Relationship of the Zygomatic Facial Nerve to the Retaining Ligaments of the Face: The Sub-SMAS Danger Zone

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Background: The transition zone between cheek superficial musculoaponeurotic system (SMAS) and malar SMAS is difficult to raise because of proximity of zygomatic nerve branches. The authors attempted to clarify the three-dimensional anatomy of the retaining ligaments in relation to nerve branches in this area.

Methods: Facial dissection was performed on 22 cadaver hemifaces. The zygomatic and masseteric retaining ligaments and the zygomatic and buccal facial branches in the area of dissection were identified. Ninety-five percent confidence regions for the locations of the zygomaticus major origin and the main zygomatic retaining ligament and upper masseteric retaining ligament were created.

Results: The distribution, density, and size of the retaining ligaments varied. The main zygomatic and upper masseteric retaining ligaments were located at a mean distance of 44.91 ± 9.72 mm and 46.35 ± 8.34 mm from the tragus. An upper zygomatic branch passed between the main zygomatic and the upper masseteric retaining ligaments and was always located deep (4.07 ± 1.29 mm) in the sub-SMAS plane of dissection and passed deep under the upper third of the zygomaticus major muscle. An inferior zygomatic branch passed inferior to the upper masseteric retaining ligament or penetrated its inferior margin (54 percent of cases) and was located more superficially (1.41 ± 0.95 mm), becoming visible just distal to the ligament.

Conclusions: Despite anatomical variation, the main zygomatic and upper masseteric retaining ligaments create a safe passage in between, through which a zygomatic facial branch passes deep. The area of danger is immediately inferomedial to the upper masseteric retaining ligament, where a zygomatic branch becomes superficial and vulnerable. (*Plast. Reconstr. Surg.* 131: 245e, 2013.)

Understanding nuances of the anatomy of the superficial musculoaponeurotic system (SMAS) and associated structures is the best means of minimizing facial nerve injury during sub-SMAS surgery. Although zygomatic and upper masseteric ligament release is necessary for effective midface elevation, this needs to be done with care because of the proximity of zygomatic nerve branches. A number of studies have expanded our knowledge of complex anatomical relationships of the facial nerve,[1–9] SMAS, and retaining ligaments of the face.[10–20] These studies have facilitated our execution of the procedure, shifting our attention from knowing where the nerve "is not" to affirming where the nerve "is" in a three-dimensional sense.[21]

Furnas provided the first detailed description of the cutaneous ligaments of the face. He described the zygomatic ligaments as originating from the lower border of the zygomatic arch, observing that one of the upper rami of the zygo-

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