

Vascular Supply of the Maxilla Harvested on the Facial Artery Pedicle for Facial Composite Allotransplant

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Background: Face transplant may become a viable alternative in the treatment in the patient with severe acquired facial deformity. In this study authors investigated the vascular supply of the maxilla harvested with a face transplant based on the facial artery pedicle.

Methods: Six faces were harvested from fresh human cadaver specimens in a surgical sub-periosteal plane for forehead and sub SMAS for the lateral cheek. The entire maxilla was harvested with the facial flap using a Lefort III osteotomy. Unilateral facial artery and vein were injected with contrast medium for three-dimensional CT angiography, then washed out and injected with latex for anatomic dissection.

Results: This preclinical study, including both radiology and anatomical dissection, confirm that the vascular supply to the central zone of the face is possible from a single facial artery pedicle (Fig 1). The ipsilateral and contralateral lateral cheek areas are more variable. All specimens presented an entire perfusion of the ipsilateral maxilla, while contralateral maxillar perfusion was observed in 66% of cases. Thus vascular supply of the maxilla is by means of the ascending palatine branch of the facial artery and the anterior branch of the ascending pharyngeal artery in addition to the rich mucosal alveolar anastomotic network overlying the maxilla. There was an accompanying artery along the infraorbital nerve and an artery penetrating the zygoma in a specific foramen close to the zygomatic major muscle insertion. The nasal bones, mucosa and turbinates were perfused in all cases.

Conclusion: Transplantation of the maxilla during a composite tissue allotransplant of the face based on a single facial artery is possible. This study demonstrates a simple technique for maxilla harvest and transplantation in severe trauma cases.



Fig.1 CT angiography of facial flap, where left facial artery was injected with contrast