6-14-2021

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Recommended Citation

Surek CC. Commentary on: The Course of the Angular Artery in the Midface: Implications for Surgical and Minimally Invasive Procedures. *Aesthetic Surgery Journal*. 2021; 41(7). doi: 10.1093/asj/sjaa234.

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Aesthetic Surgery Journal
2021, Vol 41(7) 814–815

DOI: 10.1093/asj/sjaa234
www.aestheticsurgeryjournal.com
OXFORD UNIVERSITY PRESS

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Editorial Decision date: July 30, 2020; online publish-ahead-of-print September 18, 2020.

There are very few absolute truths when it comes to anatomy, particularly facial anatomy. One absolute truth, however, is that anatomy is inherently variable, especially the vascular anatomy of the face. With the continued increase in injection procedures for facial rejuvenation, the looming fear of injected-related vascular compromise prompts continued investigations into arterial mapping.[1] The modern-day injector should have a keen understanding of the symphony of structures that comprise the facial architecture, including fat compartments, potential spaces, ligaments, vessels, and lymphatics.[2] Of these aforementioned structures, it is the vasculature that continues to demonstrate the greatest variability.

The traditional method of cadaveric dissection has provided initial topographic "commonalities" and a basic 2-dimensional depiction of the facial artery course.[3] However, the utilization of computed tomography (CT) imaging and ultrasound technology has allowed us to step into the 3-dimensional realm of arterial mapping. I want to commend these authors on designing and executing a state-of-the-art study to systematically examine the angular artery between the nasal ala and medial canthus.[1] Aging studies have taught us that visible changes occur in the pyriform, and therefore volumization of the anterior cheek and pyriform is a common injection procedure.[4] The question is, however, at what depth is injection "safe?" The answer, of course, is that no depth is completely safe from vascular compromise; however, deep on the bone still appears to be the best option. This study corroborates this already prevailing clinical assumption.

The results from this paper also confirm previous observations of a consistent relationship between the angular artery and the superficial musculoaponeurotic system (SMAS) at the nasal ala.[1] As a matter of fact, the challenge with this CT imaging modality is that due to the muscular investment of the artery, it can be difficult to fully visualize the artery in this plane. Coincidently, this CT-imaging limitation serves as further confirmation of this "SMAS principle" of the angular artery at the pyriform. The caveat to this principle is that up to 33% of the Russian Caucasian patients in this study exhibited a branch of the artery deep to the SMAS. It also demonstrated 4 possible branches of the artery at this level with 29.2% of patients demonstrating 2 or more branches. It is true that the lack of ethnic diversity is a study limitation; however, the demographic distribution in regard to age and body mass index (BMI) was quite broad in the study sample. Therefore, one can clinically deduct that despite placing the needle deep on bone in the pyriform fossa, there is still a potential risk for vascular injury. The take-home message is that techniques incorporating proper needle aspiration and slow deliberate injection are recommended safeguards to help detect and prevent this untoward outcome.

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As the angular artery ascends above the alar base in the anterior cheek, the authors found a gentle rise of the artery superficially into the subcutaneous tissue, first traveling in the pre-maxillary space and eventually within the superficial nasolabial fat pad. Interestingly, they found a direct correlation between BMI and age relative to the arterial depth within the subcutaneous plane. For the age component, the authors postulate this is not related to "enlarging" of the superficial fat compartments with age but rather a caudal descent and subsequent volume shift. This observation is an important distinction to point out in regard to our current understanding of aging facial anatomy. For the BMI component, it simply demonstrates that larger BMIs have thicker fat pads and therefore a deeper depth of the artery relative to the skin. The clinical significance of these correlations to the injector is not yet clear, because many injectors do not target the alar facial groove or superficial nasolabial fat compartment for volumization. However, this conclusion does demonstrate a subunit in the face where the facial artery is not intimate the SMAS and if/when injectors ever target this region, it is important for them to understand the artery is subcutaneous.

Lastly, the authors found the artery very superficial at the level of the medial canthus and tear trough. This observation points to the importance of depth control and injection placement when approaching the tear trough for rejuvenation.

This published work is one more step in the long journey towards facial arterial mapping. It further confirms that injectors of all levels should have a healthy respect for vasculature variation, both 2-dimensionally and 3-dimensionally. Ultimately, these conclusions suggest that continued emphasis should be placed on injecting the supraperiosteal (deep) plane when augmenting the anterior cheek at the level of the pyriform and the tear trough.

Disclosures

The author is a consultant for Galderma (Lausanne, Switzerland), Allergan (Dublin, Ireland), and Cypris Medical (Chicago, IL).

Funding

The author received no financial support for the research, authorship, and publication of this article.

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