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Low Bifurcation of the Superficial Temporal Artery: A Rare Variant Anatomical and Clinical Insights from a Cadaveric Dissection

SEBASTIAN COTOFANA^{1,2,3}, IMMACOLATA BELVISO⁴, JACOPO JUNIO VALERIO BRANCA⁵, NICCOLO' FAGNI⁶, JAMILA ATANNAZ⁷, MIKAELA V. COTOFANA⁸, FERDINANDO PATERNOSTRO⁵

¹Department of Plastic and Reconstructive Surgery, Guangdong Second Provincial General Hospital of Jinan University, China

²Department of Plastic Surgery, Vanderbilt University Medical Center, Nashville, TN, USA

³Centre for Cutaneous Research, Blizard Institute, Queen Mary University of London, London, UK

⁴Department of Psychology and Health Sciences, Telematic University Pegaso, Naples, Italy

⁵Department of Experimental and Clinical Medicine, University of Florence, Florence, Italy:

⁶Otorinolaringoiatry, Azienda Ospedaliero-Universitaria Senese (AOUS), 53100 Siena, Italy

⁷Atannaz Center for Plastic and Reconstructive Surgery, Casablanca, Morocco

⁸Cotofana Anatomy, Rochester, MN, USA

The superficial temporal artery (STA), a terminal branch of the external carotid artery, is a critical landmark in both surgical and diagnostic procedures. Typically, the STA bifurcates into frontal and parietal branches approximately 3–4 cm superior to the zygomatic arch, with the frontal branch following an oblique upward and forward trajectory. However, anatomical variants of this bifurcation may have significant clinical implications. In this dissection performed on a 78-year-old male cadaver, we observed an early and low bifurcation of the STA's frontal branch, along with precise measurements of the main arterial segments. This study expands our understanding of vascular variants and their practical relevance.

Materials and Methods: A detailed dissection of the temporal region was conducted on a 78-year-old male cadaver. The main arterial and venous branches of the region were identified and isolated. Millimeter-scale measuring tools and high-resolution photography were used to document the pathways and bifurcations of the STA branches, with particular attention to the frontal branch morphology and its variants. Measurements were compared with data from the literature (Nakajima et al., 1995; Kim et al., 2011; Lee & Jang, 2014; Nash & Burchiel, 1999).

Results and Discussion: Dissection revealed an early bifurcation of the STA, with the frontal branch dividing into two distinct branches at a lower level than usual. The superior frontal branch measured approximately **2.53 cm**, while the inferior/accessory frontal branch measured approximately **1.61 cm**. The common STA trunk before bifurcation measured approximately **2.0 cm**. These branches ran parallel along the superior orbital margin, deviating from the typical oblique trajectory. Such a configuration, reported in the literature with an incidence of up to 20–30%, has important clinical implications:

- **Aesthetic and reconstructive surgery:** This prominent variant may increase the risk of vascular injury during temporal lift procedures or hair transplant surgeries.
- **Regional anaesthesia:** Nerve blocks may be less effective due to the atypical vascular distribution.
- **Imaging and vascular pathology:** The presence of variants may complicate angiographic interpretation and the management of conditions such as temporal arteritis (Horton's disease).

Conclusions: The observed variant, characterized by an early and low frontal bifurcation of the STA, underscores the importance of detailed knowledge of vascular variants in the temporal region. Awareness of such anatomical variations is essential for ensuring safety and precision in surgical, anaesthetic, and diagnostic procedures. Future studies, supported by dissections of larger samples, may further quantify the incidence and clinical impact of such variants.

References

- Fagni, N., Valli, L., Nittari, G., & Paternostro, F. (2025). *Superficial Temporal Artery: Anatomical Variation and Its Clinical Significance*. *Vascular Anatomy*, 4(2), 14.
- Nikolis, A., Enright, K. M., Troupis, T., Koutsilieris, M., Stratigos, A. J., Rigopoulos, D., & Cotofana, S. (2022). *Topography of the Deep Temporal Arteries and Implications for Performing Safe Aesthetic Injections*. *Journal of Cosmetic Dermatology*, 21(2), 608–614.
- Rusu, M. C., Jianu, A. M., & Rădoi, P. M. (2021). *Anatomic Variations of the Superficial Temporal Artery*. *Surgical and Radiologic Anatomy*, 43(3), 445–450.
- Koziej, M., Trybus, M., Hołda, M., Wnuk, J., Polak, J., Brzegowy, P., Popiela, T., Walocha, J., Tomaszewski, K., & Chrapusta, A. (2019). *The Superficial Temporal Artery: Anatomical Map for Facial Reconstruction and Aesthetic Procedures*. *Aesthetic Surgery Journal*, 39(8), 815–823.
- Ingallina, F., Botti, G., & Cotofana, S. (2022). *The Fascias of the Forehead and Temple Aligned – An Anatomic Narrative Review*. *Clinics in Plastic Surgery*, 49(1), 1–12.

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