



Total Neck Rejuvenation, Harnessing the Platysma in the Lower Neck and Décolletage

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Abstract

Background Efforts to rejuvenate the lower neck and décolletage have not been adequately addressed by neck lift techniques which predominantly focus on improving the cervicomental angle and correcting fullness in the submental and submandibular region. Disappointment with a lack of initial result in the lower neck and early relapse of laxity led the author (DJH) to adopt the Fogli/Labbé vertical neck lift with a fixation of the platysma muscles to Loré's fascia Fogli (Aesthet Plast Surg 32:531–541, 2008), Labbé et al. (Plast Reconstr Surg 117:2001–2007, 2006). Over the past 8 years, since the original “modified” Fogli description was published by Hodgkinson (Aesthet Plast Surg 36:28–40, 2012), the technique has evolved with a specific aim to improve the initial results of the neck lift in the lower half of the neck and have the result maintained in follow-up.

Methods The clinical photographs of female patients who underwent face and neck rejuvenation utilising a modified Fogli vertical platysma advancement technique were evaluated as to the improvement of the rejuvenation in the lower neck and décolletage and compared with the photographs obtained by the original pexy technique. The review was restricted to patients operated on in the prior

extant three-year period and compared with the results of patients having surgery in that preceding five years prior to the review period.

Results The results of the recent technical modifications of the vertical lift by the platysma flap advancement were superior to the previous pexy technique and attributable to the advent of the surgical auricular-platysmal flap advancement. This flap, which in continuity with the distal platysma was affixed with permanent sutures to Loré's fascia after definitive release of the cervical retaining ligaments of the platysma.

Conclusion The modifications of the vertical platysma fixation to Loré's fascia after mobilisation of the distal platysma by detachment of the cervical retaining ligaments utilising an advancement of the platysma led to improvement in the rejuvenation of the lower neck and décolletage when compared to the pexy technique of the original Fogli/Labbé description.

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Keywords Vertical fogli lift · Auriculo-platysmal flap · Décolletage · Lower neck

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Introduction

The aim of the review was to evaluate the improvement in the clinical photographic appearance of the lower neck and décolletage as a consequence of progressive changes made

in the vertical Fogli/Labbé plication of the platysma over the last three years from previously published techniques [1]. The lower neck includes the throat, muscular insertions of the sternomastoid into the clavicles, the suprasternal notch and the clavicular heads. This area is a “sensual zone” to which our eye is attracted as it is a boundary area between the upper chest and throat [2] (Fig. 1). It is a *frisson* zone of sexual glance [3, 4]. The laxity and wrinkling that accompanies ageing in this area is a concern to women, who express their dissatisfaction of these aged changes as a loss of confidence in their youth and beauty accompanied by a sense of loss of desirability and allure.

A review of published before and after face and neck lifts in the American Society of Plastic Surgeons (ASPS) gallery failed to document the status of the lower part of the neck and décolletage in over 50% of published before and after results.

The ageing in the lower neck is made evident by a lack of definition of the sternomastoid border and its insertions into the clavicle. It is also associated with horizontal wrinkles in the suprasternal notch and lower neck and the presence of platysmal laxity and banding all of which result in the neck being visually shorter. Restoration of tone in this area as well as lessening of wrinkles re-establishes the



Fig. 1 The sensual lower neck and décolletage in a 25-year-old female

lower neck as visually longer and younger and more sensual, restoring confidence and desirability previously lost.

Materials and Methods

The surgical design and photographic documentation of 160 female patients undergoing face and neck rejuvenation in the past 3 years were reviewed (Group 1). These were compared with the same approximate number of patients from the prior five years (Group 2). All patients were operated on by a single surgeon. The objective was to assess changes in the appearance of the platysma bands, definition of the sternomastoid muscle border and transverse wrinkles in the lower neck and décolletage by visual analysis of the photographs of Group 1 and Group 2 patients. All photographs were taken in a dedicated photographic room with a Nikon D7000 SLR camera and Micro-Nikkor 105mm 1:2.8 lens.

Patients were interviewed pre-operatively in the last 3 years relative to the significance of this laxity and what it meant to them in terms of their feelings about self, confidence and sexual appeal. Photographs of the neck were taken to document the appearance of the neck and décolletage, better viewed in anterior and oblique direction. Post-operatively, at least 6 months, further photographs were taken and evaluated to document changes in the laxity, tone, horizontal wrinkling, presence of platysmal bands and definition of the anterior border of the sternomastoid muscle. The same patients were again interviewed at this same time six months or more post-operatively as to the significance of the changes in their confidence and sexuality as well as other people’s perceptions of the changes subsequent to the surgical neck lift.

Results

The aim of the review of the photographic records of the patients in Group 1 and 2 was to assess the visual appearance of the lower neck and the junction between the neck and chest referred to as the décolletage. The limitations of photographic evaluation was that the junction of the neck and chest was not always displayed in the Group 2 patients. Group 1 patients compared to Group 2 had noticeable less platysmal banding, a better-defined lower border of the sternomastoid and a lessening of lower neck horizontal wrinkling. There was an 80% improvement in

Group 1 compared to a 50% improvement in Group 2.—Laxity of skin in the lower neck was more difficult to assess photographically. Tone of the skin was assessed in Group 1 by pinch and stretch of the lower neck skin, before and after the procedure and was noted to be improved. Group 1 patients were interviewed as to their perception of the results in the lower neck and décolletage. Many Group 1 patients dressed differently after the surgery displaying their chest and cleavage to advantage. Patients reported the neck as taller and this was observed also by the patient's social contacts.

Pre-operative Evaluation

Pre-operatively, all patients undergo a Likert scale psychological assessment to evaluate their psychosocial profile and if deemed not mentally ready for surgery or unsuitable for surgery, are referred to a mental health care professional and surgery is postponed. All patients are assessed by an anaesthetist and only ASA1 patients undergo the procedure in an outpatient surgical facility. All patients are evaluated as to the degree of laxity of the skin and the position in repose on contraction of the platysma muscle. Evaluation of the platysma as to how it will vertically impact on the lower neck and décolletage is assessed pre-operatively specifically the laxity is assessed by pinch and stretch of the lower skin and décolletage. A surgical design defines the position of the lowest, deepest transverse neck wrinkle and the direction of the auriculoplatysmal flap descending from the tragus to this area is marked, as is the ramus of the mandible and the platysma bands and sternomastoid border.

Surgical Technique

The modified Fogli necklift is not a limited incisional procedure, but one with traditional incisions including pre and post auricular and a submental excision which is usually performed, as well as dissection inferior to expose the access to the lower half of the neck and platysma. Tranexamic acid (10 mg/kg) intravenously as well as an infusion of local anaesthetic, Xylocaine and Adrenalin 1:1,000,000 is utilised to reduce intraoperative bleeding.

All procedures were carried out under general anaesthesia as an outpatient. Hypotensive anaesthesia was not utilised during dissection and hemostasis secured by point bipolar cauterisation. The dissection proceeds in the subcutaneous plane from the postauricular and mastoid area being mindful not to damage the dermis to expose the platysma muscle in the neck just below the deepest transverse horizontal neck wrinkle usually 5–7 cm below the angle of the mandible. This skin dissection is continuous

with skin dissection of 3–4 cm anterior to a preauricular incision.

Six modifications have evolved over the past 12 years since adopting the technique of vertical platysma plication to Loré's fascia. I give full credit to Alain Fogli [5] for introducing me to the concept, Daniel Labbé's [6] contemporaneous article also confirmed the advantages of vertical platysma plication. The major paradigm shift in the technique is to convert elevation of the platysma from a suture pexy to a platysma skin advancement flap. Other refinements which have developed since the original pexy are as follows:

1. *Point of Fixation* The point of fixation of the suture plication in the platysma should be just beyond the deepest transverse wrinkle in the neck. This will require greater dissection of the skin from the platysma and the border of the sternomastoid than was originally described and will usually be 5–7 cm below the mandible (Fig. 2).
2. *The Development of the Auriculo-platysmal Flap* An auriculo-platysmal flap designed in the auriculo-platysmal ligament originally described by Furnas, extends from the anterior border of the tragus, being 1 cm wide and descends behind the angle of the mandible down the anterior border of the sternomastoid, detaching the flap and hence the platysma from the sternomastoid muscle by severing the cervical

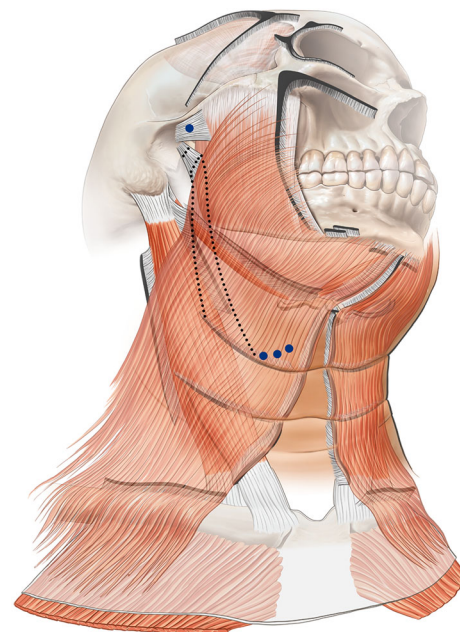


Fig. 2 The auriculo-platysmal ligament flap is incised from the pre-tragal region and detaches the platysma from the medial cervical ligaments confluent with the anterior sternomastoid border

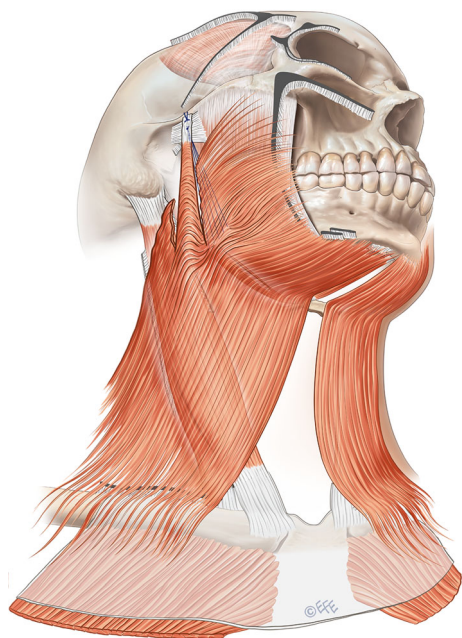


Fig. 3 Suture attachment of the auriculo-platysmal ligament flap tensions the lower third of the neck and has a horizontal vector defining the cervicomental angle and mandibular border. Excess tissue is transmitted to the gonial angle

retaining ligaments (Vid. 1). The auriculo-platysmal flap has in the last 3 years extended more anteriorly, is wider and longer than previously described [7]. The base is still 1 cm wide but 2–3 cm wide in its distal intra-platysmal extent. The platysma is effectively partitioned for approximately 5 cm below the angle of the mandible. The flap arcs forward to approximately 3 cm in width at the point of distal detachment (Fig. 3). This flap may range to approximately 8–10 cm in length and is composed of auriculo-platysmal ligament fascia and fascia of the retaining cervical ligament and the platysma muscle itself with its associated anterior and posterior superficial fascial covering. It is a handle to elevate the distal platysma and effectively tighten the lower third of the neck and décolletage. This is fundamental to the improvement of the lower third of the neck and décolletage. Once the flap is elevated, the subplatysmal structures are available for observation and the mobilisation of the platysma (Vid. 2). A Trepsat elevator can then detach the distal platysma and expose the external jugular vein which is deep, and branches of the cervical plexus are seen transversing the space developed by the dissector. The dissector can be passed forward to the anterior neck, the facial nerve branches are deeper and more anterior to the developed flap. The external jugular vein is noted deeper and protected. Traction on

the auriculo-platysmal ligament flap demonstrates vertical and horizontal neck tensioning (Vid. 3, 4).

3. *Suture Fixation* The suture fixation is between the platysma, in front of the incised auriculo-platysmal ligament flap and consists of three loops of a 2-0 or 3-0 braided Tevdek** suture on a half-circle needle (Vid. 5, Fig. 4). Fogli used a single suture for plication of the platysma to Loré's fascia. Each suture bite is between 0.5 and 1 cm apart from each other, ranging from just in front of the auriculo-platysmal ligament flap incision and progressing forward. This forms a triple cable suture attachment to the cut edge of the preauricular incised parotid fascia and descends deeply to engage Loré's fascia in the pretragal region. Traction placed on these sutures elevates the distal platysma muscle up to 5 cm. The point of cessation of elevation is tightening of the lower third of the neck and décolletage observed on the operating table as well as horizontal traction noted in the submandibular and submental area.
4. *Coverage of the Triple Cable Suture and Knot* The auriculo-platysmal ligament flap is then replaced over the looped suture and knot in the pretragal region (Vid. 6). The permanent must lie behind the angle of the mandible when secured. Vertically shaped mandibles with a prominent posterior angle may not be suitable for this technique as the sutures should not lie over the mandible itself, but tuck behind the mandible and in so doing they accentuate the mandibular sternomastoid groove. Additional sutures can be applied to the cut edge of platysma in the posterolateral fashion to the mastoid fascia and aid in horizontal tensioning. The parotid gland is often exposed in the elevation of the auriculo-platysmal ligament flap, but the re-application of the flap over the cut excision seals the gland. Additional absorbable 4-0 Vicryl*** sutures then secure the auriculo-platysmal flap to the pretragal region and the anterior incision of the parotid fascia, thus sealing the exposed parotid gland and giving added security to the repositioned auriculo-platysmal flap.
5. *The Gonial Angle of the Mandible* Subsequent to the elevation of the soft tissues by the auriculo-platysmal flap, the gonial angle is re-established and may be excessive due to the amount of tissue that has been elevated into the lower face. The tissues can be contoured and excised and the excision of this excess tissue will give access to the premasseteric space and be the commencement of an incision in the SMAS platysmal layer from the angle of the mandible to the malar region. Deep plane facelifting can proceed as indicated by the operating surgeon.

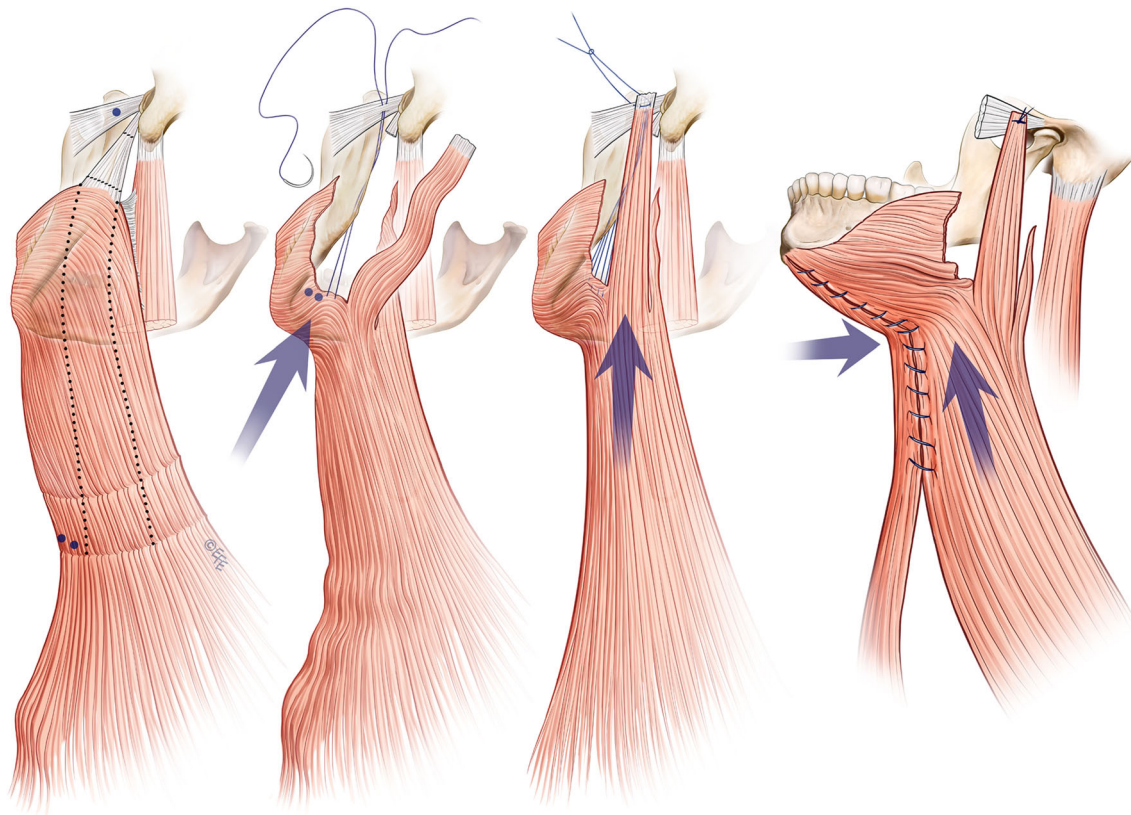


Fig. 4 The auriculo platysmal ligament flap extending distally into the platysma affords a vertical vector elevation and is fixed to Lore's fascia. Platysmaplasty further tensions the anterior platysma in a superior vector

6. *The Submental Incision* The submental incision is utilised if the need for platysmaplasty is documented pre-operatively or apparent intraoperatively. Fogli originally avoided a submental incision as the author did in most of the Group 2 patients. The incision is necessary for deep neck surgery and the addition of an anterior platysmaplasty which contributes to vertical elevation of the platysma. The author initially excised the platysmal bands when encountered after the auriculo-platysmal flap had been secured, however these cut edges became more lateral and were noted on follow-up. By adapting suturing or resecting and suturing the platysma bands, a horizontal tightening and a more defined cervicomental angle can be achieved. Permanent braided suture is used in the submental fixation of the platysma to the perihyoid fascia. Below the hyoid bone, absorbable braided sutures are used in a continuous suture to approximate free edges of the platysma. The extent of suturing plication can be to the suprasternal notch in a very lax neck.

A derivation of the auriculo-platysmal flap extending from below the earlobe can be used in isolated neck lifts without laxity in the lower third of the neck and where the preauricular skin incision has been deleted. This flap extends part-way down the sternomastoid, consisting of

some auriculo-platysmal ligament fascia, severing some of the cervical retaining ligaments. The flap is then transposed and secured to the mastoid region to give traction to the submandibular region thus re-establishing the cervicomental angle and giving definition to the ramus of the mandible (Fig. 5). This modified technique is used if the lower neck and décolletage are not lax and ageing change is limited to the submental and submandibular region.

Complications

There have been no haematomas since the introduction of the surgical net as adopted from Auersvald [8] in the last 18 months. Three sialomas have occurred, one secondary to removal of the superficial lobe of the of the submandibular gland and another from platysma auricular ligament exposure of the parotid gland. Weakness of the lower lip depressors, presumably from traction damage to the cervical branch of the facial nerve is observed in approximately five per cent of cases and resolves spontaneously in 3 months. There has been only one infection in the submental region and no wound dehiscence or wound necrosis in the last 160 cases (Group 1). Minor wound problems including hypertrophic scarring have been dealt

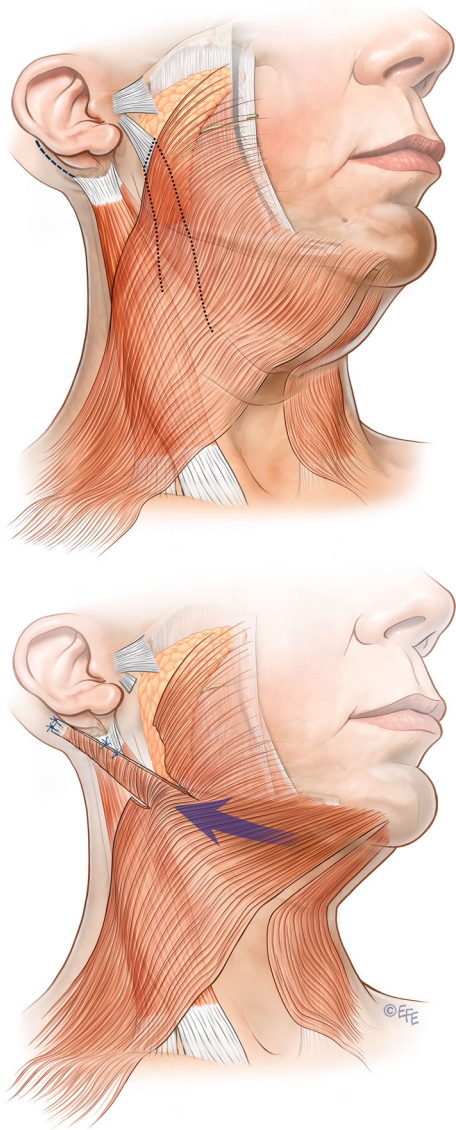


Fig. 5 Modified platysma auricular ligament flap attached to the mastoid process in isolated neck lift

with by the use of intralesional steroids and scar revision which was rarely required can be performed under local anaesthesia.

The advantage of utilizing permanent sutures is in secondary operations for recurrent laxity. The permanent knot from the triple cable suture can be captured and retightened back to Loré's fascia in the preauricular area (Vid. 7). This has previously been reported by the author [9].

Illustrative Cases of Lower Neck Rejuvenation

1. 55-year-old female: 6 months before and after facelift, neck lift and blepharoplasty with submental incision.



2. 43-year-old female: 6 months before and after isolated neck lift without submental incision.



3. 45-year-old female: 6 months before and after facelift and neck lift with submental incision and removal of granulomatous foreign bodies from right cheek and nasolabial region.



4. 40-year-old female: 6 months before and after isolated neck lift with upper blepharoplasty through limited postauricular and submental incision.



Discussion

The preference for a long neck is perhaps the only corporal aesthetic area that is shared universally [10]. The ageing female neck is a concern to many women who frequently seek pharmacocosmetic and non-surgical treatments in an attempt to restore the tone in the neck and the quality of the neck skin. They may progress to a surgical rejuvenation as the results of the non-surgical and pharmacocosmetic applications do not achieve ample improvement of the tone or laxity in their neck. Typically, if they have excess fat in their neck they complain of a double chin or if they are more slender or scrawny of skin laxity and wrinkling in the lower third of the neck and décolletage. Patients describe themselves disparagingly if prominent platysmal bands are present as having a “chicken” or “turkey” neck. At consultation, an exploration of the impact of these changes on the patient’s psyche reveals a reduced self-beauty assessment accompanied by a lack of confidence, decrease in sexuality and desirability.

We do not observe a resting platysma in younger patients, and there is no platysmal laxity in the submental area and the lower neck and décolletage are taut. In the young, on contraction the activity of the platysma is noted, but the platysma is bound to deep fascia and assumes its resting position and contour of the neck after the contraction. A 23-year-old female shows activity of her contracting platysma (Vid. 8). The submental area is taut and the lower neck and décolletage firm.

An unusual case of platysmal banding and laxity is seen in an 18-year-old girl who presented complaining of a vertical neck band (Vid. 9). There is laxity in this young patient and a band on contraction, and this was likely a vestigial remnant of what was defined by Lightoller [11] as the trachelo-platysma. In this patient, the band was resected surgically and eight years later there was no recurrence of the band (Vid. 10).

Human expression is made possible via the evolution of the facial muscles of expression; the most primitive and principal muscle being the platysma. The platysma has a horizontal facial component and a vertical neck component. This is understood by study of the phylogenesis of the platysma muscle. By studying primate facial musculature, Lightoller and Huber [12] were clear that there was progression of development of the platysma and the greatest changes occurred in the neck as the primate advanced from a quadrupedal to bipedal species. Lightoller described two basic components of the platysma: one emanating from the posterior cervical region, the noto-platysma, and the other from the anterior cervical region, the trachelo-platysma. These are two distinct components in lower mammalian

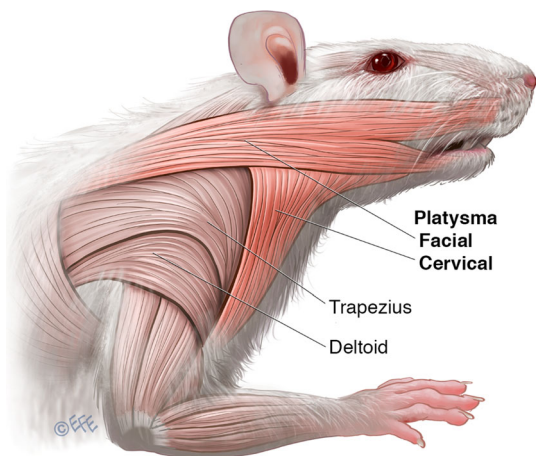


Fig. 6 Lower order mammalian platysma has two components which coalesce at the oromandibular region

species (Fig. 6). The platysma in humans is derived from these two anatomical remnants. These two remnants of platysma coalesce at the mandible where horizontal and vertical fibres meet, giving an internal material-like warp and weft pattern of coalescence of the two remnants of the platysma. Traction on this part of the platysma will transfer to adjacent parts due to the internal arrangement of the bidirectional fibres at the submandibular level. In the lower platysma which variably progresses into the pectoral region, however, there are only vertically oriented muscle fibres and therefore a vertical traction is mandated to advance the lower neck platysma.

Understanding the shape of the platysma, its attachments and points of fixation is critical to optimise how tensioning can change its position and shape. Three-point fixation is the basis of this tensioning as in the sail of a sailing boat. Without tension from at least three points, the sail or platysma necessarily is lax and dysfunctional across the majority of its surface (Fig. 4).

The skin, being attached to the platysma, follows the movement of the platysma as it ages. The clinical presentation with progressive ageing is submental laxity of skin and anterior platysma bands with an eventual descent to the lower neck and décolletage depending on the extent of these highly variable muscles. The muscles themselves are noted on forced contraction but in fatty necks they are camouflaged and less obvious. Loss of subcutaneous fat exposes the visual profile of the platysma muscles.

The fascial attachments of the platysma muscle need to be addressed in order that the platysma be expected to move in a predictable manner (Fig. 7). The SMAS needs to be released from its ligamentous attachments to move the skin of the face as does the platysma require ligamentous release to move it horizontally and vertically. The SMAS and platysma are conveniently defined as a single

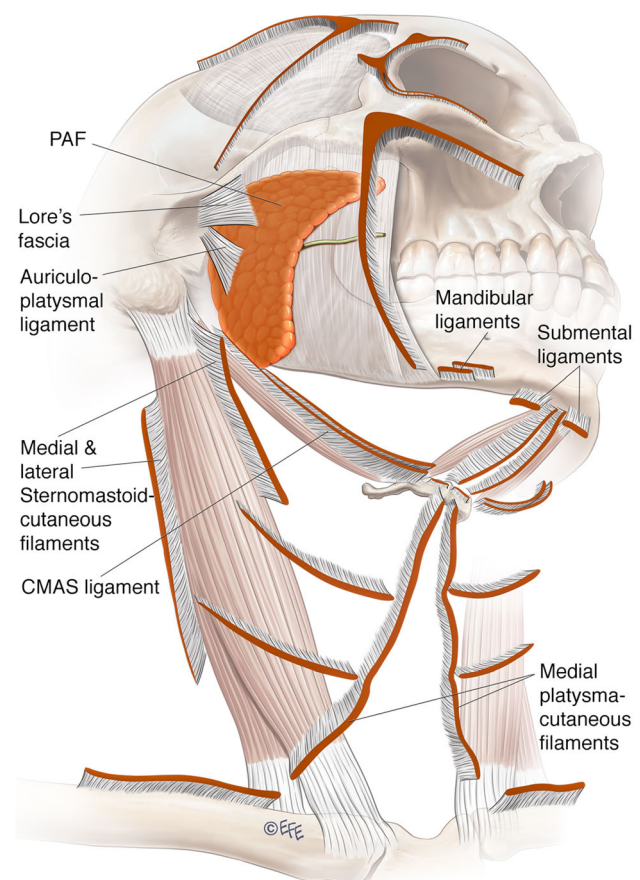


Fig. 7 The ligamentous attachments of the face and platysma

interconnecting structural sub-unit in level 3 of Mendelson's [13] concept of five layers of the face extending from the scalp to the chest. Where muscle is not present, superficial fascia intervenes as a fibrous network varying in thickness and attached at different locations to underlying structures: muscle, bone and deep fascia. These attachments to deeper structures are gateways for nerves and vessels to transit from one layer to the next. What is important in neck rejuvenation is to appreciate the continuity of the SMAS in the face with the platysma in the neck and to understand that subplatysmal ligaments or attachments need to be released in order to restore or move the platysma in a more advantageous rejuvenating vector, translocating skin which is intrinsically attached to the platysma muscle. The platysma muscle has a bony attachment to the anterior ramus of the mandible and an additional attachment called the platysma-mandibular ligament, defined as 45.6 mm anterior to the gonial angle by Zins [14].

The auriculo-platysmal ligament originally described by Furnas [15] anchors the platysma to the parotid fascia above and posterior to the mastoid fascia. It is thick and particularly strong in the pretragal region, which is confluent with the fascia over the parotid gland, here referred

to as Loré's fascia [16], which forms a point of attachment of the vertical platysma anchoring because of its strength and its attachment to the base of the skull. The platysma crossing the sternomastoid obliquely has attachments to the muscle by median and lateral sternomastoid platysma ligaments, as attachments between the superficial fascia on the posterior aspect of the platysma and the deep fascia in the sternomastoid. Mustoe [17] can be credited with describing these as “cervical retaining ligaments” of the skin and platysma below the angle of the mandible. Mustoe released the platysma below the mandible in continuity with the facial SMAS. The dissection over the sternomastoid was aided by sharp dissection and liposuction until a pivot point was reached where the platysma could be mobilised. These cervical retaining ligaments are released by Jacono [18], who recently explored these attachments, quantifying their strength; the strength being lesser from superior to inferior along the border of the sternomastoid inferior to the angle of the mandible. Release of these ligaments is important to attain superior elevation and movement of the lower half of the platysma. It was at that point below the angle of the mandible where Jacono partitions the platysma from a SMAS-platysma flap. The partitioning below the mandible after release of the ligaments aids his movement of the cervical platysma to rejuvenate the neck skin.

Being a second brachial arch-derived hyoid structure, the platysma is attached to the hyoid via the cervicomenal angle suspension ligaments (CMAS), described recently by Labbé [19] (Fig. 8). Re-establishment of this ligament improves the cervicomenal angle. The hypoplatysmal ligament described by Brandt and Associates [20], attaches the hyoid to the undersurface of the platysma and the lesser cornu of the hyoid bone medial to the stylohyoid ligament and also is responsible for defining the cervicomenal angle. Le Louarn [21] utilises this ligament to re-establish attachments between the hyoid and platysma at the hyoid bone, re-establishing the cervicomenal angle and vertically tightening the submental skin laxity (Fig. 9).

Without reference to retaining ligaments of the platysma, the founders of modern neck rejuvenation utilised the platysma to improve the cervicomenal angle and redefine the jawline. These founders, Connell [22] and Guerrerosantos [23] incised the platysma muscle below the mandible and re-draped it transversely and attached it to the sternomastoid fascia and mastoid fascia prior to 1980. They heralded in a new era of neck rejuvenation replacing skin resection and fat contouring procedures which gave results in the neck which were transient and inevitably relapsed. Neck rejuvenation became an integral part of facelifting. Combined procedures of cervicomenal rejuvenation then began to include a platysma component. Owsley [24], Aston [25], Marten [26] and others improved

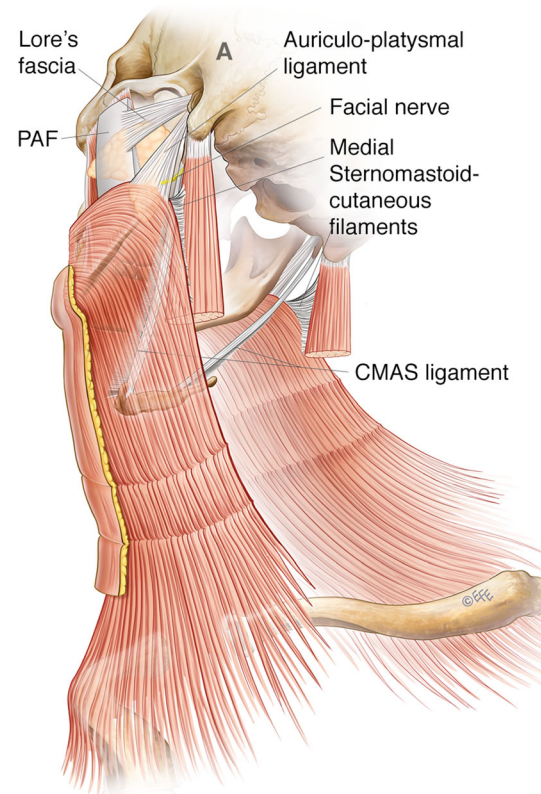


Fig. 8 Origin of the platysma muscle from the pectoral fascia to insert into the face, platysma auricular ligament, CMAS (cervicomenal angle suspension ligament) and sternomastoid fascia

the neck component by superolateral attachment of the platysma to the mastoid and sternomastoid fascia through suturing. Botti [27] emphasised the importance of vertical fixation of the SMAS platysma flap attaching it to Loré's fascia to achieve a more definitive improvement of the lower neck. The major difference in my technique is that sutures are not directed from the lateral dissected platysma flap but are more anterior at the distal partitioned platysma thus giving a more vertical elevation directed anteriorly than that described by Botti. The force is specifically channelled towards the suprasternal notch and décolletage. These authors also added a submental incision for plication of the platysma medially. Feldman [28] in his platysma-plasty produced a corset suturing of the platysma in the midline and contour tightening of the platysma muscles to give impressive results of rejuvenation in the submandibular region and in the mid and lower section of the neck. The lateral and medial approaches to platysma improved the cervicomenal angle, however the traction did not focus on the lower neck and suturing of the muscles with the lateral approach or transection was likely to fail due to excessive movement of the neck and the fact that the platysma in the lower third of the neck was left to its own devices.

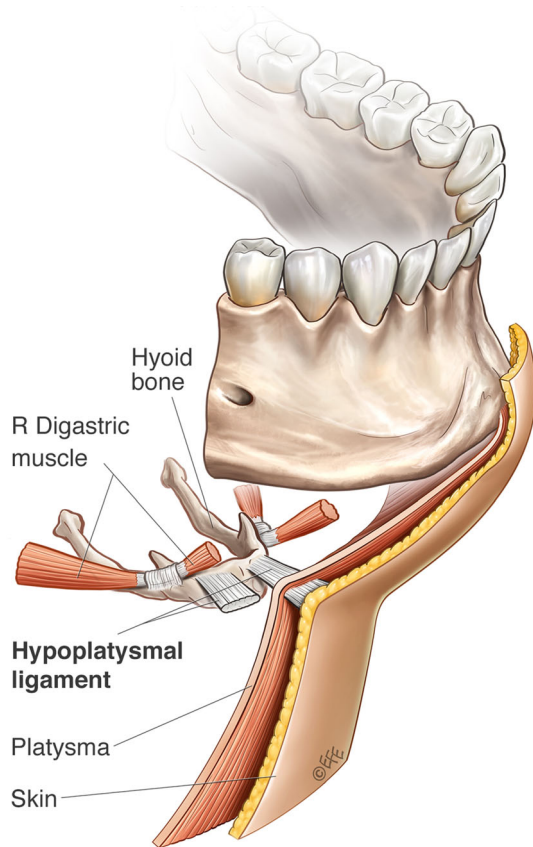


Fig. 9 The hypoplatysmal ligament

Fogli [5] rejected these approaches as did Labbé [6] in their publications. The advancement was made in attaching the platysma which had collapsed in the anterior neck, to Loré's fascia with vertical elevation sutures. A horizontal vector from the suturing also improved the cervicomentral angle. This is likely due to the warp and weft pattern of the internal structure of the platysma at this junction, which acts as a trampoline-like tightening in the submandibular region and can elevate a subluxed normal sized submandibular gland. Fogli continues his suture fixation technique through the SMAS and premaral fat, affixing them to the malar periosteum. Fogli did not use the submental incision except in rare cases.

When the author first adopted the new approach [1], he/she also deleted the submental incision, however the recurrence of anterior platysmal bands encouraged the author to readopt the submental incision which allowed definitive platysmaplasty as well as access into the deep structures of the neck. To improve the lower neck and décolletage, the author abandoned suture only pexy plication and developed the auriculoplatysmal flap as a handle to transmit force to the lower aspect of the neck and décolletage creating an advancement platysma cutaneous flap. This flap has been extended more anteriorly and

distally by detachment from the cervical retaining ligaments of the lateral platysma to the sternomastoid muscle and effectively partitions the platysma (Fig. 4). The approach to the submental region may be a “look-see” procedure when one is not sure of the anatomy or one feels that a neck could be improved with a definitive approach after evaluation of the patient pre-operatively. The submandibular glands and deep fat of the neck as well as the anterior extent of the platysma banding and the position and thickness of the digastric muscles and position of the hyoid bone can also be only effectively approached with a submental incision. Auersvald [29] has been a strong proponent of definitive deep neck surgery and has a subgroup of patients with heavy thick necks who benefit significantly by deep neck surgery involving resection of the submandibular gland, modification of the digastric muscles, suturing of the digastric muscles, and suturing of the deep fascia of the neck as well as the strap muscle approximation down to the suprasternal notch.

In the author's present technique, the anterior platysmal bands, if still present after the strong elevation and fixation of the lateral platysma to Loré's fascia can either be resected, plicated or sutured back to the perihyoid fascia depending on the anatomy as well as the progressive improvement obtained by each movement on the cervicomentral angle and the shape of the submental angle. Anterior platysmaplasty adds superior elevation to the platysma bands. The author has no compunction about removal heavy platysmal bands if present and transection of bands that are highly contractive. Combining deep neck surgery with this approach under the platysma, between the platysma and the digastric borders with digastric muscle modifications, it is important not to over-hollow the area and trimming should be judicious to avoid a “cobra neck” appearance. Two problems encountered in the submental region include vigorous midline venous bleeding as well as lymph nodes encountered and need to be dealt with usually by resection. A “second look” is worthwhile due to the potential of haematoma formation in this region.

Barry Jones [30] avoids opening the neck, because he believes that there is increased rate of haematoma in the submental region. However, as Rohrich [31] pointed out, avoidance of the submental incision leads to a higher rate of recurrence of platysmal bands. Auersvald [7] introduced the surgical net to control bleeding in the facelift and the submental area benefits significantly by this anti-haematoma net. This has the additional advantage of plicating the neck skin superiorly to the underlying tissues and is especially useful in the lax skin of the elderly where the skin contractability is unpredictable. As Guyuron [32] has stressed, platysma band surgery is more directly addressed by utilising the submental incision.

Platysma suturing techniques in the submental region have a limited effect on improving laxity in the lower third of the neck, however extending suturing below the hyoid transmits further tension vertically to the lower third of the neck and décolletage (Fig. 4). Skin traction will initially transmit to the lower third of the neck, however has the same fate of skin traction in the face with relapse without the addition of securing the platysma as a vehicle for carrying the skin into a new position. Matarasso [33] noted the limitations of neck procedures, in that the patients continue to age and there are aspects of ageing which contribute to neck laxity including skeletal changes of the cervical spine [34] and soft tissues; hence a recurrence of the appearance of ageing was more likely to occur as the years progressed. The constant movement of the neck will eventually weaken neck muscle support and lead to recurrence in some patients. There are some patients where hyperactivity of the muscle is such that only neuromodulation, as espoused by Trevidic [35], can reduce this hyperactivity. Trevidic has also noted that perhaps an alternative to the hyperactivity would be to sever the cervical branch of the facial nerve, however this is not clinically applicable at this time. Thorne [36] noted that denervation of the muscle is unlikely to occur in most operative procedures on the platysma. Those patients who have a thin, scrawny neck and hyperactive muscles are less likely to be good candidates for any type of platysma surgery, except perhaps the resective surgery as recently espoused by Pelle Ceravolo [37].

Conclusion

The lower neck and décolletage have been described as the last frontier of neck rejuvenation [38]. The modifications that the author has made to the original description of neck rejuvenation by Fogli's technique over the last 12 years have focused on the transmission of a vertical vector force to the lower neck and décolletage. This can only be achieved by extending a skin dissection inferiorly so that the lower platysma can be engaged with sutures and the permanent sutures form a traction and fixation to Loré's fascia behind the angle of the mandible. The auriculo-platysmal ligament flap developed must descend to a more central portion of the platysma and in so doing detaches the platysma from the sternomastoid and its cervical retaining ligaments. Traction then on the flap will elevate the unimpeded lower neck as a composite flap of skin and platysma. Adding the submental incision allows for deep neck surgery, especially significant with heavy necks and less so in those with scrawny necks, facilitating direct extended platysmaplasty when needed. Total rejuvenation of the ageing neck needs to include the lower third of the neck and décolletage as well as the submental and

submandibular region. To achieve this, the original concept of vertical platysma pexy by Fogli/Labbé has been modified to a composite vertical advancement platysma flap with permanent fixation to Loré's fascia.

Compliance with Ethical Standards

Conflict of interest The author declares that he has no conflicts of interest to disclose.

Human Rights and Animals This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent Informed consent has been obtained for all identifiable subjects.

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