral external carotid anastomoses can lead to oropharyngeal ischemia (1) due to the unique blood supply to the tongue by lingual arteries. Furthermore, in certain anomalies the ophthalmic artery can be primarily supplied by angular artery, which following diversion of bilateral external carotid arteries can lead to ocular ischemic syndrome. (2) Unilateral external carotid anastomosis appears to be safe, especially if performed distally to the lingual artery. Bilateral external carotid anastomoses are not recommended unless pre-operative imaging clarifies the communication between external and internal carotid artery angiosomes. In cases where the ophthalmic artery arises normally, we favor a unilateral ECA anastomosis and contralateral facial artery or ECA distal to the origin of the lingual artery. Bilateral IJV anastomoses provided venous outflow, however one should be performed in an end-to-side fashion to avoid cerebral edema.

For nerve repair, branches of the facial nerve should be re-connected as distally as possible. Neurorrhaphy at the trunk level leads to less targeted reinnervation and risks synkinesis. Reconnection of as many sensory nerves as possible should be performed because proprioception and sensory feedback is critical for cortical allograft functional re-integration. (3)

Conclusions: Selecting target vessels in the recipient is complex and requires preoperative imaging. Both motor and sensory nerve coaptation should be part of the operation.

References

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