

The Retaining Ligaments of the Cheek

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The zygomatic ligaments (McGregor's patch) anchor the skin of the cheek to the inferior border of the zygoma just posterior to the origin of the zygomaticus minor muscle. The mandibular ligaments tether the overlying skin to the anterior mandible. Both these ligaments are obstacles to surgical maneuvers intended to advance the overlying skin. They also restrain the facial skin against gravitational changes, and they delineate the anterior border of the "jowl" area. The platysma-auricular ligament is a thin fascial sheet that extends from the posterosuperior border of the platysma and that is intimately attached to the periauricular skin; it serves as a surgical guide to the posterosuperior border of the platysma. The anterior platysma-cutaneous ligaments are variable fascial condensations that anchor the SMAS and platysma to the dermis. They can cause anatomic disorientation with dissection of false planes into the dermis.

These four ligaments are useful as anatomic landmarks during facial dissections. The tethering effects of the zygomatic and mandibular ligaments must be interrupted if a maximum upward movement of the facial skin is desired.

In dissections of the cheek, one encounters two ligaments that anchor skin to bone. In addition, one often encounters aponeurotic condensations of connective tissue that attach platysma to dermis. The first two ligaments are reminiscent of the retaining ligaments of the finger.¹⁻³ The purpose attributed to the retaining ligaments of the finger is stabilization of the skin to afford better tactile and prehensile function. In nonprehensile mammals, the face dominates as the prime area for tactile and exploratory functions.⁴ Perhaps the retaining ligaments of the face share a teleologic kinship with those of the fingers.

Our observations of the zygomatic ligament (McGregor's patch)* have been made in approx-

* This anatomic structure was christened "McGregor's patch" by Mrs. Rosebud Preddy, a medical artist at Letterman General Hospital, when she prepared drawings for a slide presentation by Dr. Mar McGregor in 1959.⁵ The name has persisted, but it is sometimes applied in error to other structures.

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imately 50 facial halves in the operating room and 30 facial halves in the dissecting room. The mandibular ligament was appreciated more recently, and we have made about a third as many observations of this structure. We have observed the platysma-auricular ligament in surgical dissections of approximately 30 facial halves.

ZYGOMATIC LIGAMENTS (MCGREGOR'S PATCH) (Figs. 1 to 3)

Zygomatic ligaments are stout fibers that originate at or near the inferior border of the anterior zygomatic arch, behind the insertion of the zygomaticus minor muscle, and insert in the skin serving as an anchoring point. A typical grouping is a bundle of white, firm fibers 3 mm in width and 0.5 mm in thickness located 4.5 cm in front of the tragus. Anterior to this first bundle may be a second bundle, similar in width and half as thick; interspersed around these two bundles will be several smaller bundles. Typically, an artery and a sensory nerve course to the skin in the company of the thicker ligament. One of the upper rami of the zygomatic branches of the facial nerve usually lies directly beneath (deep and inferior to) the ligament and must not be confused with the sensory nerve. Traction on the cutaneous end of the cut ligament dimples the skin. The ligaments are about 6 to 8 mm in length, traveling directly from the zygomatic bone to the dermis. They fan out as they pass toward the skin. In about a tenth of our patients, this structure was not identifiable.

Others have observed these structures. In reference to superficial musculoaponeurotic system (SMAS) dissection, Owsley said: "In the region of the anterior border of the masseter there is a vertical septum that extends between the investing masseteric fascia and the overlying SMAS. This septum varies in density and strength. It is

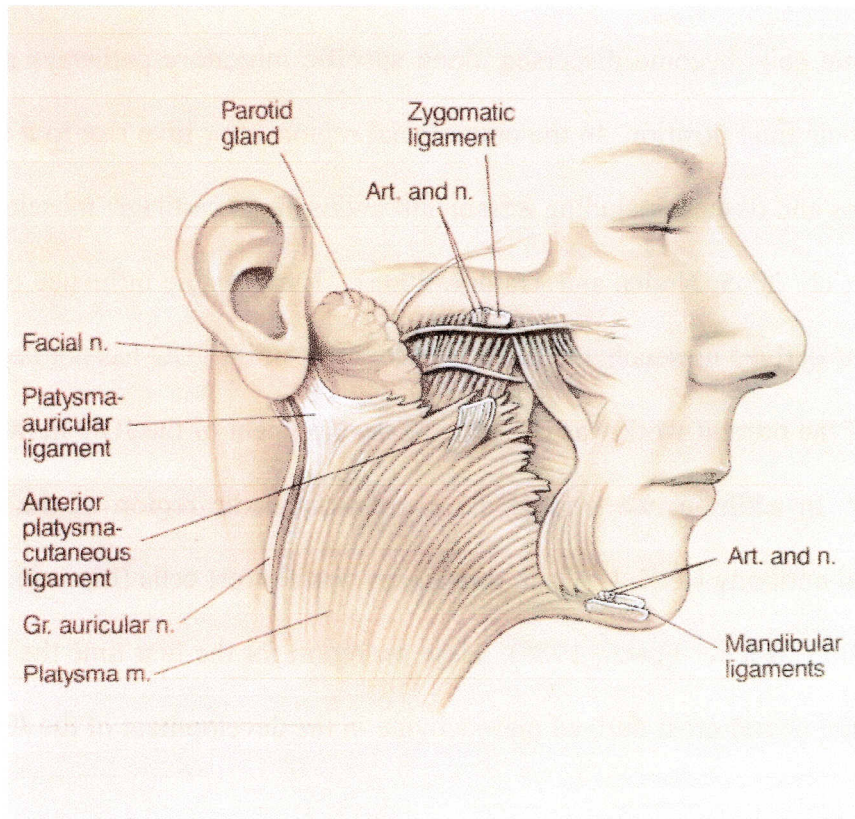


FIG. 1. Scheme of retaining ligaments of the cheek. Zygomatic ligament (McGregor's patch) and mandibular ligaments tether the skin to the facial skeleton. The platysma-auricular ligament and the anterior cutaneous ligaments are condensations of platysma fascia that extend to the dermis.

strongest superiorly in the region of the junction between the zygomatic arch and the body of the zygoma."⁸ Kaye made reference to "the adherent area over the malar eminence (McGregor's patch) [which] usually requires sharp dissection."⁴ Bosse and Papillon mention that the SMAS is "quite solidly bound to the malar bone by vertical fibrous septi and also arteries coming from the underlying facial artery that comes under the malar eminence. . . . With these fibers we have found some minute sensory nerves going directly through SMAS to the skin."⁹ Greenberg noted the presence of a small buccal branch of the facial nerve and a branch of the transverse facial artery in the mid-portion of this patch.¹⁰

McGregor stated of the "patch" bearing his name: "It is the area of fibrous attachment between the anterior edge of the parotid fascia and the dermis of the skin of the cheek."⁵ He cited its importance in facial surgery as follows:

"1. In doing a face lift procedure, if it is not necessary to extend your undermining be-

yond this 'patch,' you are safer to stop before cutting through.

2. If, in order to obtain good skin drapage, it is necessary to cut through the fibrous attachment, you must be aware that you will cut a blood vessel which should be cauterized on the skin side and on the parotid fascia side. Otherwise, you may have a post-operative hematoma. This may be a local small egg-sized lump or an elevation of the entire flap.
3. As soon as you cut through this 'patch,' you lose the protection of the parotid fascia on your deep side and you will see loose fat with branches of the facial nerve looking at you, hopefully intact.
4. Running through the loose fat, a little deeper and a little caudad, is the parotid duct. I have seen several cases in which this has been cut. . . . As stated above, I have for years emphasized that this 'patch' is a warning sign asking the surgeon to be aware of the road ahead."⁵

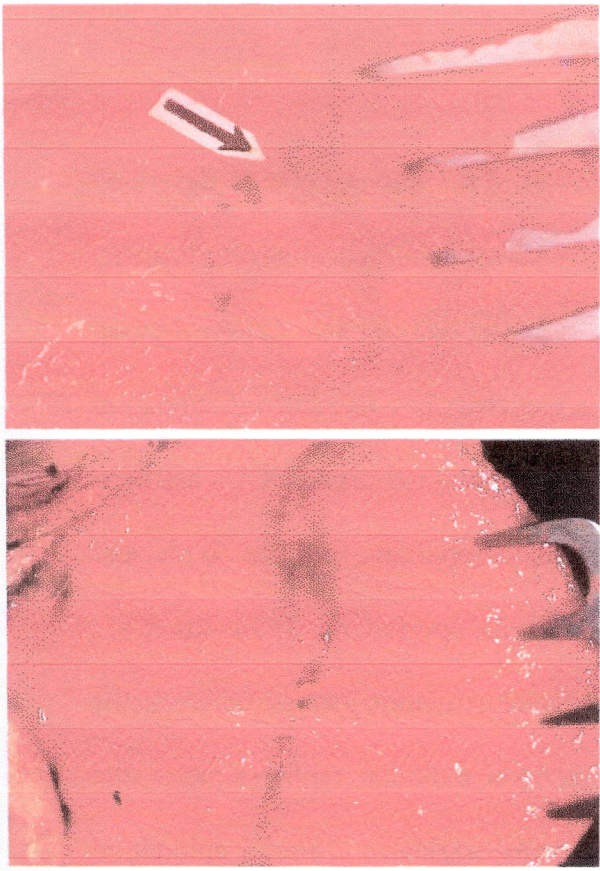


FIG. 2. Zygomatic ligament (McGregor's patch). (Above) Operating room view of right zygomatic ligament. The fibrous bundles originate on the lower anterior part of the zygomatic arch and fan out directly to the skin. (Below) Operating room view of right zygomatic ligament in a different patient.

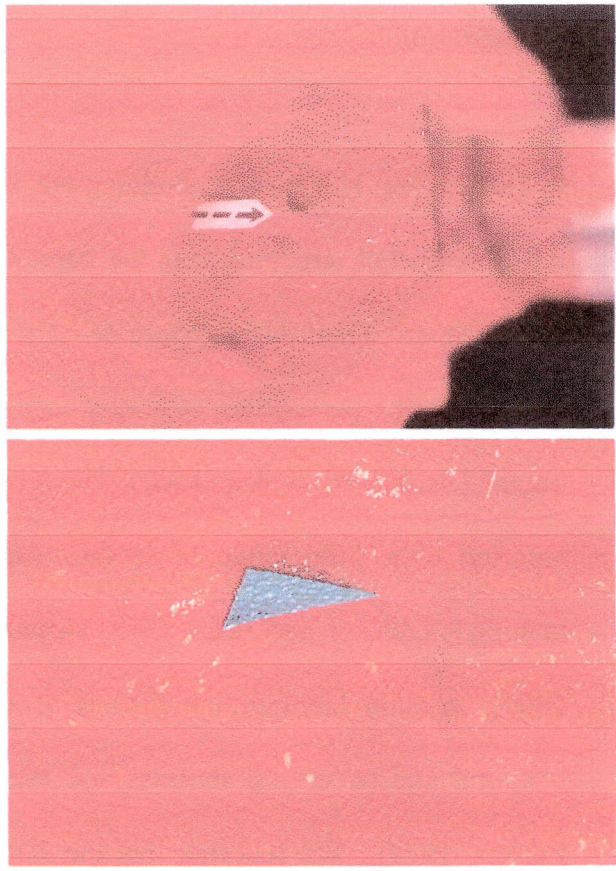


FIG. 4. Mandibular ligament. (Above) Operating room view of posterior edge and superior surface of upper part of the mandibular ligament. The ligament emerges from its osseous anchorage between fibers of platysma and triangularis to a solid attachment in the dermis. (Below) Close-up view of the right mandibular ligament in a different patient.

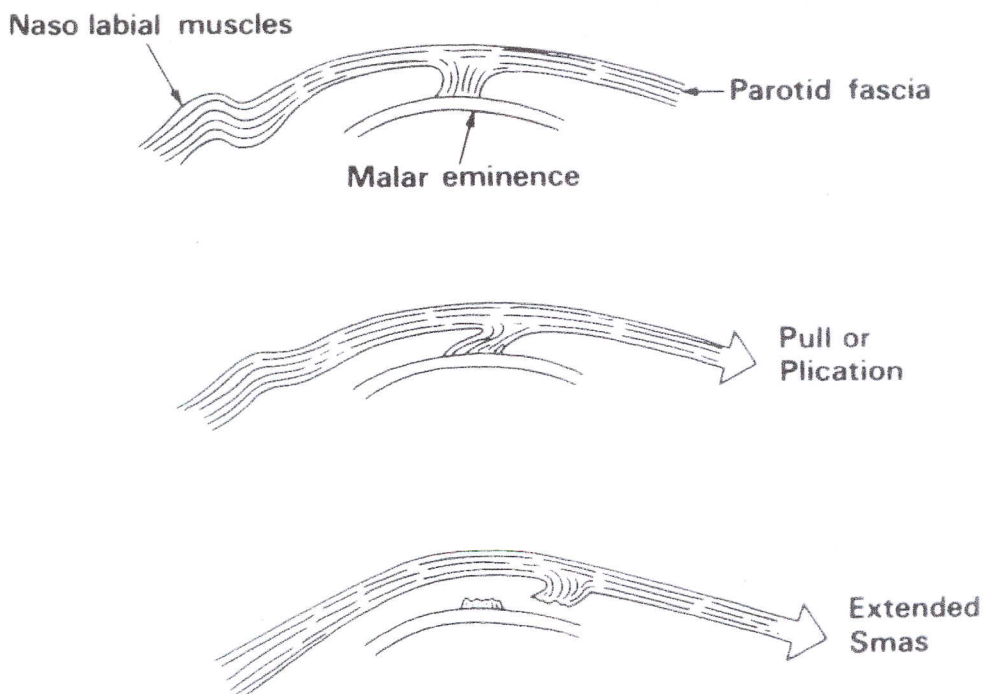


FIG. 3. Diagram of the tethering effect of the zygomatic ligament and the surgical release of this restraint. (From J. P. Bosse and J. Papillon, *Surgical Anatomy of the SMAS at the Malar Region*. In *Transactions of the 9th International Congress of Plastic and Reconstructive Surgery*. New York: McGraw-Hill, 1987. Reproduced with permission.)

Where the cheek skin sags severely, the most effective lift will be brought about if these ligaments are divided.

McGregor's admonitions have merit. However, the ligaments can be safely divided if the surgeon gains intimate familiarity with the anatomy, dissects systematically, and makes use of medium-power loupes and a headlamp for visualization. Dissection is performed by spreading movements only until the fibers of the ligament are isolated with certainty. Then they may be divided with a scissors cut.

MANDIBULAR LIGAMENTS (Figs. 1, 4 and 5)

The mandibular ligaments originate from bone along a line that is about a centimeter above the mandibular border and which extends along the anterior third of the mandibular body. These ligaments usually appear as a linear series of parallel fibers. Typically, a second tier of fibers is aligned 2 to 3 mm above and parallel to the first tier. These fibrous bundles interdigitate among the muscle fibers of the platysma and triangularis along their line of attachment. The ligaments take a direct perpendicular path to the skin and are about 4 to 5 mm long. A sensory nerve and a cutaneous artery usually accompany these ligaments.

The posterior limit of the mandibular ligament is usually palpable as a firm, sharp border, the position of which coincides with the anterior margin of the "jowl" area. These ligaments ap-

pear to restrain the anterior skin, preventing gravitational sagging, while the mobile skin just posteriorly tends to sag and form "jowls." If this ligament is released step by step and dissection is continued forward along the mandible, the sharply demarcated ligament gives way to diffuse but firm fibrous attachments between skin, muscle, and periosteum of the anterior mandible and chin.

The surgical importance of the anterior mandibular ligaments is that they tether the skin so that a "lifting" force applied to the cheek flap is not well transmitted to the submandibular area or to the jowl area. The surgical release of this ligament provides for a more effective submental lift, and it also clears a path from the cheek to the mandibular margin that provides access to the submental area for direct lipectomy (without the need for a submental incision).

PLATYSMA-AURICULAR LIGAMENT (Figs. 1 and 6)

The posterior border of the platysma recedes into an intricate fascial condensation that often attaches intimately to the overlying skin. This structure provides firm anchorage between the platysma and the dermis of the inferior auricular region. This layer lies immediately over the parotid. Some cutaneous branches of the great auricular nerve are often seen on the surface of the ligament or interwoven with the fibers. Branches of the great auricular nerve penetrate



FIG. 5. Jowls and the tethering effect of the mandibular ligament. (Left) Patient upright (J, jowl; ML, mandibular ligament; ZL, zygomatic ligament). (Center) Tension on the skin of the chin and the mandibular border shows the tethering effect of the mandibular ligament which prevents local gravitation and delineates the anterior border of the jowl. (Right) Another patient in the supine position. The arrow and ML indicate the mandibular ligament. The circle shows the jowl that is now effaced with a change in direction of the gravitational pull.

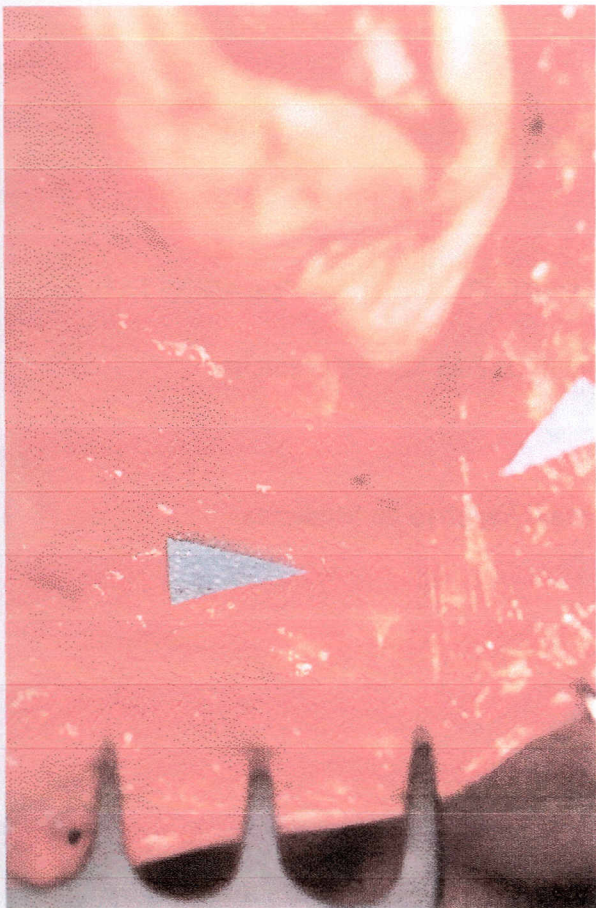


FIG. 6. Right platysma-auricular ligament. The left arrow points to a branch of the great auricular nerve. The right arrow points to the platysma-auricular ligament itself, a fascial condensation joining the posterosuperior edge of the platysma to the connective tissues and dermis in the area of the external ear.

inward through the ligament to supply sensation to the underlying parotid fascia.

This aponeurosis is important in anatomic orientation. It provides a dissection plane that leads directly to the external surface of the border of the platysma, avoiding exposure of the branches of the facial nerve. However, the surgeon must be wary of the fact that sometimes extensions of the platysma-auricular ligament insert directly into the dermis. If such an extension is followed heedlessly, it can lead to thinning and perforation of the skin.

The presence of the fibers of the platysma-auricular ligament provide a warning that branches of the great auricular nerve are nearby.

ANTERIOR PLATYSMA-CUTANEOUS LIGAMENTS (Figs. 1 and 7)

Aponeurotic connections are sometimes seen between the anterior platysma and the skin of



FIG. 7. Left anterior platysma-cutaneous ligament. The upper solid arrow points to condensation of the fascial extensions of the platysma which insert firmly into the dermis. The lower dashed arrow shows areolar, nonligamentous attachments between the fascial extensions of the platysma and the subcutaneous tissue.

the middle and anterior cheek. These are bands of condensed connective tissue that pass obliquely forward from the platysma to the dermis. They are of surgical importance because they can be a source of disorientation. The surgeon may assume that his or her dissection plane on the platysma will lead to an anterior free border and to other SMAS components when, in fact, the fascial band will divert the plane into the dermis, leading to thinning and possible perforation of the skin. Forewarned, the surgeon can transect the anterior platysma-cutaneous ligament before the dissection plane is deflected.

At times this ligament may be associated with a heavy, fibrous fascial investment of the platysma and stout extensions to the skin of the cheek. Such a musculoaponeurotic layer gives an exceptionally secure lift. However, the cutaneous insertions may cause striking dimpling of the skin

which necessitates localized separation of SMAS and dermis.

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