



Fixation of Superolateral Platysma Flap to the Mastoid Fascia: A Novel Isolated Neck Lift Technique

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Abstract

Background This study aimed to evaluate the utility of a novel neck lift technique based on fixation of superolateral platysma flap to the mastoid fascia in terms of postoperative aesthetic outcome and patient satisfaction within an 18-month follow-up period.

Methods A total of 145 female patients who underwent isolated neck lift operation with the superolateral platysma flap technique were included. Global Aesthetic Improvement Scale (GAIS) scores (by the investigator) and the patient reported outcomes were recorded in terms of improvement in the cervicofacial angle, jowls, platysmal bands and malpositioned cervical fats, at 6 and 18 months, postoperatively. The complications were recorded at early postoperative period and at 1, 6 and 18 months, postoperatively.

Results The median duration of follow-up was 18 months (range, 6–48 months). GAIS scores at 18th months, revealed exceptional improvement in the cervicofacial angle (82.8%), the jowls (93.1%), platysmal bands (93.1%) and malpositioned cervical fat (97.2%). Majority of patients were very satisfied with the treatment in terms of the aesthetic improvement. Complications involved the minor ecchymosis (17.2%) and minor skin circulatory problem (11.7%) in the early postoperative period, suture exposure (12.4%) in the postoperative 1st month, and cervical band reformation in the 6th (0.7%) and 18th (1.4%) months.

Conclusion In conclusion, lateral displacement and fixation of superolateral platysma flap to the mastoid fascia seems to be a useful neck lift technique for correction of platysma- and skin-derived aging signs with minor and manageable complications, immediate return to everyday activities and a high patient satisfaction.

Level of Evidence IV This journal requires that authors assign a level of evidence to each article. For a full description of these Evidence-Based Medicine ratings, please refer to the Table of Contents or the online Instructions to Authors www.springer.com/00266.

Keywords Neck rejuvenation · Novel neck lift technique · Superolateral platysma flap · Mastoid fascia · Platysmal band · Aesthetic outcome · Patient satisfaction

Introduction

The neck aging, derived by several changes in the aging process (i.e., skin quality/elasticity, loss of platysma muscle tone, and submental fat accumulation), occurs in conjunction with and often more rapidly or apparently than the facial aging [1–5]. Accordingly, some patients present with aging signs confined to the neck, and their primary concern in seeking rejuvenation is the correction of these features to address an imbalanced neck appearance in relation to the face [6, 7]. In such patients, isolated neck rejuvenation rather than the traditional cervicofacial rhytidectomy becomes the focus of surgery which targets the cervical facial angle, jowls, platysmal bands and malpositioned cervical fat [8, 9].

Isolated neck lift, as a more conservative approach with a faster recovery than traditional rhytidectomy, can result in significant aesthetic improvement when surgical

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intervention is selected properly in accordance with the individualized patient characteristics and expected treatment outcome [2, 10]. Indeed, the removal of excessive skin of the anterior, lateral, and/or posterior neck is considered the key parameter in the best postoperative outcome after a neck lift surgery [7, 11, 12].

Neck aging can manifest by retaining ligament attenuation resulting in platysma edge shortening and banding, particularly in the middle-aged individuals [2]. However, while the platysmal band formation is an unappealing feature and major contributor of the aging neck, the techniques conventionally used to treat platysmal laxity/malposition (i.e., excision, skin undermining, plication, platysma myotomy and platysma denervation) have largely failed with high rates of recurrence and suboptimal outcome [3, 10, 13–16]. Although the techniques based on a composite platysma-skin flap re-positioning are considered to be more valid options, a well-established technique with a potential to prevent platysma band formation remains an unmet need in the management of neck aging [15].

Herein, we describe a novel isolated neck lift technique, based on the lateral displacement and fixation of superolateral platysma flap to the mastoid fascia, enabling the lateral re-positioning of the longitudinal axis of the platysma muscle. With a potential for the prevention of the platysma band formation besides the correction of aging signs in the neck, this technique may be particularly useful in patients presenting with neck aging confined to skin- and platysma-derived changes. Accordingly, this study aimed to evaluate the utility of this novel neck lift technique (fixation superolateral platysma flap to the mastoid fascia) in terms of postoperative aesthetic outcome and patient satisfaction within an 18-month follow-up period.

Material and Methods

Study Population

A total of 145 female patients (mean age: 53 years, range 38–73 years) who underwent isolated neck lift operation with use of the superolateral platysma flap technique were included in this single-center study conducted between 2019 and 2023. Patients with remarkable sagging of face and facial aging signs, those with previous neck lift or any surgery in upper neck region, previous radiotherapy or multiple filling or high-energy-based (i.e., laser HIFU) interventions were excluded from the study.

The study was conducted in accordance with the ethical principles stated in the “Declaration of Helsinki”. Written informed consent was obtained from each subject for the operative procedures and for the use of patient data for publication purposes.

Assessments

Objective assessment, which was performed by the investigator using Global Aesthetic Improvement Scale (GAIS), and the patient reported outcomes were recorded at 6th and 18th months, postoperatively. The complications were recorded at early postoperative period and at 1, 6, and 18 months, postoperatively.

GAIS, which is a 5-point scale (worse, no change, improved, very improved and exceptionally improved), was used to rate global aesthetic improvement in the cervicofacial angle, jowls, platysmal bands and malpositioned cervical fats, compared to pretreatment, as judged by the investigator.

Patient-reported outcome assessment was based on subjective evaluation of appearance after treatment and satisfaction with the treatment using self-reported items, prior to the investigator’s evaluation. The appearance after treatment was assessed using a 5-point scale [very much improved (1), much improved (2), slightly improved (3), no change (4), or worsened (5)], while the satisfaction with the treatment was assessed using a three-point scale (very satisfied, satisfied, or not satisfied). Finally, the patients were asked whether they would recommend the treatment further to friends and acquaintances or not.

In addition, three aesthetic surgeons were asked to evaluate pre- and post-operational postoperative pictures of the patients and to rate the change by using a checklist prepared by the investigator. The checklist involved sections regarding the intended areas of correction (cervicofacial angle, jowls, platysmal bands and malpositioned cervical fats).

Operative Technique

Surgical operations were performed under local anesthesia ($n = 123$), local anesthesia plus sedation ($n = 18$) or general anesthesia ($n = 4$). Local anesthesia with lidocaine (Jetokain®, 4 vials) plus bupivacaine (Marcaine® 5 mL) in 100-ml saline was applied to an area extending from the postauricular mastoid area to mandibular line above and clavicular line below to involve entire neck. A skin incision was performed extending from inferolateral hairline to 1/3 superior part of postauricular area and then to earlobule. The flap was elevated over the fascia, inferiorly and anteriorly along the mastoid, while beyond the level of SCM, the dissection was advanced between platysma and skin till the midline (Fig 1). During dissection, it was aimed to stay below the mandible and above the clavicle without further advancing superiorly or inferiorly and to leave a 3-cm undissected area of skin at midline to prevent the concomitant shift of the contralateral skin during tightening of one side. Given the critical importance of preserving

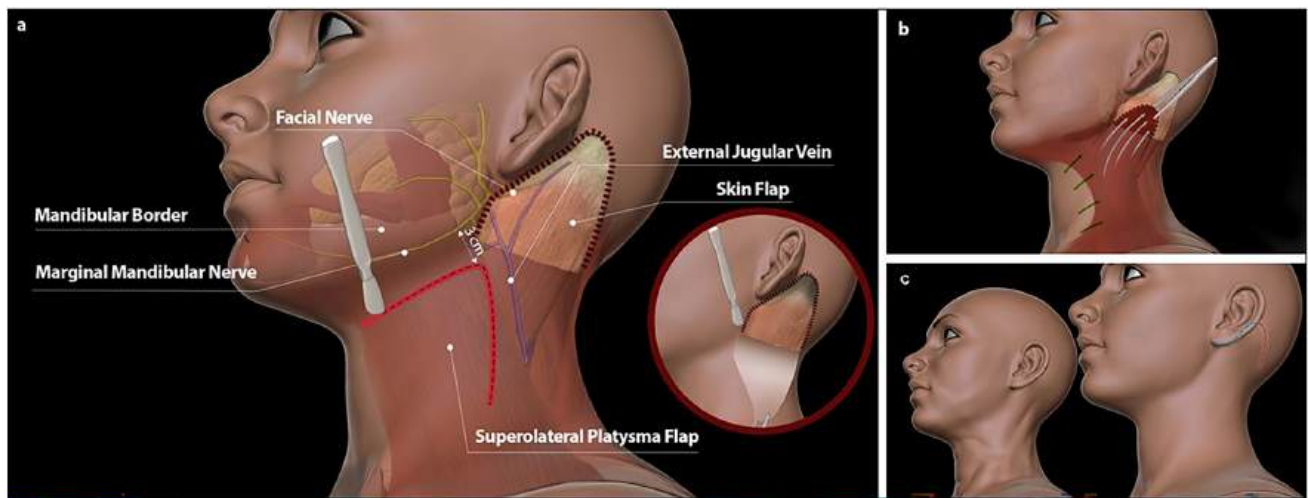


Fig. 1 **a** Flap planning and anatomical localization of platysma muscle, **b** lateral movement of platysma muscle following the intraoperative platysma to mastoid fascia fixation, **c** preoperative and postoperative appearance with the scar in the postauricular region

marginal mandible for the preparation of platysma flap, the upper incision border of the flap was planned at 2.5–3 cm below the mandibular angle and the nerve was kept in the safe zone (Fig 1, Video I, Video II). In the presence of significant infra- or supra-platysmal fat, fat tissue over the muscle and the submuscular fat tissue in submental area were removed via liposuction or using scissors. Following hemostasis, a careful dissection (without damaging the external jugular vein) was carried out via a 4-cm incision at superolateral part of platysma, medially from the cervicomental angle border above, and inferiorly perpendicular to superior SCM on the lateral side (Fig 2). During preparation of platysma flap, upper horizontal incision started from medial SCM-platysma juncture, medial to external jugular vein and 2–3 cm below the mandibular border, and then proceeded medially in the depth of muscle thickness. At this level, it is easy and safe to separate platysma muscle from the base which enables safe incision with the scissor

medially within the limits of muscle thickness (Fig 1, Video I, Video II).

After a 30 degree oblique superolateral tightening of the flap, it was fixed to the mastoid fascia, posterior to SCM, using continuous 4/0 polydioxanone (PDS®) suturing (Fig 2, Video III). Neck skin was pulled in the same direction after the fixation of platysma flap (Video III).

During flap preparation, since the superior part of platysma muscle (over the mandible) was separated from the inferior part, upper part of the flap remained loose with a greater volume over the mandible. Also, during the lateral tightening, the platysma moved medial-to-lateral with a volume, which created a tension in the neck as well as a volume increase in the adjacent mandibular border. Similarly, when the neck skin was tightened laterally, while the neck has become tight and flattened, the adjacent facial skin had no lateral movement and this created an accumulation in the preauricular mandibular angle region which

Fig. 2 Intraoperative procedures for flap stages: *Right* Prepared platysma flap, *Left* Fixation of platysma flap to mastoid fascia and SCM



remained as a volume gain in the mandible, particularly in cases with limited skin dissection over the mandible (Fig. 1, Fig. 2, Video I, Video IV). Skin remnants in the fixation point were pulled in the postauricular direction and then removed by cutting below the earlobe (Fig. 3). The fixation suture was approached to postauricular midline fascia to prevent the extra-tightness of the skin suture at earlobe level and thus to prevent the formation of scar or earlobe deformity in the long term. The 4/0 and 5/0 PDS® sutures were used for skin fixation and subcutaneous closure, respectively, without use of additional skin suture. The same procedure was applied to contralateral side of the neck (Fig. 3, Video V).

Patients operated under local anesthesia were sent home 30 min after the operation, while those underwent sedation or general anesthesia were sent home 2 hours and 24 hours after the operation, respectively. All patients received muscle relaxant (tizanidine) and non-steroidal anti-inflammatory (diclofenac sodium) treatment for the first week postoperatively. Postoperative follow-up was performed on day 1, day 7, week 3, month 3, month 6 and month 18 visits.

Results

Objective Assessment via GAIS

The median duration of follow-up was 18 months (range, 6 to 48 months). GAIS scores revealed exceptional

improvement in the cervicofacial angle (in 88.3% of patients at the 6th month and in 82.8% of patients at the 18th month), in the jowls (in 94.5% and 93.1% of patients, respectively), platysmal bands (in 94.5% and 93.1% of patients, respectively) and malpositioned cervical fat (in 97.9% and 97.2% of patients, respectively). Only one patient (0.7%) was considered to be unaltered in terms of cervicofacial angle and the jowls at the 6th month and 18th month assessments. None of the patients were considered to be unaltered in terms of platysmal bands and malpositioned cervical fat or worsened in terms of any parameter postoperatively (Table 1, Figs. 4, 5, 6, 7).

Patient-Reported Outcome

The appearance after treatment was reported to be very much improved in terms of the cervicofacial angle (by 95.2% of patients at 6th month and by 93.1% at 18th month), the jowls (by 94.5% and 93.1% of patients, respectively), platysmal bands (by 94.5% and 93.1% of patients, respectively) and malpositioned cervical fat (by 97.9% and 97.2% of patients, respectively). At postoperative 18th month, majority of patients reported that they were very satisfied with the treatment in terms of improvements in the cervicofacial angle (94.5%), jowls (97.2%), platysmal bands (99.3%) and malpositioned cervical fat (98.6%), and all indicated that they would recommend this treatment to friends and acquaintances (Table 2).



Fig. 3 *Left* Black line—Skin incision line **A** Post auricular incision apex point, **B** Post auricular incision mid-point. Red line—Skin flap skin excision line **Ā** New flap tip replacing the former postauricular apex point **B̄** The first point for the fixation suture that control the skin tightness of the neck, replacing the former post auricular incision mid-

point. *Middle* Skin flap with appropriate tightness is fixed to **B̄** and **Ā** points, and another fixation suture is placed between **B̄** ve **Ā**. Skin remnants to be excised are drawn. *Right* The closure of incision after removal of excess skin, with three separate 4/0 PDS sutures placed between **B̄** and **Ā** points to expand the area of the neck skin tightness

Table 1 Global aesthetic improvement scale (GAIS) results ($n = 145$)

	Cervicofacial angle		Jowls		Platysmal bands		Malpositioned cervical fat	
	6th mo	18th mo	6th mo	18th mo	6th mo	18th mo	6th mo	18th mo
<i>Improvement scale, n(%)</i>								
Exceptional improvement	128(88.3)	120(82.8)	137(94.5)	135(93.1)	137(94.5)	135(93.1)	142(97.9)	141(97.2)
Very improved patient	11(7.6)	19(13.1)	5(3.4)	7(4.8)	5 (3.4)	7 (4.8)	3(2.1)	4(2.8)
Improved patient	5(3.4)	5(3.4)	2(1.4)	2(1.4)	3(2.1)	3(2.1)	–	–
Unaltered patient	1(0.7)	1(0.7)	1(0.7)	1(0.7)	–	–	–	–
Worsened patient	–	–	–	–	–	–	–	–

6th mo: Postoperative 6th month; 18th mo: Postoperative 18th month

Fig. 4 Anterior, oblique and lateral views of a patient. *Upper row* Preoperatively and *Lower row* In the postoperative 6th month



Expert Surgeon Opinions

The results were also confirmed by consulting with three other independent plastic surgeons. After examining the preoperative and postoperative pictures, all three surgeons agreed that there were exceptional improvement or visible and effective corrections in the in the cervicofacial angle, jowls, platysmal bands and malpositioned cervical fat, at the postoperative 18th month.

Postoperative Complications ($n = 145$)

In the early postoperative period, minor ecchymosis ($n = 25$, 17.2%) and minor skin circulatory problem ($n = 17$, 11.7%) in the form of superficial skin necrosis (average 5 mm in size, active smoking for the last 10 years in 15[88.2%] patients) were the leading complications, which were transient and completely disappeared at the postoperative 1st month (Table 3).

Marginal mandibular nerve weakness was evident in 1.4% and 0.7% of patients in the early postoperative period

Fig. 5 Anterior, oblique and lateral views of a patient. *Upper row* Preoperatively and *Lower row* In the postoperative 6th month

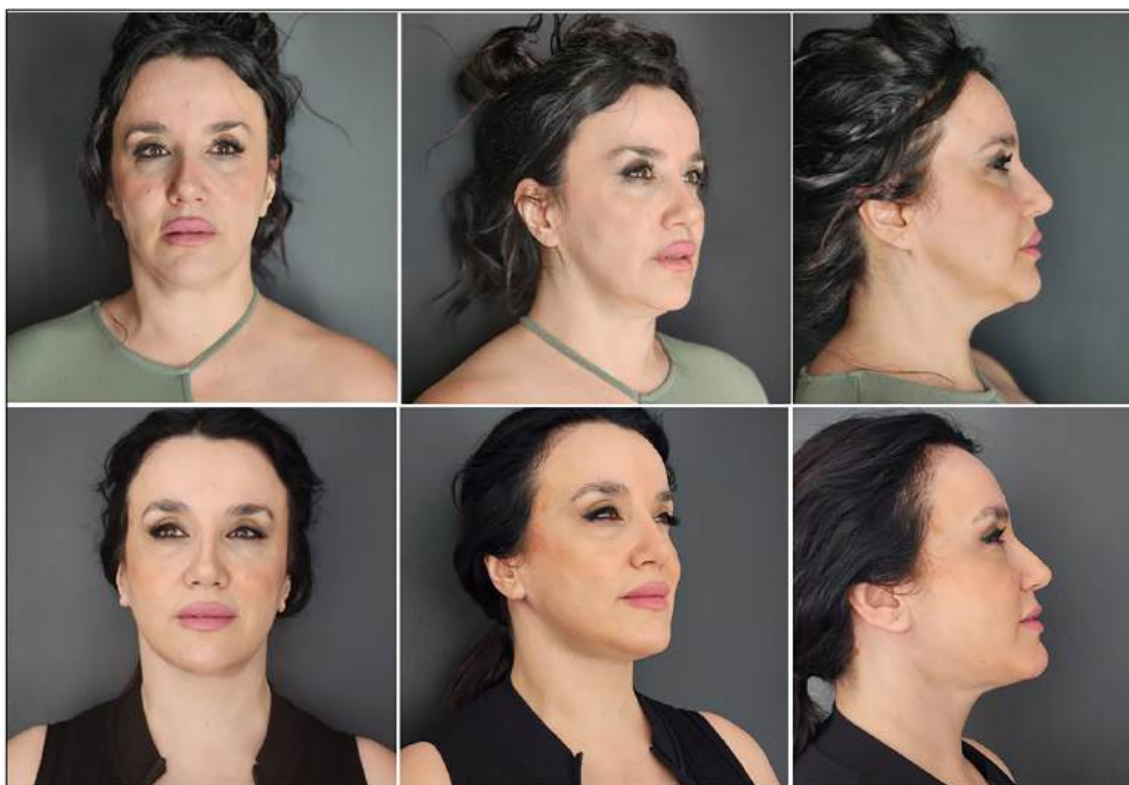


Fig. 6 Anterior, oblique and lateral views of a patient. *Upper row* Preoperatively and *Lower row* In the postoperative 13th month

Fig. 7 Anterior, oblique and lateral views of a patient. *Upper row* Preoperatively and *Lower row* In the postoperative 18th month



Table 2 Patient-reported outcomes ($n = 145$)

	Cervicofacial angle		Jowls		Platysmal bands		Malpositioned cervical fat	
	6th mo	18th mo	6th mo	18th mo	6th mo	18th mo	6th mo	18th mo
PROs, n(%)								
<i>Appearance after treatment</i>								
Very much improved	138(95.2)	135(93.1)	137(94.5)	135(93.1)	137(94.5)	135(93.1)	142(97.9)	141(97.2)
Much improved	5(3.4)	8(5.5)	6(4.1)	8(5.5)	8 (5.5)	10(6.9)	3(2.1)	4(2.8)
Slightly improved	1(0.7)	1(0.7)	1(0.7)	1(0.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
No change	1(0.7)	1(0.7)	1(0.7)	1(0.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
<i>Satisfaction with treatment</i>								
Very satisfied	138(95.2)	137(94.5)	142(97.9)	141(97.2)	145(100.0)	144(99.3)	145(100.0)	143(98.6)
Satisfied	6(4.1)	7(4.8)	2(1.4)	3(2.1)	0(0.0)	1 (0.7)	0(0.0)	2(1.4)
Not satisfied	1(0.7)	1(0.7)	1(0.7)	1(0.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
<i>Recommendation of treatment</i>								
Yes	145(100.0)	145(100.0)	145(100.0)	145(100.0)	145(100.0)	145(100.0)	145(100.0)	145(100.0)
No	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)

6th mo: Postoperative 6th month; 18th mo: Postoperative 18th month; *PROs* Patient-reported outcomes

and postoperative month1, respectively. Most frequent complication in the postoperative month 1 was suture exposure (12.4%) and the hypertrophic scar formation (2.8%) (Table 3).

At the 6th and 18th months of postoperative follow-up, the only complication was the cervical band reformation, which was noted in 0.7% and 1.4% of patients, respectively (Table 3).

Table 3 Postoperative complications ($n = 145$)

	Early postoperative period	Month 1	Month 6	Month 18
<i>Complications, n(%)</i>				
Hematoma	2(1.7)	–	–	–
Ecchymosis (minor)	25 (17.2)	–	–	–
Hypertrophic scar	–	4 (2.8)	–	–
Earlobe problem	–	–	–	–
Minor circulatory skin problem	17(11.7)	–	–	–
Asymmetry	–	–	–	–
Suture exposure	–	18(12.4)	–	–
Breaking of platysma flap fixation sutures	–	–	–	–
Marginal mandibular nerve weakness	2(1.4)	1(0.7)	–	–
Cervical band reformation	–	–	1(0.7)	2(1.4)

None of the patients developed an earlobe problem, asymmetry or breaking of platysma flap fixation sutures (Table 3).

Discussion

Our novel neck lift technique based on the lateral displacement and fixation of superolateral platysma flap to the mastoid fascia revealed a favorable postoperative outcome in terms of correction of aging signs (i.e., amelioration of the laxity and sagging in neck, the volume loss in the mandibular angle and the less-defined jawline) with minor and manageable complications and a high patient satisfaction. The results from multiple sources of data (GAIS scores, patient self-reports and expert surgeons' examinations) revealed that there was distinctive improvement in the intended areas of correction (cervicofacial angle, jowls, platysmal bands and malpositioned cervical fats).

The technique seems to be advantageous also for increasing the extent of skin removal by facilitating the lateral movement of medial neck skin, and for preventing the platysma band formation by enabling the lateral repositioning of the longitudinal axis of the platysma muscle.

The neck lift operation aims to create the features of an ideal neck shape, which is defined as a sharp cervicomenal angle, flat submental plane, well-defined jawline and smooth skin drape without platysmal banding, in a natural-appearing, long-lasting way [3, 13, 17, 18]. Importantly, in our technique, superolateral movement of platysma muscle concomitantly provides correction of subplatysmal structures, while its oblique lateral movement below the mandible moves the soft tissue of the jawline toward the mandibular angle. This, along with the postauricular tightening of the skin, enables volume formation by the soft tissue at jawline, improving the aging effects in these regions such as the volume loss in the mandibular angle and the less-defined jawline. Hence, fixation of

superolateral platysma flap to the mastoid fascia can be a good option for isolated neck lift surgery particularly in patients with problems related primarily to skin and platysma muscle and with normal or near-normal subplatysmal structures.

Given that most patients are considered to be able to return to work 2 weeks postoperatively after traditional rhytidectomy [8, 19], the likelihood of faster recovery and immediate return to everyday activities shortly following the procedure has become the major factor facilitating the decision of patients to undergo the neck lift operation with this technique. Women who had significant sagging in the neck despite absence of facial aging signs were particularly satisfied with this local operation. Alongside the fact that a major surgery is not necessary any more, the concomitant improvements in youthful appearance of the face such as a well-defined jawline and gain of mandibular angle volume seem also postpone a possible facial aesthetic surgery in these patients.

Increasing the extent of excess skin removal by facilitating the lateral movement of medial neck skin, this technique seems also be a favorable option given that the direct link between the successful outcome of a neck lift operation with the ability to remove as much as the excess skin [11, 12, 20, 21].

Nonetheless, isolated neck procedures do not address aging changes in the lower or middle facial thirds, and thus the high patient satisfaction reported in our study seems also to be related to the fact that patients are selected from those with platysmal problems in particular, and they were informed about the limits of isolated neck rejuvenation to address unrealistic expectations and avoid dissatisfaction [2].

In our technique, the superolateral pulling yields the tightening of platysma muscle till the mastoid along with concurrent superolateral movement of the covering skin, which enables the neck to appear slim and tight. The significant movement of the platysma muscle toward the

lateral side provides tilting of the longitudinal bands in the form of a horizontal U shape, limiting their power to create deformity. During 18-month follow-up, band formation recurred only in two patients including one patient among the 139 patients without complete muscle dissection and one patient among six patients with complete dissection. Hence, recurrence rate (2/145) in the present study demonstrates the success of the technique, while observation of reformation of band in the complete and partial dissection groups emphasize the likelihood of this complications to occur independent of the complete or partial muscle dissection. Hence, our neck lift technique may completely abolish the band formation without having to transect the bands, particularly in individuals without extremely hypertrophic platysma muscles. This is an important advantage given that platysma bands remain a most challenging and perplexing problem in neck surgery with failure of current techniques and thus high rates of recurrence and poor eventual outcome [14].

Pelle-Ceravolo et al. [22] described a novel lateral skin-platysma displacement technique for neck rejuvenation based on composite platysma-cutaneous flaps re-positioned laterally and the displacement of platysma muscle in a more lateral position to decrease the risk of paramedian bands recurrence. However, their technique, involving the use of platysma-cutaneous flaps in the combined face-neck lift operation, differs from our technique which is based on isolated neck lift. Although Pelle-Ceravolo et al. reported that the lateral tightening of the muscle-skin flap prepared from the mid-platysma was associated with favorable results in terms of prevention of band formation, their study presented no data regarding the postoperative outcome/status of the inferior part of the muscle which may cause accumulation and laxity in the inferior neck, particularly in cases with extensive sagging and laxity of platysma muscle [22]. In our technique, since the entire platysma (middle and inferior parts) is pulled superolaterally, it enables the improvement in platysma-derived laxity throughout the neck as well as tightening and rejuvenation in the inferior neck.

Given the technique described by Pelle-Ceravolo et al. [22] is a combined face-neck lift operation, it involves removal of excess neck skin through not only the postauricular, but also the preauricular incisions during the facial skin excision. In our technique, improvement of platysma laxity and removal of excess skin are accomplished leaving only a postauricular scar, besides a shorter operative time in relation to being a simple local anesthesia-based isolated neck lift operation.

The advantage of the ability to intervene the sub-mandibular gland under the platysma flap, when necessary, in the technique described by Pelle-Ceravolo et al. [22], is also valid for our technique. However, since patients with

extensive neck and face sagging are not included in our study, such an intervention was not required in our patient population. Pelle-Ceravolo, et al. described the main advantages of their technique as reversal of marked platysmal band formation and reduced risk of recurrence [22]. However, the authors also indicated the likelihood of failure of technique and risk of recurrence in case of hypertrophic bands as the major drawbacks of their technique. In this regard, recurrent band formation rates in our study seem to be acceptable.

Hodgkinson reported a technique based on suspension of platysma by a triple cable braided 2/0 suture to the cut edge of Loré's fascia in front of the tragus, rather than a platysma flap [23].

Although Hodgkinson's technique has an advantage of preserving muscle unity, this may also become a disadvantage in terms of the recurring band formation. Also, while the technique described by Hodgkinson was based on combined elevation of the face-neck skin flap and thus removal of excessive skin through not only the postauricular, but also the preauricular incisions [23], the scar burden was isolated to the post auricular area in our technique, leaving a short scar hidden in the postauricular area.

Notably, in a systematic review of 21 studies on the surgical management of platysmal bands, the composite platysma-skin flap re-positioning is considered to be a more valid and gradually accepted approach compared to other techniques such as wide skin undermining (with or without submental incisions), more extensive procedures (i.e., skin undermining and anterior platysma plication) or platysma myotomy and platysma denervation (emerging as effective less invasive surgical modalities) [15]. Also, "hyo neck lift" technique described by Le Louarn as a novel surgical maneuver using only the preauricular approach, in which the submental part of the platysma was extended toward the anterior cervico-mandibular angle and affixed to the hyoid [24]. Later on, in order to enable a more efficient and precise fixation, the technique was revised to include the fixation of the anterior platysma to the deep cervical fascia and suspension of the lateral platysma flap to the mastoid [25]. Hence, the fixation of the anterior platysma to the deep cervical fascia and suspension of the lateral platysma to mastoid was reported to permit to create a horizontal and posterior vector of tension on both platysma and skin, which induces flattening of the submental area and consequently creates or recreates an acute cervico-mandibular angle [25].

Complications related to isolated neck rejuvenation vary depending on the extent of the procedure and may include seroma and hematoma (occurring in approximately 1% of cases), nerve injuries, sialoceles, infection and skin necrosis [2, 26, 27]. Nonetheless, the most common complication in the aesthetic procedure of the neck is likely surface contour

irregularities and the dynamic tethering of the skin onto the underlying platysma due to extreme reduction of volume, which may require re-intervention [8, 28].

In our series, the complications involved the minor circulatory skin problem (11.7%) particularly in active smokers, which was recovered without (8.9% in 2 weeks) or with (2.7% in 3 weeks) postauricular (hidden) scar in all cases, in addition to the exposition of PDS sutures (12.4%), transient ecchymosis in the lower neck (17.2%, for 7 to 10 days) and the hematoma (2.0%) which was controlled by drainage and cauterization. The tightening of platysma decreases the subcutaneous space and thus with the help of a good hemostasis and a light cervical compression bandage, drainage was not needed. In our series, development of hematoma in three cases seems to be acceptable given that drainage was not applied in any of the patients. Additionally, use of 5–7 days pressure dressing seemed to limit the ecchymosis to the lower neck area and thus patients were able to return to normal daily life within a week, while some patients returned to work two days after the operation by hiding the elastic bandage with clothes (i.e., shirt collar, scarf). The elevation of a postauricular skin flap in local neck lift operations, instead of face-neck skin flap elevated in full face lift operations, reduces the risk of the skin flap necrosis in those at high risk of skin necrosis (i.e., smokers, circulatory problem, diabetes). In our series, while partial circulatory disturbance in skin occurred in some heavy smokers, all of them recovered without necessitating an extra surgical intervention, which seems to be related to the use of less extensive skin flap.

Earlobe deformity, which is among the noticeable complaints following the lower face and neck lift surgery [29, 30], was not observed with our technique which involves the placement of the fixation suture to the middle part of the postauricular area, preventing the movement of earlobe medially during a potential loosening and thus the formation of a deformity. Indeed, the isolation of the scar burden to the post auricular region and prevention of earlobe deformity (via three separate sutures from midline to posterior to decrease the tension of skin flap) rather than the mastoid fixation technique seems to be the main novelties of the technique. Although postauricular pulling of the neck skin created skin collections at the front of earlobe in some patients ($n = 7$, including four patients with obesity ($n = 4$) and three patients with extreme sagging skin), these were eliminated and hidden under the earlobe and not become permanent in any of cases. Nonetheless, in cases with excessive skin accumulation below the earlobe, the dog ear formed over the suture can be excised leaving a well-hidden scar in the natural skin line in front of the earlobe.

Similarly, some authors also reported a more natural look for earlobe after surgery by a simple modification of

the incision around the earlobe (i.e., incision just at the most prominent area of earlobe attachment to the facial skin, posterior triangular incision to the earlobe anchored to the mastoid fascia) [29, 31, 32].

Overall, main advantages of our technique include its implementation as a local anesthesia-based day surgery, its ability to address aging signs in the neck, sagging of platysma and band formation individually and synergistically, as well as the correction of volume loss in the mandibular angle and the less-defined jawline, its utility as an isolated neck lift technique in patients presenting with neck aging confined to skin- and platysma-derived changes, use of three different postauricular suspensory sutures from midline to posterior to decrease the tension of skin flap which prevent appearance of emergence of earlobe deformity, and skin necrosis or large scar formation due to tension, large surgical field of view extending to the mandibular angle which enables further interventions regarding the gland surgery and deep neck structures when necessary, and leaving a short scar hidden in the postauricular area despite the extension of the surgical field.

Main limitations of the technique are its inadequacy in patients presenting with strong platysmal bands, marked submandibular gland, extensive facial and cervical sagging, its inability to completely abolish the possibility of recurring platysmal band formation, and the need for anterior approach in the presence of perihyoid fascia, digastric muscle hypertrophy and extensive submental fat.

Strengths and Limitations of this Study

The major strength of the study seems to be the comprehensive assessment of postoperative outcome, objectively by the investigator using GAIS in addition to the patient reported outcomes and independent review of three aesthetic surgeons using a checklist within an 18-month follow-up period. However, the study has certain limitations such as small patient group due to single-center design, and inability to provide solid data on the likelihood of further interventions regarding the gland surgery and deep neck structures with this technique given the exclusion of patients with remarkable sagging of face and facial aging signs.

Conclusions

In conclusion, lateral displacement and fixation of superolateral platysma flap to the mastoid fascia seems to be a useful neck lift technique for correction of aging signs (i.e., amelioration of the laxity and sagging in neck, the volume loss in the mandibular angle and the less-defined jawline) with minor and manageable complications, and a high

patient satisfaction. The technique seems also be advantageous for increasing the extent of skin removal by facilitating the lateral movement of medial neck skin, and for preventing the platysma band formation by enabling the lateral re-positioning of the longitudinal axis of the platysma muscle. Neck lift with fixation of superolateral platysma flap to the mastoid fascia seems to be a good alternative in individuals with platysma- and skin-derived aging signs in the neck, as a local anesthesia-based day surgery enabling immediate return to everyday activities shortly after the procedure. This technique can also be used as a complementary platysma flap procedure for neck rejuvenation in full face lift operations.

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Declarations

Conflict of interest The author declares that he has no conflict of interest.

Human Rights and Informed Consent The study was conducted in accordance with the ethical principles stated in the “Declaration of Helsinki.” Written informed consent was obtained from each subject for the operative procedures and for the use of patient data for publication purposes.

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