Cosmetic

Surgical Anatomy of the Midcheek and Malar Mounds


Melbourne, Australia, and Dallas, Texas

The anatomy of the midcheek has not been satisfactorily described to adequately explain midcheek aging and malar mounds, nor has it suggested a logical approach to their correction or provided sufficient detail for safe surgery in this area. This cadaver study, which was complemented by many operative dissections, located a missing link: a glide plane space overlying the body of the zygoma. The space functions to allow mobility of the orbicularis oculi, where it overlies the zygoma and the origins of the elevator muscles to the upper lip. The space is a cleft between the sub–orbicularis oculi fat and the preperiosteal fat and is lined by a fine membrane. The anatomic boundaries are clearly defined by retaining ligaments, which correlate with the triangularity of the space. Several anatomic features provide the functional characteristics of the prezygomatic space, including the (1) absence of direct attachments between the orbicularis in the roof to the floor, (2) more rigid inferior boundary formed by the zygomatic ligaments, and (3) more mobile upper ligamentous boundary formed by the orbicularis retaining ligament (separating from the preseptal space of the lower lid). These components determine the characteristic aging changes that occur in this region and explain much about malar mounds. An appreciation of this anatomy has several surgical implications. The prezygomatic space is a junction area that can be approached from the temple, lower lid, and cheek. The zygomatic branches of the facial nerve to the orbicularis do not cross the space; rather, they course in the walls and in the sub–orbicularis fat within the roof of the space. (Plast. Reconstr. Surg. 110: 885, 2002.)

Malar mounds have acquired some notoriety for their persistence in the face of surgical efforts to remove them.

—D. Furnas

Correction of the midcheek is currently recognized to be of fundamental importance in facial rejuvenation surgery. To date, the descriptions of the intrinsic anatomy of this region have been unable to explain its aging changes and insufficiently detailed to provide for predictably safe, and possibly even logical, surgical correction of this area. This is a key reason that the subperiosteal plane has been the preferred level of dissection in surgical rejuvenation of the midcheek. In common usage, the term midcheek refers to that part of the cheek medial to a line extending from the frontal process of the zygoma to the oral commissure and from the lower lid above to the nasolabial fold below. Although the midcheek may appear externally as a uniform structure, in fact, it is composed of two functionally distinct parts, the prezygomatic part that overlies the skeleton of the midcheek (body of the zygoma and maxilla) and the infrayzygomatic part below that covers the vestibule of the oral cavity. The skeleton underlying the midcheek is the major determinant of the shape of the midcheek, because it both separates and connects the orbital and oral cavities. The sphincter muscles that enclose these bony cavities (orbicularis oculi and orbicularis oris) share the bony platform of the midcheek for their limited skeletal attachments, as do the retaining ligaments associated with each muscle.

The aging changes that appear in the midcheek largely reflect the effect of laxity and ptosis of the soft tissue mass of the cheek relative to the underlying skeleton. Because the soft tissue mass is thinner above, the ptosis appears as a volume displacement. This affects the upper prezygomatic part by uncovering the anatomy of the orbit, such that the lower lid fat

From the Department of Plastic Surgery, University of Texas Southwestern Medical Center, and from Melbourne, Australia. Received for publication July 27, 2001; revised November 1, 2001.


DOI: 10.1097/01.PRS.0000019706.34235.E5

Copyright © American Society of Plastic Surgeons. Unauthorized reproduction of this article is prohibited.
bulges become revealed (whether they are normal or excessive in amount) and the bony orbital rim becomes uncovered. The junction between the lid and cheek, which formerly was indistinct, becomes quite defined with the appearance of a palpebromalar groove inferolaterally and a nasojugal groove medially. These confluent grooves become increasingly prominent with further descent of the lid-cheek junction. The displaced volume accumulates in the infrazygomatic part of the cheek, most evident as increasing fullness of the nasolabial fold.

Changes in the shape of the cheek accompany the tissue descent. Whereas youthful cheeks characteristically have a rounded fullness maximal over the prominence of the zygoma, the volume changes associated with aging progressively flatten the fullness and eventually form an infrazygomatic concavity. This is the midcheek furrow, which is a continuation of the nasojugal groove downward and outward. The furrow bisects the soft tissues overlaying the prezygomatic part of the midcheek at an angle so that the lateral segment overlying the zygoma becomes triangular, being bounded above by the palpebromalar groove. When visibly enlarged this part forms the clinical entity described as malar mounds, also termed malar bags and malar crescent. This discrete entity should be distinguished from the malar fat pad, a term used to describe the subcutaneous fat that gathers medial to the midcheek furrow and exaggerates the nasolabial fold. The anatomic basis for malar mounds has not been satisfactorily defined, which may account for their unpredictable response to surgical correction.

When surgery involving the superficial musculoaponeurotic system (SMAS) was introduced, it was not considered safe to extend the SMAS dissection into the area of the midcheek, notwithstanding the earlier excursion of Skoog into the infrazygomatic part. Although it provided a significant benefit to the lateral cheek and jawline, this limited SMAS surgery had minimal impact on the midcheek. Surgery of the midcheek developed subsequent to the descriptions of the retaining ligaments of the cheek when the focus in face lift surgery had extended to correction of the nasolabial fold. Release of the masseteric-cutaneous and the lateral zygomatico-cutaneous ligaments enabled the SMAS to correct the infrazygomatic part of the midcheek. However, when only that portion is corrected and the prezygomatic part is not similarly corrected, a disharmony arises. Currently, there are several different approaches to the prezygomatic region in clinical practice.

The prezygomatic SMAS can be bypassed by changing the plane of dissection over the midcheek. The new plane can be on the outer surface of the orbicularis oculi with elevation of the subcutaneous fat (the malar fat pad), which is then repositioned independently of the underlying SMAS. The superiosteal plane is also used to bypass the SMAS of the midcheek. When the “deep plane” of dissection is used for correction of the lateral and infrazygomatic SMAS, it is logical to extend the plane so that the resultant SMAS flap now includes the prezygomatic SMAS (which here is largely the orbicularis oculi and its fasciae). Previously, concerns about the risks of facial nerve injury had discouraged this approach until it was recognized that a “safe interval” exists between the temporal and zygomatic facial nerve branches overlaying the zygoma. This area has subsequently been described as a surgical “safe space.” Although the boundaries of the space have not been specifically defined, it is used in several face lift techniques. The safe-space approach to the prezygomatic SMAS can also be by entering directly through the lower lid and temple independent of the lateral cheek.

**MATERIALS AND METHODS**

This is the second segment of a two-part anatomic study in this issue using the same cadaver material and methods described in the preceding article. In addition, the detailed observations from the precise surgical dissections of hundreds of face lift, temporal lift, and midcheek procedures (performed by the senior author (B.C.M.) have provided supplementary information.

**RESULTS**

The part of the orbicularis oculi that continued into the cheek (pars orbitalis) was extensive and situated immediately deep to the subcutaneous fat. The thickness of the fat layer notably increased as the dissection proceeded inferiorly from the lid margin. The muscle fibers were seen as loops that extended a variable distance down the cheek. Rather than being semicircular and concentric to the lid margin, as expected from textbook illustra-
tions, the lower fibers took a more elliptical course and extended along the summit of the nasolabial fold, where for a distance, the muscle fibers were close and parallel to the nasolabial crease. Inferior to the zygoma the orbicularis was less clearly defined because the more inferior loops of muscle were thinner and somewhat dispersed without the muscle layer having a well-defined lower edge. Here the muscle layer was so thin as to be almost lost in the thickness of the surrounding fat (i.e., both superficial and deep to the muscle layer). The fascia associated with the orbicularis muscle layer is less defined on the subcutaneous surface than on the deep surface and is grossly minimal in the cheek.

In the prezygomatic region the fat deep to the orbicularis oculi is arranged in two well-defined strata (Fig. 1), separated by a natural cleavage plane. A thin, transparent membrane adheres tightly to the outer surface of the deeper layer of fat. The seemingly complex anatomy of this area can be more simply described in terms of an actual prezygomatic space having a floor and a roof connected by walls or borders above (cephalad) and below (caudal).

The origins of the three elevator muscles of the upper lip (i.e., zygomaticus major, zygomaticus minor, and levator labii superioris) tend to follow the curvature of the lower border of the underlying bone, which narrows medially toward the orbital rim. Accordingly, the line of origin is in the form of a crescent, concave above with the medial end higher than the lateral (Figs. 2 and 3) The medial end of the origin of the levator labii superioris extends virtually to the orbital rim. From there the broad line of the levator origin inclines at an angle of nearly 45 degrees away from the orbit. The narrow origin of the zygomaticus minor (4.0 to 5.0 mm wide) is the lowest point of the crescent from the orbital rim. The origin of the more significant zygomaticus major (8 to 10 mm wide) is located higher on the zygoma (at least halfway up). Between this origin and the zygomatico-facial foramen (or foramina), which is considerably closer to the orbital rim...
(5 to 10 mm), there is a significant space of "exposed" bone 15 mm or more in width.

Adhering strongly to this area of bone is the deeper of two layers of fat. This preperiosteal fat forms a carpet-like padding approximately 2 1/2 to 3 mm thick and is distinguished by its location and its appearance; it has a pale color and coarse lobulation. The preperiosteal fat layer not only covers the exposed bone, but it also extends inferiorly between the muscles and covers the origins and bellies of the muscles for some distance, becoming progressively thinner as it spreads onto the muscles. This arrangement has the effect of concealing the actual muscle origins so that the muscles appear to have emerged from a carpet of preperiosteal fat. The thin transparent membrane that adheres to the preperiosteal fat also extends inferiorly over the muscles. As a result of this arrangement, the floor of the prezygomatic space is broader than expected; it not only overlies the bone but it also extends over the proximal ends of the muscles. Because of the concealment by the preperiosteal fat, the extent of the muscles under the floor is more than may be expected. When blunt dissection is used in this area, as with a sweeping motion of a blunt instrument, the smooth outer surface of the membrane stays intact and the underlying preperiosteal fat remains adherent to the bone. The membrane extends beyond the floor of the space, reflecting outward to line the walls.

The inferior wall of the prezygomatic space is lined by the continuation of this membrane as it leaves the surface of the muscles inferior to their origins and then sweeps more superficially into the soft tissues of the cheek (Fig. 4). The most cephalad of the zygomatico-cutaneous retaining ligaments that take origin between the muscles are located directly inferior, and provide reinforcement, to the membrane so that there is a strong inferior boundary of the space. For the dissection to extend inferiorly from within the prezygomatic space into the sub-SMAS space of the lower cheek, it is necessary to transect this ligamentous barrier. Whereas these ligaments have the prezygomatic membrane like a coating on their upper surface, the other surfaces are surrounded by soft, loose, yellow fat that is quite distinct from the firm, white preperiosteal fat. The zygomatico-cutaneous retaining ligaments extend outward through the subcutaneous layer to the dermis, whereas the muscles remain in the plane of their origins as they extend down to the lip. The histologic examination undertaken to show this arrangement was not well visualized. However, the histologic results from a related study (Fig. 5) demonstrated a significant difference in the architecture of the collagenous fibrous tissue superficial and deep to the orbicularis strata. In contrast to the perpendicular orientation of the retinacula cutis fibers in the subcutaneous layer, immediately deep to the orbicularis fascia a horizontal orientation suggests a cleftlike structure without direct attachment to the periosseum. A solitary or specific subcutaneous extension of the zygo-

**Fig. 3.** Dissection of the floor and upper border of the prezygomatic space. The thick carpet of preperiosteal fat and the overlying membrane of the floor of the space also conceal the origins of the lip elevator muscles zygomaticus major (Zmaj.), zygomaticus minor (Zmin.), and levator labii superioris (not shown). The upper blue spacer indicates how the temporal approach to the prezygomatic space passes deep to the lower temporal branches of the facial nerve (TFN) to the orbicularis. The zygomatico-facial nerve (ZFN) is the only structure crossing the space. For orientation purposes, the zygomatico-facial nerve is directly cephalad to the zygomaticus minor. The space narrows medially to a V and is broader laterally above the zygomaticus major. LOT, lateral orbital thickening; ORL, orbicularis retaining ligament; OO, orbicularis oculi in the roof of the prezygomatic space lined by sub- orbicularis oculi fat (SOOF).
matic ligaments or the membrane was not seen.

The orbital boundary of the prezygomatic space is formed where the membrane sweeps onto the underside of the septum-like orbicularis retaining ligament (described in detail in the preceding article). This ligament separates the prezygomatic space from the presepetal space of the lower lid and courses immediately on the orbital side of the zygomatico-facial foramen and nerve (Figs. 3 and 6). The ligament becomes significantly more substantial and less distensible as it ascends the lateral orbital rim to become expanded out as it merges into the lateral orbital thickening.

The medial end of the prezygomatic space becomes triangular before being closed off by the approximation of the medial end of the levator muscle origin to the orbicularis origin on the inferomedial orbital rim. The space extends lateral to the zygomatico-facial nerve and is closed at the root of the frontal process of the zygoma, well below the level of the lateral canthus, by the lateral orbital thickening (also described in the preceding article), which extends across the width of the frontal process of the zygoma onto the deep temporal fascia. The posterior border of the prezygomatic space has not been as clearly delineated in either its position or structure. It overlies the body of the zygoma at or near its junction with the arch of the zygoma. It seems that reinforcement of the posterior boundary is provided by

Fig. 4. The roof of the prezygomatic space (orbicularis oculi [OO] lined by suborbicularis oculi fat [SOOF]) has been opened by a horizontal incision; then the upper and lower flaps are grasped by forceps and reflected to show the floor and the upper and lower boundaries. The floor of the prezygomatic space is defined between the two continuous blue lines, which indicate where the membrane (PreZyg. Memb.) is reflected off the floor onto the upper border, formed by the orbicularis retaining ligament (ORL), and onto the lower border, where it directly overlies the upper surface of the zygomatic ligaments (ZL), nearest the space. The fenestrations through the membrane between these ligaments are dissection artifacts. The instrument is located immediately outside the space in the soft, yellow fat on the underside of the same retaining ligaments that form the inferior border. The zygomatic ligaments farther outside the space are not lined by the membrane. The motor nerve to the orbicularis courses outside the space in the interval between the ligaments, as indicated by the instrument.

Fig. 5. Histologic view of the cheek overlying the zygoma and proximal zygomaticus major. Retinacula cutis fibers (RC) extend from the fascia enclosing the orbicularis muscle (OO) to the dermis but do not extend deep to the orbicularis. Note the absence of a direct attachment of the orbicularis (the roof of the space) because of the prezygomatic glide plane (preZ) deep to the orbicularis, which here extends to the proximal part of the zygomaticus major (ZM) (Fialkov, J., and Mendelson, B., unpublished study).
the most anterior of the smaller zygomatic ligaments attached to the arch of the zygoma.

The roof of the prezygomatic space is formed by the orbicularis oculi (pars orbitalis), the underside of which is covered by the orbicularis muscle fascia, deep to which is a thin layer of fat quite distinct from the preperiosteal fat. This is the previously described sub–orbicularis oculi fat.28

The sub–orbicularis oculi fat is finely lobulated and distinctly yellow, in contrast to the preperiosteal fat, and is less strongly adherent to the orbicularis than is the preperiosteal fat and membrane to the periosteum of the zygoma. Coursing within the thin layer of sub–orbicularis oculi fat are multiple radiating branches of the zygomatico-facial nerve and vessels from above, and the motor branches to the orbicularis oculi. No structures cross the prezygomatic space, although the zygomatico-facial nerve and vessels are more at the upper boundary than within the space.

Several significant observations were made regarding the innervation of the orbicularis oculi. The zygomatic branches of the facial nerve that innervate the orbicularis oculi enter the pars orbitalis at or near its periphery and seem to do so in four distinct locations (Fig. 7). They originate off the main zygomatic branch, which remains at the “deep level” within the soft, yellow fat at the base of the zygomatic retaining ligaments. Ultimately, the several branches become more superficial as they enter the sub–orbicularis oculi fat on the underside of the orbicularis.

The nerve, previously considered the “main” innervation of the orbicularis oculi,29 separates from the zygomatic nerve well before the latter passes deep to the zygomaticus major. The nerve continues alongside the parent branch for a short distance before it diverges to become slightly more superficial and continue its directly horizontal course over the outer surface of the zygomaticus major, within a centimeter of the upper edge of the muscle origin. This orbicularis branch courses immediately outside the prezygomatic space as it passes on the inferior surface of the same zygomatic ligament forming part of the inferior boundary of the prezygomatic space, immediately lateral to the zygomaticus major. This orbicularis branch continues medially onto the surface of the zygomaticus minor (in some cases passing through the outermost fibers) to the medial border of the zygomaticus minor, where it abruptly changes course, from transverse to

Fig. 6. Dissection through the roof overlying the lateral extent of the prezygomatic space. The superficial fascia of the roof consists of the orbicularis oculi (OO), which is continuous with the temporoparietal fascia (TPF) over the temple. The orbicularis is lined by sub–orbicularis oculi fat (SOOF). The continuous blue line indicates the outward reflection of the smooth membrane on the preperiosteal fat onto the underside of the orbicularis retaining ligament (ORL). This ligament is confluent with the lateral orbital thickening (LOT) near the lateral canthus. The zygomatico-facial nerve (ZFN) is just inside the upper boundary.

Fig. 7. The pattern of innervation of the orbicularis oculi of the lower lid. The branches at 6 o'clock and 7 o'clock course from deep to the parotid–masseteric fascia to become superficial into the sub–orbicularis oculi fat in immediate proximity to the retaining ligaments, where indicated by the yellow arrows. Red arrows indicate the three common surgical approaches to the prezygomatic space.
vertical, to enter the sub–orbicularis oculi fat overlying the zygomaticus minor. It remains in this layer, in the ceiling of the space, as it ascends toward the lid margin.

An adjacent motor branch to the orbicularis is located in relation to the inferolateral corner of the prezygomatic space. This branch separates from the main zygomatic nerve more proximally, either within or just outside the parotid, and initially courses directly vertical to cross the lower border of the arch of the zygoma before coursing transversely in the depth of the fat immediately cephalad to the lower border of the zygomatic arch. This brings it immediately caudal to the most anterior of the smaller zygomatic arch ligaments, only 10 mm or so lateral to the main zygomatic ligament (Fig. 7). If the previously described main branch to the orbicularis is considered to be at 6 o’clock to the prezygomatic space, this branch is at 7 o’clock. Both branches to the orbicularis have similarities regarding their relationship to the prezygomatic space, being in intimate relationship to the ligament immediately cephalad and separated from the prezygomatic space by ligament. Another similarity is their change of course immediately after crossing the base of the ligament, where they pass outward into the inferior-lateral edge of the orbicularis.

Just below the level of the lateral canthus, several transversely oriented (lower temporal or upper zygomatic) branches continue their passage through the temporoparietal fascia into the orbicularis at about the level of the posterior border of the frontal process of the zygoma (i.e., 15 to 17 mm lateral to the lateral canthus). A medial branch to the orbicularis is located at the medial extent of the prezygomatic space near the medial side of the levator labii superioris. The origin of this small branch was not satisfactorily defined, but it seems to arise from the main zygomatic branch, which has been described as entering the levator labii superioris alaeque nasi,30 the angular nerve.

**DISCUSSION**

The three-dimensional arrangement of the soft tissues in the prezygomatic part of the cheek is unique in that it accommodates the merging of the dynamic and mobile tissues of the lower eyelid with those of the infrrazygomatic cheek (peri-oral). Accordingly, the prezygomatic space can be considered to be a transition zone. The skeletal attachments of the lower lid (orbicularis oc-
older patients. Presumably, this is because of the development of laxity of the fibrous connective tissue components of the walls and within the superficial fascia forming the roof.

The prezygomatic space provides for independent mobility of the orbicularis oculi in the roof of the space from the lip elevator muscles underlying the floor of the space and vice versa. The considerable movement of the skin of the lower lid and upper cheek that occurs on contraction of the orbicularis must be associated with an equivalent degree of displacement of the underside of the muscle. For the prezygomatic space to function to allow a gliding movement of the overlying orbicularis, the roof itself must be mobile and not directly attached to the underlying deep fascia.

Accordingly, it is only the peripheral attachments at the boundaries that stabilize the roof. The septum-like orbicularis retaining ligament of the upper boundary is considerably less strong than the zygomatic ligaments of the lower boundary. The limited rigidity of the ligament of the upper boundary allows for the significant movement that occurs across this boundary on orbicularis contraction, compared with the “fixation” of the lower boundary. In some ways, the prezygomatic space has similarities with the glide plane space that exists above the superior orbital rim deep to the lower part of the frontalis and orbicularis oculi.

The shape of the malar mounds, triangular with the apex medially, mirrors that of the underlying prezygomatic space, being defined by the same ligamentous boundaries. Laxity of tissue tone within the roof of the prezygomatic space seems to be the key to the presence and degree of malar mounds (Fig. 8) inasmuch as squinting causes the mounds to efface when orbicularis contraction tightens this layer and moves it superomedially.

The presence of a malar septum was deduced by Pessa and Garza and Pessa et al. to explain the several clinical entities associated with malar mounds. This delicate structure to the underside of the dermis of the lower boundary of the mound is difficult to visualize on histologic examination and was not specifically seen in our study, although there are considerable subcutaneous retinacula cutis attachments between the orbicularis (in the roof of the space) and the overlying dermis. The preperiosteal membrane can be seen quite clearly during some surgical dissections when it reflects off the outer surface of the preperios-
young people can only be postulated. Conceivably, there may be variations among individuals regarding the tone within the roof of the prezygomatic space either primarily or secondary to relatively poor support of the superior boundary. There is a recognized association between baggy, allergic lower lids and the presence of malar mounds, the common denominator being laxity of the orbicularis retaining ligament. The strength of the lower border (zygomatico-cutaneous ligaments) would be undiminished (because of the absence of aging laxity), leaving the mounds high and well defined. Another possible variation may be in the volume of fat contained within the space relative to the tightness of fixation, such that bulging of the roof is due to increased pressure within the space. The concept of natural variations is not without precedent, being observed in other situations in younger persons, such as constitutionally heavy nasolabial folds or low-set brows, with a tendency toward premature aging of the feature.

Swelling of malar mounds is often associated with swelling of herniated lower lid fat. There is an anatomic explanation for patients with this combination of bulges typically having a relatively worsened appearance of the malar mound after undergoing correction of the lower lid bulge alone. To accommodate the volume of herniated lid fat, there must be considerable distension of the orbicularis retaining ligament, and both of these factors would contribute to laxity of the roof of the prezygomatic space. Traditionally, a blepharoplasty corrects the displaced lid fat and tightens the anterior lamella of the lid (skin muscle flap), which may then contrast with (and thereby exaggerate) the uncorrected laxity of the roof of the malar mound immediately below (Fig. 8).

Numerous and diverse treatments have been advocated for the correction of malar mounds over the years, each directed to one of the component tissue layers. Restoration of skin tone has been approached by direct skin excision in selected cases. Laser resurfacing of the overlying skin has more recently been described as being notably successful in the treatment of mounds. Treatment directed to the fat layers has been advocated either by superficial liposuction of subcutaneous fat or direct excision of suborbicularis oculi fat. Excision of preperiosteal fat has also been performed. All fat excision techniques are associated with prolonged postoperative swelling. Excision of orbicularis muscle has also been suggested, as has direct excision of the full thickness of the lax tissue of the roof. Reducing the visible lower edge of the mound has also been suggested, using either soft-tissue filling (lipoinfiltration) or skeletal augmentation with a tear trough silicone implant. Transection of the membrane of the lower boundary at a superficial subcutaneous level has not been specifically described in the literature. However, transection at the deep subcutaneous level (junction of orbicularis oculi and subcutaneous fat) has been widely performed in the context of midcheek rejuvenation, but, disappointingly, it is associated with exaggeration of malar mound swelling for a prolonged period after surgery.

The predisposition to prolonged postoperative swelling is a characteristic of malar mounds and suggests a lymphatic origin, the basis of which is not resolved by this study. In the absence of a proven effective treatment for malar mounds, treatment should be directed to the correction of laxity in the roof of the prezygomatic space when this is present. The treatment of other components (e.g., fat excision or dermal tightening with laser resurfacing) should be complementary to the surgical restoration of tone within the roof. In the past, the extended lower lid blepharoplasty procedure has been described to correct this laxity.

Tightening of laxity of the orbicularis and its fascia logically should be performed according to the established principles of SMAS surgery. This first requires a complete release of the restraining effect of those ligamentous attachments that restrict the beneficial effect of SMAS redraping. In this context, the ligaments required to be released are those of the superior and superolateral boundaries of the prezygomatic space, namely, the lateral orbital thickening attachment to the frontal process of the zygoma and the confluent stronger lateral part of the orbicularis retaining ligament (where it still provides resistance.) The laxity of the roof of the space is then “taken up” by redraping the SMAS. The vectors for this correction require a predominantly vertical lift. Because this redraping of the upper cheek is beyond the effective range of a face lift, a temporal approach is required, not for the usual indication of elevating the position of the outer brow but rather so the vectors can be applied to the
upper lateral boundary of the prezygomatic space.

The absence of sufficient vertical correction is the reason malar mounds worsen when an infrrazygomatic face lift only is performed in the presence of laxity over the zygoma. Correction of the laxity of the prezygomatic region can be accomplished by inclusion of the SMAS of this area (i.e., the roof of the prezygomatic space) in the face lift flap and incorporation of a temporal lift. This is the anatomic basis for the composite SMAS face lift described by Hamra about 10 years ago, but extended to include the temporal SMAS (the complete composite face lift). Because the prezygomatic space is a junction area linking the lower lid, the lower temporal space, and the lateral and infrrazygomatic parts of the cheek, in surgery the prezygomatic space can be approached and defined from all but the last direction. It provides the common anatomic pathway for the midcheek correction achieved by a deep temporal lift and face lift and for the preperiosteal midcheek lift performed through the lower lid approach. These can be performed as solitary procedures or in combination.

Damage to the innervation of the orbicularis oculi is the only significant risk when operating in this region. The multiple motor branches to the orbicularis are “at risk” where they cross from the deeper facial plane to the more superficial plane of the orbicularis in the lower and lateral boundaries of the prezygomatic space. This is where they are under the “protection” of retaining ligaments. From there the branches continue in the plane of the suborbicularis oculi fat to the preseptal part of the orbicularis. The lower lid and temporal approaches are relatively safe as they enter the prezygomatic space from above, on either side of the zygomatico-facial nerve, and do not encounter the zygomatic branches. However, the temporal approach has the potential for a traction neurapraxia of the lowest temporal branch to the lateral canthus, because it courses immediately posterior to a zygomatic arch ligament (Fig. 7).

The SMAS face lift approaches the prezygomatic space through the inferolateral boundary, where it is necessary to dissect in the narrow interval between two ligaments, the major zygomatic ligament immediately lateral to the zygomaticus major and the most anterior of the zygomatic arch ligaments. Because of the proximity of the two nerves of the orbicularis to these ligaments, releasing these ligaments from the facial skeleton has the potential risk of damage to the innervation of the orbicularis. This risk is present not only when the SMAS face lift approach is used to access the prezygomatic space but also when dissection is extended through the lower boundary of the prezygomatic space to correct the infrrazygomatic region of the cheek; i.e., release of the zygomatic ligaments at the inferolateral corner of the prezygomatic space is associated with this risk regardless of the surgical approach to the prezygomatic space.

The zygorbicular face lift approach was developed in recognition that the lower lid provides a simpler and safer approach to the midface, through the area now known to be the prezygomatic space, and possibly a safer approach to release of the zygomatic ligaments.

**Conclusions**

- The triangular prezygomatic space is a junction area between the lower eyelid (above), the lower temple (superolaterally), the lateral cheek, and the infrrazygomatic part of the cheek (below).
- The roof of the prezygomatic space contains the orbicularis oculi (pars orbitalis).
- Two distinct layers of fat exist deep to the orbicularis muscle fascia separated by a prezygomatic space.
- The suborbicularis oculi fat is superficial to the prezygomatic space, and the preperiosteal fat is deep in the floor of the space. A distinct membrane is firmly attached to the preperiosteal fat.
- The only anatomic structure crossing the prezygomatic space is the zygomatico-facial nerve, crossing immediately adjacent to the thicker part of the orbicularis retaining ligament.
- Malar mounds, defined by the ligamentous boundaries of the underlying prezygomatic space, reflect the laxity of the roof of the space.
- The zygomatic motor branches to the orbicularis oculi course from deep to superficial immediately outside the prezygomatic space.
- The zygomatic motor branches to the orbicularis oculi enter the suborbicularis oculi fat near the periphery of the orbicularis and traverse within the suborbicularis oculi fat in the roof of the space.
• Of the three surgical approaches to the prezygomatic space, the lateral approach (face lift) is the most at risk of injury to the orbicularis motor branches.

Dr. Bryan C. Mendelson
109 Mathoura Road
Toorak, Victoria 3142
Melbourne, Australia
bcm@bmendelson.com.au

ACKNOWLEDGMENTS

The authors thank Dr. Fritz Barton (Emeritus Professor), Dr. Rod Rohrich (Professor), and Dr. Steven Byrd (Associate Professor), The University of Texas Southwestern Medical Center at Dallas, for their encouragement, support, and assistance with this project.

REFERENCES

37. Castanares, S. A comparison of blepharoplasty tech-


