

# Suitability of the Transverse Cervical Artery as a Recipient Vessel in Head and Neck Free Flap Microvascular Reconstruction

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**Disclosure:** No financial support was granted. None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

**INTRODUCTION:** The most commonly used recipient arteries for free flaps in the head and neck are branches of the external carotid artery. However, these can be compromised following neck dissection or previous radiotherapy<sup>1,2</sup>. Branches of the thyrocervical trunk may be a suitable alternative in these cases. We have investigated the suitability of the transverse cervical artery (TCA) for use as a recipient artery.

**METHODS:** 46 sides of neck from 23 cadavers were investigated. The optimal surgical technique for accessing the TCA was established. The origin, anatomical course and diameter of each TCA was determined. The distances from the origin of the TCA to the angle of mandible, the floor of the mouth and the mandibular symphysis were measured. Statistical analysis was conducted using a paired student t-test.

**RESULTS:** The TCA was present in both sides of the 23 necks investigated. Its anatomical course across the posterior triangle of the neck was constant between cases. Access to the vessel's origin was possible via a simple and reproducible surgical approach. The mean distances from the origin of the TCA to the angle of mandible, the floor of the mouth and the mandibular symphysis were 10.0cm, 9.2cm and 12.6cm respectively. There was no significant difference in distances measured between the left and right sides of the neck ( $p>0.05$ ). Distance from the TCA origin to the angle of the mandible and floor of the mouth was significantly longer in males than in females ( $p=0.03$  and  $p=0.004$  respectively), which correlated directly with increased heights of males ( $p=0.0004$ ). The mean diameter of the TCA was 2.2mm (SD 0.47).

**DISCUSSION:** The TCA can be accessed consistently, safely and efficiently. Its mean diameter is greater than 2mm which is the threshold above which primary end-to-end microsurgical anastomosis has reduced risk of anastomotic failure<sup>3</sup>. Distances from the major surgical landmarks within the neck are shorter than the potential length of commonly used donor vascular pedicles, which range up to 13.2cm for ALT flaps<sup>4</sup> and 18.0cm for radial forearm flaps<sup>5</sup>. Therefore we propose the TCA as a suitable recipient artery in head and neck free flap transfer, particularly when branches of the external carotid artery are not a viable option.

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