Discussion

Surgical Anatomy of the Ligamentous Attachments of the Lower Lid and Lateral Canthus

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Surgical Anatomy of the Midcheek and Malar Mounds

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Discussion by David M. Knize, M.D.

These articles are published as a two-part series. The articles both address anatomy of the orbital and cheek areas, but each has a distinctly different focus.

The first article is concerned with the ligamentous attachments of the lower eyelid and lateral canthus. As these authors state, for at least 30 years surgeons have been using the lateral and inferior-lateral orbicularis oculi muscle and the fascial planes deep to that muscle in canthopexy procedures to successfully suspend the lateral canthus.[1–3] The authors' goal in publishing this article was to better define the anatomy manipulated by earlier surgeons who did not have a precise understanding of it. That was my objective as well when I reported my exploration of this anatomy.[4] These authors, however, have extended the level of anatomic detail beyond my efforts, and they include their concept of the anatomic relationships along the inferior orbital rim. My observations were confined to the lateral orbital region, and I concluded, as did the authors, that the lateral canthus could be suspended adequately to complement most aesthetic procedures without the complexities associated with manipulating the lateral canthal tendon.[4]

The basic anatomic concepts involved here are relatively simple. A connective tissue plane superficial to the lateral canthal tendon, the septum orbitale, supports the lateral canthus. The plane of the septum orbitale is continuous with the deep galea plane over the frontal bone,[5] and it is similarly continuous with the plane of the superficial temporal fascia that extends inferiorly from the temporal fossa.[4] The deep surface of the septum orbitale is fixed to the anterior surface of the orbital rim, and its superficial surface is fused to the orbicularis oculi muscle with its overlying skin. Therefore, if the plane of the septum orbitale is freed from the lateral and inferior-lateral orbital rims, it can be moved cephalad several millimeters with its overlying soft tissues that include the lateral canthus. From an examination of this anatomy, shown in my Figure 1, it is clear that the lateral canthus can be transposed cephalad without altering the lateral canthal tendon.

Although naming parts of the septum orbitale plane adds complexity, it can serve as a

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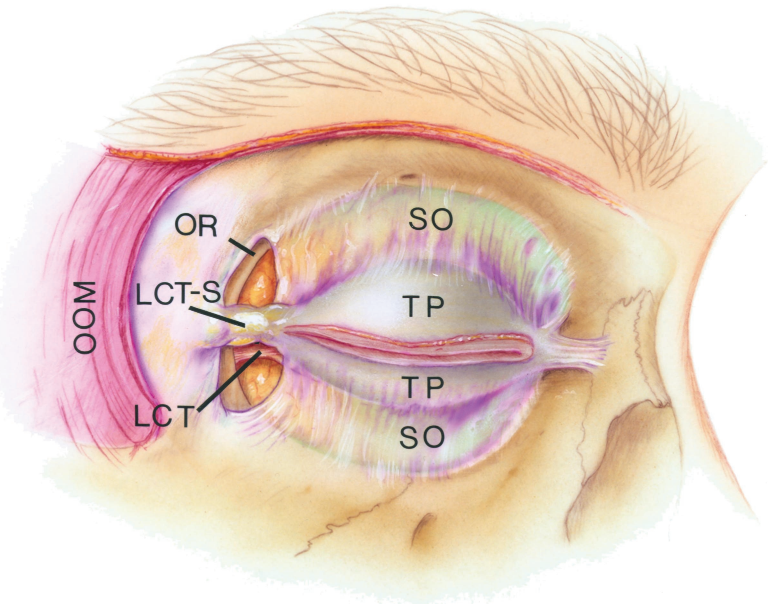

FIG. 1. Periorbital fascial relationships. Labeled are the margin of the lateral orbicularis oculi muscle (*OOM*) remaining after the muscle was removed from the surface of the septum orbitale plane; the septum orbitale (*SO*); tarsal plate (*TP*); the orbital rim (*OR*); and lateral canthal tendon (*LCT*), seen through incisions in the septum orbitale; and the "superficial lateral canthal tendon" (*LCT-S*), which corresponds to the *LOT* in Muzaffar et al.'s Figure 8. Note that the lateral canthal tendon is clearly a separate structure from the superficial lateral canthal tendon. (Modified from Knize, D. M. (Ed.), *Forehead and Temporal Fossa: Anatomy and Technique.* Philadelphia: Lippincott Williams & Wilkins, 2001. Pp. 60–62.)

communication tool. For example, the authors call the area of the septum orbitale plane lateral to the orbital rim the "lateral orbital thickening." This label is descriptive, because that area is thicker than the rest of the septum orbitale plane. Whereas they visualized this thicker area as being triangular, I saw it simply as a transversely orientated thickening and called it the "superficial lateral canthal tendon." The authors did conclude that the lateral orbital thickening area became smaller with advancing age, suggesting that the shape of the area may not be important. Whichever name is used, it helps the reader understand the location of this specific area. Like the deeper lateral canthal tendon, the lateral orbital thickening is fixed to the tarsal plate. This relationship is shown in my Figure 2, which provides another view of how the lateral canthus can be moved without disturbing the lateral canthal tendon. Note how the relationships shown in Figures 1 and 2 correspond closely to those shown in Muzaffar et al.'s Figure 8. The authors provide us with another perspective of the lateral orbital anatomy that further defines this area and facilitates appreciation of canthopexy/canthoplasty techniques.

As an additional part of their anatomic study, the authors described a thin, lax membrane, the "orbicularis retaining ligament," which they visualized as bonding the orbicularis oculi muscle to the septum orbitale along the inferior orbital rim. They suggested that release of the orbicularis retaining ligament

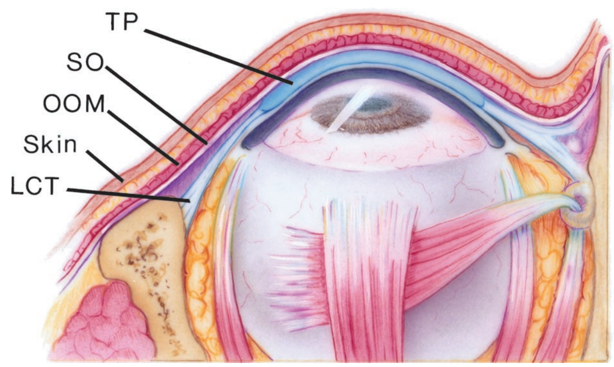

FIG. 2. Cross-sectional diagram of the orbit. The lateral canthal tendon (*LCT*) connects the lateral end of the tarsal plate (*TP*) to the inner surface of the lateral orbital rim. Note that the septum orbitale (*SO*) is fused to the anterior surface of the tarsal plate and that it attaches to the anterior surface of the lateral orbital rim with its overlying orbicularis oculi muscle (*OOM*) and skin. When the septum orbitale is freed from the lateral orbital rim, it can be transposed cephalad with its overlying skin, which includes the lateral canthus, without moving the deeper lateral canthal tendon. (Modified with permission from Codner, M. A., McCord, C. D., and Hester, T. R. The lateral canthal tendon. In Knize, D. M. (Ed.), *Forehead and Temporal Fossa: Anatomy and Technique.* Philadelphia: Lippincott Williams & Wilkins, 2001. P. 61.)

along with the lateral orbital thickening from the orbital rim was necessary to free the lateral canthus for canthopexy. In my experience, however, adequate mobility of the lateral canthus is obtained when soft-tissue release from the lateral orbital rim stops just medial to the inferior-lateral level of the rim. The authors defined an orbicularis retaining ligament in all six of the cadaver specimens studied, but they could not demonstrate this structure histologically. Without histologic evidence, it was unclear how a plane described as being as thin as 1.5 mm was determined to be a bilaminar membrane consisting of a fat layer separating the reflection of the septum orbitale plane on its cephalad surface and the prezygomatic fascia plane on its caudad surface (as shown in Muzaffar et al.'s Figure 2). They did show histologic evidence of fibrous bands between the orbicularis oculi muscle and the overlying dermis at the level of the inferior orbital rim. They also showed histologic evidence of fibrous bands seen extending from the deep surface of the orbicularis oculi muscle to the bony rim. Although the concept of the orbicularis retaining ligament as illustrated in the authors' Figure 2 is attractive and logical, I could not conclude from the presented combined gross and histologic data whether a distinct structure (orbicularis retaining ligament) exists as described or only seems to exist through the effect of the observed connective tissue bands between the inferior orbital rim and dermis.

In the second article, the authors used the same cadaver material examined for the first article to do an additional study. The second article is concerned with midcheek anatomy, including the structures that contribute to the formation of the malar mound. The authors provide anatomic observations that define this area more clearly than any previous work. They describe a glide plane space over the zygoma and the maxilla that is devoid of branches of the facial nerve. This space provides access to the upper midcheek, where midface suspension sutures can be placed. Application of this detailed information has proven clinical value in that the senior author (B.C.M.) has used the described anatomic approach for midface suspension in his personal facialplasty procedure for several years.[6] The article provides the reader with the anatomic concept on which this procedure is based, and it describes how to minimize risk. This information alone would have justified publishing the article.

The authors provide the reader with an additional thoughtful discussion of an anatomic condition whose basis has been poorly understood and whose successful treatment has eluded most surgeons in the past. We are given a working concept of how the malar mound forms and how to treat it. The authors state that the treatment should include a vertical transposition of the orbicularis oculi muscle within the upper cheek superficial musculoaponeurotic system (SMAS). They concluded that vertical resuspension of the upper cheek SMAS can be accomplished most effectively using a temporal scalp incision approach with dissection extending along the lateral orbital rim to provide for cephalad transposition of the lower orbicularis oculi muscle. It will be interesting to see if wider application of this concept by other surgeons has an impact on the malar mound problem clinically. Again, this discussion of the malar mound alone would have justified publishing the article.

Both articles in this series are important contributions to the surgical literature. The authors deserve our gratitude for the painstaking work required to further explore and describe these poorly defined anatomy of areas of the face so often subjected to surgical procedures. Their work has advanced our appreciation of facial anatomic relationships. The basis for doing surgery comfortably and safely is a clear understanding of the local anatomy, and these authors have served us well to further that understanding.

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