Light-Guided Percutaneous Neck Rejuvenation With Division of Platysma Bands and Suture Suspension: A Multicenter Retrospective Study

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Abstract

Background: Traditional invasive suture suspension techniques have proven efficacy and durability. A previously described percutaneous placement of a neck suspension suture with light guidance has transformed this into a minimally invasive technique. This novel technique provides a major advance for minimally invasive neck rejuvenation.

Objectives: The authors sought to describe their experience with light-guided percutaneous neck rejuvenation over the past 4.5 years, including technique, patient selection, safety profile, and expected outcomes.

Methods: Data were retrospectively reviewed for all patients who underwent the procedure with 5 surgeons across 4 aesthetic plastic surgery practices from January 2018 through May 2022. Inclusion criteria were mild to moderate neck laxity, prominent anterior platysma bands, and desire to improve neck contour. Patients undergoing concurrent skin incision >5 mm (ie, open rhytidectomy or platysmaplasty) were excluded.

Results: A total of 391 patients meeting criteria were identified during the study period. No hematomas were documented. Four patients (1%) developed infection at the suture site, 1 resolving on antibiotics and 3 requiring suture removal. Eighteen (4.6%) developed recurrent platysmal bands, and 7 (1.8%) had residual loose skin. Four (1%) experienced transient marginal mandibular neuropraxia. Mean length of follow-up time was 240 days.

Conclusions: Light-guided percutaneous suture suspension is a safe and viable option for improving neck contours. Although it does not address extensive skin laxity or excess submental fat, it can be combined with energy-based tissue tightening, submental liposuction, or skin excision. In selected patients, this minimally invasive procedure provides predictable results with a low risk of complications.

Level of Evidence: 3

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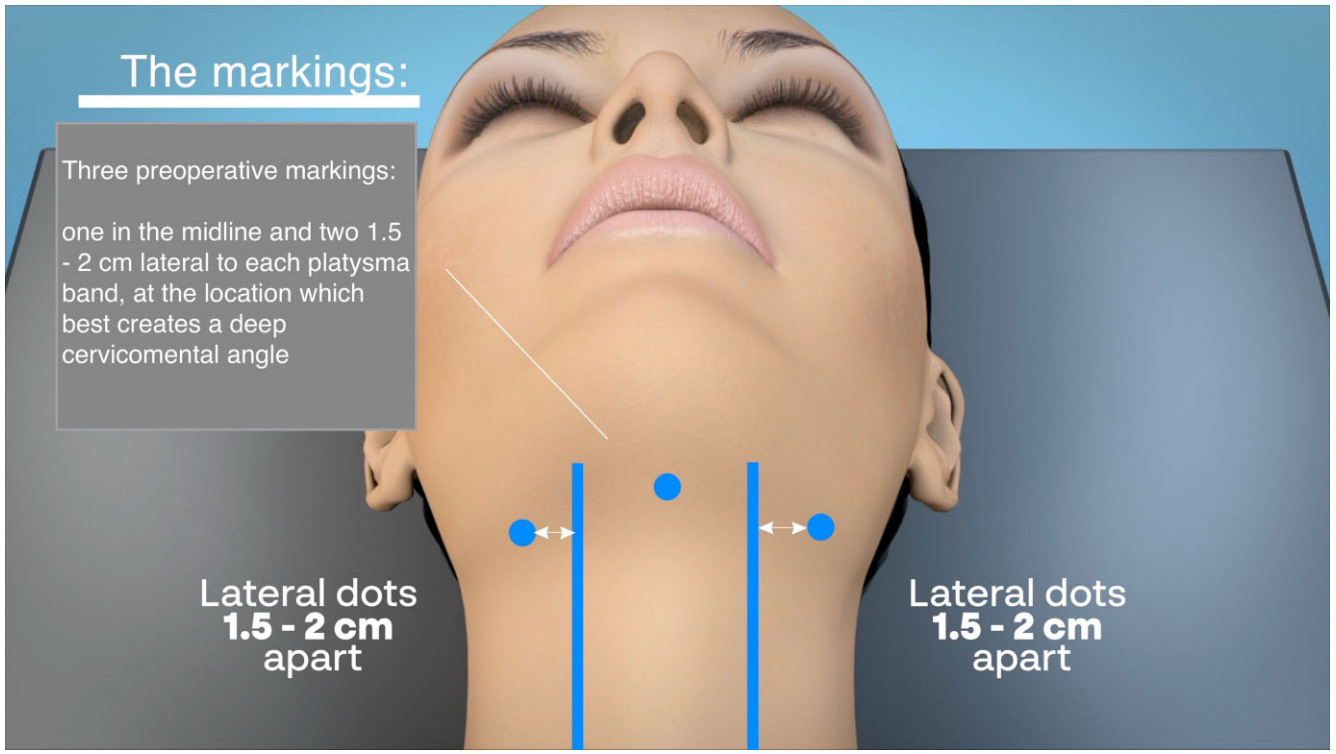


Figure 1. Preoperative markings. Three access sites are marked for platysma band division and insertion of the rod and attached suture (Reproduced with permission from Cynosure, LLC; Westford, MA).

Aging of the neck is characterized by a loss of skin elasticity and is often accompanied by increased submental fat, ptosis of the neck, and weakening of the platysma muscle. As a result, the inferior border of the mandible often loses definition, prompting patients to seek neck rejuvenation. Skin and platysma laxity, in conjunction with banding along the muscle's borders, gives rise to an obtuse cervicomental angle and loss of the more defined neckline patients enjoyed in their youth. In addition, fat and ptotic submandibular glands can also contribute to the loss of neck contours.

Modification of the platysma has long been recognized as a crucial step in achieving a youthful neck. Initial techniques relied on open approaches to create a muscle corset that reinforced the subplatysmal structures.[1] The utilization of percutaneous sutures to elevate the platysma and recontour the neck was first introduced in the mid-1990s.[2] This technique combined liposuction of submental and submandibular areas with partial resection and suturing of the platysma muscle. Interlocking nonabsorbable sutures located in the midline of the platysma were extended through a subcutaneous tunnel along the mandibular border and sutured to the deep mastoid fascia, resulting in a defined mandibular border and improved cervicomental angle. Long-term studies examining the efficacy of suture suspension platysmaplasty demonstrated a low complication rate and high patient satisfaction at 13 years.[3,4] However, early iterations of the procedure required invasive resection of the platysma muscle through a submental scar as well as elevation of the skin overlying the platysma.

More recently, several percutaneous approaches have been described, such as threadlifts and percutaneous suspension sutures. These percutaneous techniques require placing the sutures blindly and are thus highly dependent on surgeon experience. Similarly, long-term studies have demonstrated that threadlifts provide limited improvement with poor long-term durability.[5] In contrast, other less invasive methods have been described to address platysma bands, such as closed platysma myotomy, with demonstrated satisfactory results.[6]

Due to increasing demand for less invasive procedures and an increase in patients presenting for facial rejuvenation at younger ages, the suture suspension technique has continued to evolve and garner a great deal of interest. The trampoline platysmaplasty technique, introduced in 2011 by one of the authors (G.M.), involves placement of subcutaneous suture strands through small punctures along the anterior neck and lateral jawline, creating a matrix that elevates and suspends the platysma.[7] This technique employs a novel light transillumination system to effectively monitor the depth of

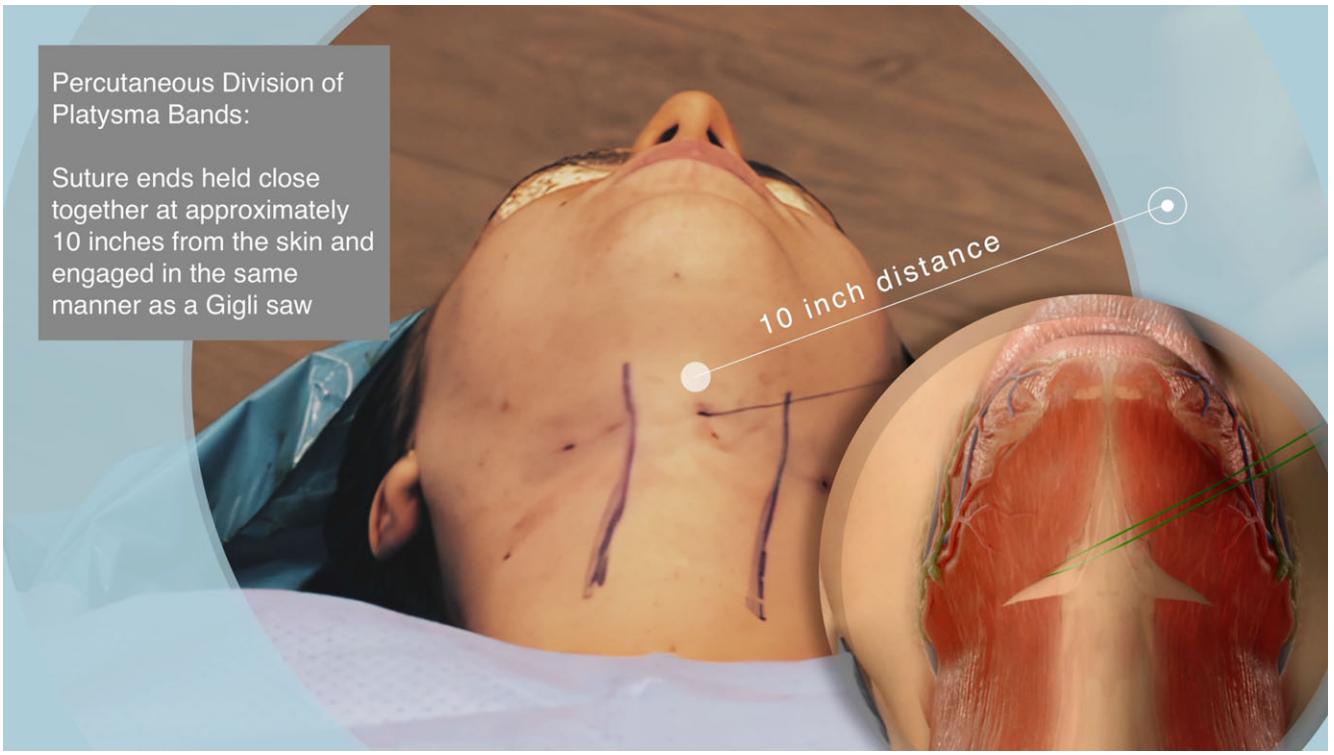


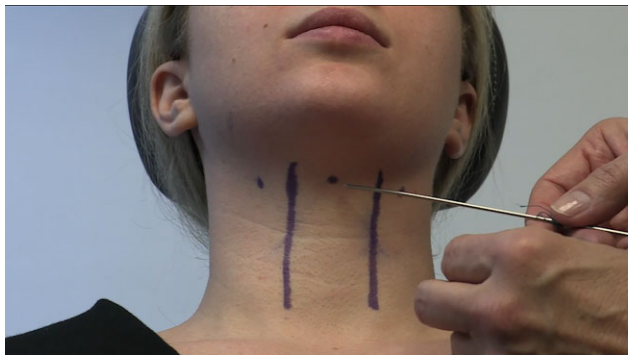
Figure 2. Percutaneous division of platysma bands. (Reproduced with permission from Cynosure, LLC; Westford, MA).

suture passage, ensuring proper placement of the support matrix between the platysma muscle and the skin. Furthermore, the continuous suture is anchored to robust retaining ligaments, which contain sufficient tensile strength to secure the trampoline matrix. Although generally effective, this early technique was complex and highly dependent on the operator and their experience.

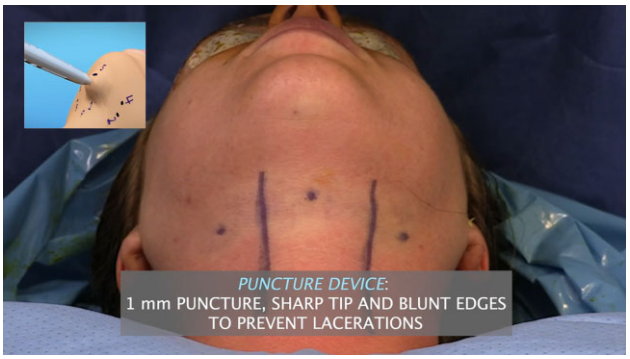
Refinement of this technique eventually led to the utilization of a continuous suspension suture placed under the mandibular border utilizing a novel bidirectional transillumination suture delivery system called the ICLED Surgical Suture System (Cynosure, LLC; Westford, MA). A key element of this system is the suture rod, a 9-inch fiber optic rod attached to a 100-inch 4-0 braided polyester suture (Suturod light-guided technology; Cynosure). A light handle can be attached to the suture rod to provide light transillumination and allows the surgeon to accurately determine the direction and depth of travel along the subcutaneous tissue.

The original suspension technique employed smooth, monofilament sutures that tended to act like a “cheese-cutting wire” when placed under significant tension. To prevent this, both barbed and braided sutures have been proposed as an alternative. Our experience has been that braided sutures placed under lower tension provide sufficient support of tissues along the neck and exert a lower resistance than barbed sutures when passed through the subcutaneous tissues, resulting in less cutting of the tissues and a more even distribution of tissue across the length of the suture. Additionally, barbed sutures are unable to be redirected once engaged with the tissue. Therefore, we elected to employ a non-absorbable braided suture that provides adequate support and tension while minimizing tissue trauma.

The single suture suspension system is delivered over the surface of the underlying muscle, weaving the suture strand in and around the retinaculum cutis. The right and left sides of the suture loop are anchored around the mastoid-cutaneous and platysma-auricular ligaments, creating upward forces that emphasize definition at the cervicomental angle and improve the contour along the angle of the mandible. Preservation of the retinaculum cutis underneath the jawline also locks the suture strands in place, preventing migration. Through a series of small punctures below the mandibular border, the surgeon is able to divide platysmal bands, deliver energy-based skin tightening, perform submental liposuction, and construct the simple suspension system that elevates and supports the underlying platysma while enhancing the cervicomental angle and jawline. The present paper describes our experience with this percutaneous suture suspension technique using the MyEllevate procedure (Cynosure) across 4 private plastic surgery practices with a cumulative total of nearly 400 cases performed.



Video 1. Preoperative markings.



Video 2. Percutaneous division of platysma bands.

METHODS

A multicenter retrospective analysis of patients undergoing light-guided percutaneous suture suspension (MyEllevate) was conducted over 53 months, from January 2018 to May 2022. After obtaining IRB approval from Allendale Investigational Review Board of Regulatory and Technical Associates Inc. registered with the FDA (Protocol #7053-RETRO-2022), patient data were obtained from 4 separate private practices (GM, Beverly Hills, CA; JP and JC, Boca Raton, FL; MT, Dallas, TX; BD and DT, Montclair, NJ). All patient images were obtained following written consent.

Data for this cohort study were collected retrospectively via chart review. Inclusion criteria were mild to moderate neck laxity, prominent anterior platysmal banding, and desire to improve neck contour. Patients were excluded if they had any concurrent neck procedure requiring an incision >5 mm (ie, concurrent rhytidectomy). Patient demographics, including gender, age, BMI, smoking status, previous surgery to the neck, type of anesthesia, and length of follow-up were abstracted from the medical record. Patient race and ethnicity were not collected due their absence in the medical records. Outcome measures included complication rates and revision rates.

All patients included in the study presented with dynamic platysma bands, observed on forced contraction of the platysma during preoperative evaluation. Skin laxity was addressed based on a validated tool for assessment of the cervicomental angle (CMA), which categorizes the CMA on a grade from 1 to 5, from no skin laxity to extreme laxity of the cervical skin.[8] Patients with a grade I (no laxity), II (mild laxity of the cervical skin that does not reach the notch of the thyroid cartilage), and some grade III (moderate laxity of the vertical skin that exceeds the notch of the thyroid cartilage and forms an upward curved line between the suprasternal notch) were included in the study. Individuals with grade IV (severe laxity of the cervical skin) and grade V laxity, characterized by extreme laxity of the cervical skin and a downward curved line between the chin and suprasternal notch, were not included in the study given their need for face lift in combination with percutaneous loop suspension.

MyEllevate Procedure

Patient Selection and Preoperative Planning

Loss of definition of the neck contour can be caused by a variety of reasons: (1) loss of dermal elasticity with sagging of the skin; (2) ptosis of the underlying soft tissues in the neck and chin; (3) banding of the platysma muscles at the anterior neck; (4) increased fat deposition; and (5) submandibular gland protrusion.

Patients were considered good candidates for the procedure if they desired minimally invasive isolated neck rejuvenation and presented with platysma banding and/or subcutaneous laxity despite otherwise good skin elasticity. If excess submental fat was present, submental liposuction was included in the procedure. Most individuals also underwent simultaneous radiofrequency or laser energy to the neck to address soft tissue laxity. Patients seeking improvement in jowling were advised that this procedure primarily targets the neck, not the jowl. Therefore, it will not significantly improve jowling or facial laxity.

Older patients with a history of a previous facelift who had developed recurrent platysmal laxity or banding were also adequate candidates, provided they did not need additional skin excision or significant correction of jowling. In this population, the percutaneous approach allows division of recurrent platysmal bands, and the suspension suture augments the cervicomental angle by addressing platysmal laxity. This procedure can be performed in the office under local anesthesia, making it an attractive alternative to a more invasive open revision.

Preoperative Markings

While sitting upright in the preoperative area, patients were asked to flex the platysma muscle by actively engaging the lower lip depressors and showing the lower teeth. In most

Video 3. Placement of suture suspension.

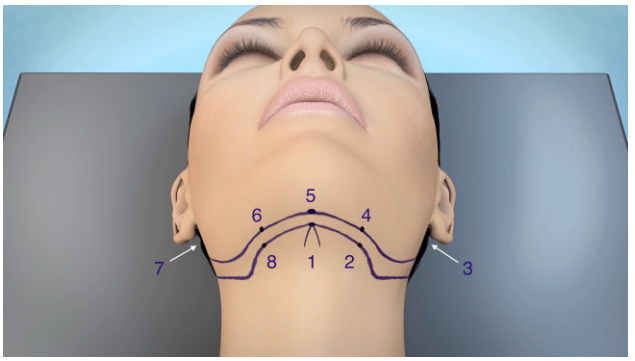


Figure 3. Eight puncture sites are required for insertion of percutaneous suture suspension. The numbers correspond with the course of the suture suspension loop (Reproduced with permission from Cynosure, LLC; Westford, MA).

patients, 1 or 2 dynamic anterior platysma bands were identified and marked. Puncture sites were marked 2 cm medial and lateral to each band at the level of the desired cervicomental angle (Figure 1). These punctures represent the level of the platysma band division and the sites of insertion of the rod and attached suture. An example of the markings can be seen in Video 1.

Positioning and Infiltration of Local Anesthesia

To begin the procedure, the patient was positioned on the operating table with the neck extended to maximize exposure. An occlusive dressing was applied to protect the eyes, and the skin of the face and neck was prepped and draped in a standard sterile fashion, taking care to prep the hair and the area behind the ear.

To facilitate the dissection, improve pain control, and reduce bruising, local lidocaine with epinephrine was injected superficial and deep to the platysma bands (9 mL of 1% lidocaine and epinephrine [1:100,000], 1 mL sodium bicarbonate). Access to the anterior platysma border was achieved by pinching the skin and underlying muscle band during active contraction of the muscle and distracting it away from deeper structures. Care was taken to only inject 2 to 3 mL of the local anesthetic into the underlying muscle band and subcutaneous space to prevent distortion of anatomy. Additional access sites for the injection of tumescent fluid, tunneling and liposuction in the submentum, as well as the right and left earlobe junctions, received 1 mL of local anesthetic each. Lastly, approximately 4 to 5 mL of local anesthetic were injected over the mastoid on both sides.

Division of Platysma Bands

Using the 2-mm puncture device, access sites were established at the previously marked locations 2 cm medial and lateral to the identified platysma bands. The included clearing tool was then employed to bluntly dissect deep to the platysma bands. The rod and attached suture were introduced through the midline puncture, passed around the posterior edge of the platysma band and then reversed in direction through the subcutaneous space, advancing along the anterior surface of the muscle. This maneuver enabled the suture to surround the platysma band. The suture material itself was then used in the same manner as a Gigli saw, resulting in the cutting of the platysma band (Figure 2).[6] Details of band division can be seen in Video 2.

Placement of the Suspension Suture

Next, a template was utilized to identify remaining access sites for the suture rod. These sites can also allow access for energy-based skin tightening and liposuction, provided they are performed prior to placement of the suspension suture. The entire neck region was then infiltrated with a minimum volume of 250 to 300 cc of tumescent solution (1 L normal saline with 50 mL of 1% lidocaine and 1 mL of 1:1000 epinephrine). Larger volumes of tumescent were used in patients undergoing simultaneous liposuction or subcutaneous energy-based tightening. After allowing adequate time for maximal epinephrine effect and after performing any liposuction or tightening adjuncts, we proceeded with placement of the suspension suture, described in detail in Video 3.

Employing the 2-mm puncture device, a total of 8 access sites were created for the light-guided suture rod (Figure 3). Two access sites were located behind the ear, along the mastoid fascia, and allowed access to the mastoid-cutaneous and platysma-auricular ligaments which served as an anchor site for the suture suspension. The remaining 6 sites were located along the cervicomental angle and served as pivot points for continuous passage of the suture. A dermal clearing tool was inserted at each access site to release dermal attachments. A light handle was then attached to the suture rod to provide transillumination and judge depth during suture placement.

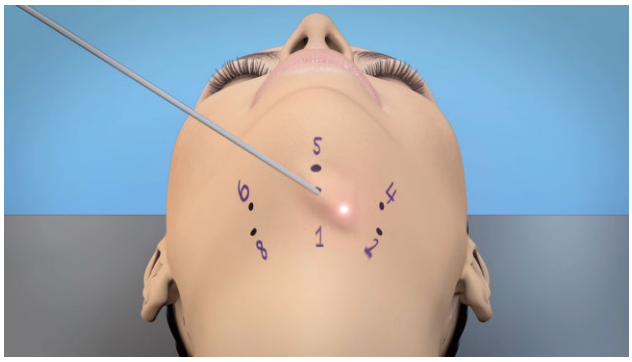


Figure 4. Light guide insertion through the midline puncture. A bright yellow light indicates correct placement of the rod in the subcutaneous layer (Reproduced with permission from Cynosure, LLC; Westford, MA).

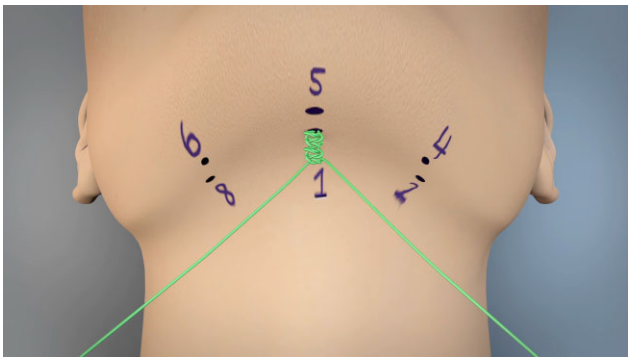


Figure 5. Securement of suture suspension at the cervicomental angle. The knot is subsequently retracted into the subcutaneous space (Reproduced with permission from Cynosure, LLC; Westford, MA).

The light-guide was inserted through the midline puncture until a bright yellow spot was observed in the subcutaneous layer, confirming the correct depth of travel (Figure 4). As the rod was passed underneath the skin, the surgeon observed the light; if it suddenly changed to dull red, this indicated that the rod had passed deep to a segment of the platysma muscle. While passing the lightguide through each access point, care was taken to not fully remove the rod from the subcutaneous space, ensuring that the continuous suture was maintained in the correct depth.

Once the suture reached the postauricular access point, the lightguide was rotated 45° to 90° to engage the mastoid-cutaneous and platysma-auricular ligaments which served as a lateral anchor point. The remaining holes were then employed to advance the suture back to the midline to exit through the midline puncture superior to the puncture where it was first inserted. The suspension was secured by tying the suture ends together in the usual fashion (Figure 5). The knot was retracted into the subcutaneous space and a soft cervical collar was applied to the patient.

Postoperative Care

The soft cervical collar was left in place for 10 days, removed only for showering, to reduce the risk of recurrent platysmal banding and to reduce swelling. As part of the postoperative protocol, patients were instructed to avoid vigorous activity and to sleep with their head elevated for several days to further reduce swelling. They were also directed to massage any lumps and bumps that may appear and reassured that these would go away on their own.

Statistics

SPSS v24.0 software (IBM; Armonk, NY) was employed for all statistical analyses. Descriptive analysis was performed employing standard statistical procedures. Hypothesis testing was carried out with a *t* test for parametric data and Mann-Whitney U for non-parametric data. Fisher's exact testing was utilized for comparison between categorical variables. Statistical significance was set at $P \leq 0.05$.

RESULTS

Demographics

From January 2018 through May 2022, 391 patients underwent the light-guided percutaneous procedure across 4 centers. Average age was 52 years (median, 53, standard deviation [SD] = 10.6, range, 25-81 years). A total of 315 (81%) of the patients were female, and 76 (19%) were male. Average BMI was 24.4 kg/m^2 (median, 24, SD = 3.7, range, 17-40 kg/m^2). Thirteen (3.4%) were active smokers. In addition, 111 (28.5%) had prior aesthetic treatment of the neck. Mean follow-up time was 240 days (median, 109, SD = 299, range, 1 day to 3.9 years). Patient demographics are listed in Table 1. Figures 6 to 8 demonstrate preoperative and postoperative views of patients who underwent the light-guided percutaneous procedure at various follow-up times: 1 month, 2 months, and 5 months, respectively.

Concurrent Procedures

In conjunction with the light-guided percutaneous neck rejuvenation, 97% of patients elected to undergo concurrent neck therapy, which primarily consisted of energy-based subcutaneous tissue tightening with or without submental liposuction (see Table 2 for details). The majority (71%) of procedures were performed in the office under local anesthesia, with the remaining 29% performed under either IV sedation or general anesthesia in an outpatient setting.

Table 1. Patient Demographics

Gender	
Male	76 (19.4)
Female	315 (80.6)
Age, mean [median] (SD)	52 [53] (10.6)
BMI[a] (Kg/m^2), mean [median] (SD)	24.4 [24.0] (3.77)
Active Smoker, N. (%)	13 (3.4)
Prior treatment impacting neck, N. (%)	111 (28.4)
Skin excision (facelift or neck lift)	40 (10.2)
Chin implant	4 (1.2)
Percutaneous suture suspension involving the neck	23 (5.9)
Trampoline platysmaplasty	8 (2.0)
Energy-based tightening	49 (12.5)
Submental liposuction	19 (4.9)
Non-invasive fat reduction (deoxycholic acid, mesotherapy, cryolipolysis)	4 (1.0)
Anesthesia, N. (%)	
Local	275 (70.7)
IV sedation or general	114 (29.3)
Length of follow up, mean [median] (SD) days	240 [109] (299)

[a]BMI data was obtained from 3 of 4 sites.

Table 2. Concurrent Neck Procedures

Devices targeting skin	No. (%)
Not performed	373 (95.4%)
RF Microneedling (Morpheus or Potenza [Cynosure, Westford, MA])	18 (4.6%)
Devices targeting subcutaneous tissue	
Not performed	43 (11%)
1440-nm laser in subcutaneous space (SmartLipo [Cynosure, Inc., Westford, MA])	45 (11.5%)
Renuvion (Apyx Medical, Clearwater, FL)	3 (0.77%)
Bipolar RF (Accutite Facetite [InMode, Irvine, CA])	300 (76.7%)
Submental liposuction	
Liposuction alone	26 (6.6%)
Liposuction and energy-based tightening	168 (43.0%)

RF, radiofrequency.

Adverse Events

The most common adverse event was recurrent platysma banding (n = 18, 4.6%) followed by residual skin laxity (n = 7, 1.8%). Four patients (1%) developed short-lived transient marginal mandibular neuropraxia. Four infections occurred (1%), with 1 patient responding to a course of oral antibiotics and 3 requiring suture removal. There were 2 small seromas in patients who also received AccuTite radiofrequency treatment. Both were successfully aspirated in the office. No postoperative hematomas or bleeding complications were noted. A list of adverse events is included in Table 3.

Upon statistical analysis, age, gender, BMI, and smoking status were not associated with higher rates of complication. Similarly, having a history of surgical or nonsurgical treatment to the neck was not associated with increased complication rate. Because the overwhelming most patients underwent concurrent neck procedures (97%), there was not adequate statistical power to evaluate the impact of concurrent neck therapy on complications.

Revision

Patients were generally satisfied with their outcomes. Only 7.2% (28 patients) required a revision either in the office or operating room (OR). Eight patients (2.0%) required revision in the OR due to residual excess skin (n = 2), recurrent platysma bands (n = 4), and infection requiring suture removal (n = 2). Twenty patients (5.1%) underwent revision in the office. Reasons for office revision included recurrent platysma bands (n = 12), residual skin laxity (n = 6), and seroma (n = 2).

A number of patients have maintained long-term follow-up. At the time of data collection, 11 patients were seen in the practice at time points between 3 and 4 years postoperation. Among this subset, results have thus far been generally durable, and only 1 of the 11 required revision for recurrent laxity (performed approximately 1 year after the index procedure).

DISCUSSION

Patients seeking neck rejuvenation often desire a well-defined neck and clear jawline. Most age-related changes to the neck result from changes to the skin and subcutaneous tissue, submental fat, and platysma muscle. Many patients desire less invasive procedures that can address superficial structures of the neck. This is corroborated by a recent survey of ASPS members, which indicated that over the past 20 years, submental incisions have become less common during facelift surgery.[9] The same survey, however, found that the basic approach to the face and

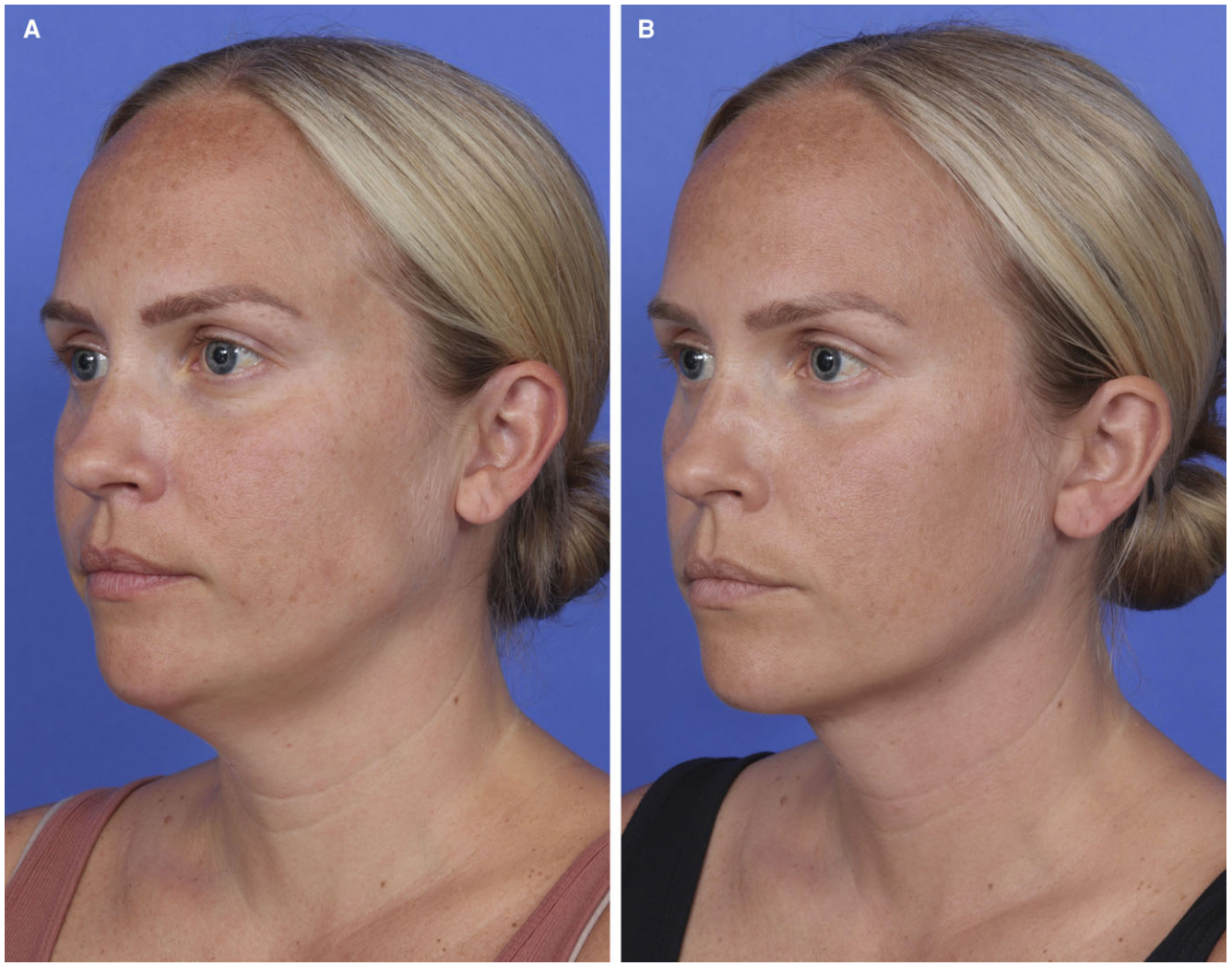


Figure 6. This 39-year-old female presented with an obtuse cervicomental angle, plastysma banding, and skin laxity. She underwent light-guided percutaneous neck suspension with neck liposuction and energy-based skin tightening. (A) Preoperative vs (B) 1-month postoperative view.

neck has not changed dramatically over this same time period.

The minimally invasive approach to the neck has gradually gained traction with 3 important milestones. First, liposuction provided a less invasive way of addressing excess submental fat.[10] Second, the neck suture suspension described by Giampapa and DiBernardo in the mid-1990s provided a new modality for enhancing the cervicomental angle and addressing soft tissue laxity.[3] Third, in 2010 the development of energy-based techniques for skin and subcutaneous tissue tightening allowed for modest skin tightening without excision.

However, until recently, further progress was limited due to difficulty addressing platysmal bands and lax platysma without an open approach. The present technique overcomes this by providing a percutaneous means of addressing both platysmal bands and platysmal laxity. This represents a major advancement in minimally invasive neck rejuvenation.

Our experience after nearly 400 patients reveals that this technique is generally well tolerated when performed in the office under local anesthesia and has an acceptable minor complication rate with very little risk of major complications. Importantly, most complications were minor and were easily addressed in the office. Mild contour irregularities may be seen in the early postoperative period and generally improve with time. Persistent lumps and bumps can be successfully treated with Kenalog injection and massage. Our infection rate of 1% was similar to other studies employing subcutaneous sutures.[11] If infection is seen, a trial of antibiotics is warranted, but most of these patients ultimately required suture removal. Similarly, some patients

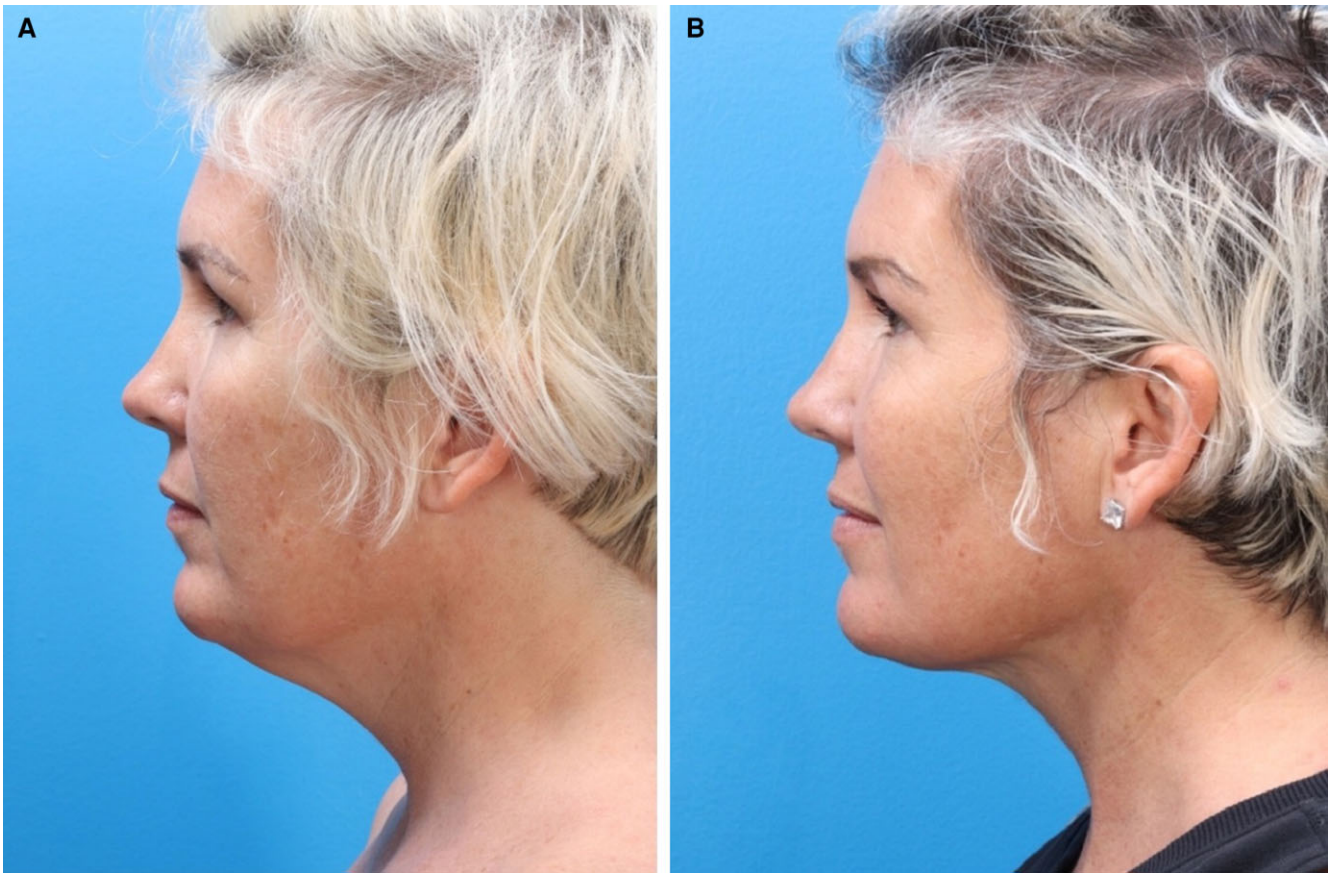


Figure 7. This 47-year-old female presented with neck laxity. She underwent light-guided percutaneous neck suspension with FaceTite (InMode; Irvine, CA). (A) Preoperative vs (B) 60-day postoperative view.

will experience residual skin laxity after the procedure. If the skin excess is mild, it can be treated with additional energy-based tightening strategies. Significant skin excess and poor skin quality necessitates skin excision (ie, rhytidectomy), and as such, is a contraindication to performing the percutaneous technique.

Addressing recurrent platysma banding remains a common problem in aesthetic neck surgery. In our study, about 5% of patients developed recurrent bands despite the use of a cervical collar in the early postoperative period. Although our study does not address whether percutaneous division of bands is successful at treating recurrent bands, we do find a low rate of recurrence at follow-up. Other invasive platysmaplasty techniques have demonstrated a 45% incidence of recurrence of platysma bands 1 year after surgery, prompting a reconsideration of the most appropriate procedure for correction of anterior bands.[12] It should be noted, however, that the median follow-up for our study is shorter than the aforementioned study, and therefore band recurrence at 1 year has not been established. Future studies are warranted to evaluate whether percutaneous division can successfully treat recurrent banding. Treatment of recurrent platysma banding may require targeting the persistent innervation of the medial platysma by the cervical branches of the facial nerve.[13]

A number of our patients had prior surgical and nonsurgical interventions in the neck. This did not appear to impact our ability to perform the procedure or the subsequent results. Therefore, prior neck treatment is generally not a contraindication to the procedure. Furthermore, in the present sample, demographics such as age, gender, BMI, and previous smoking history were not associated with complications. Importantly, most patients were female, nonsmokers, and of relatively normal weight, so we cannot draw conclusions about other populations.

The present study introduces a novel, innovative approach to rejuvenate the neck. The light-guided percutaneous suture suspension technique described here utilizes a single, continuous strand of suture that is securely anchored to the mastoid-cutaneous and platysma-auricular ligaments. This creates a low-tension dynamic support system for the platysma muscle. Moreover, the addition of light guidance is key in placing the suture along the correct subcutaneous layer and greatly reduces the learning curve for performing the operation. Although this technique can be performed as a stand-alone procedure, it is most effective

Figure 8. This 33-year-old female presented with neck laxity and an obtuse cervicomental angle. She underwent light-guided percutaneous neck suspension with FaceTite (InMode; Irvine, CA). (A) Preoperative vs (B) 5-month postoperative view.

when combined with energy-based skin tightening. Additionally, when indicated, liposuction is an important and necessary adjunct to remove excess fat prior to placement of the suture suspension.

Percutaneous suture suspension is most effective for younger patients who present with good skin quality and minimal excess skin. It is an excellent option in this cohort when patients also have identifiable platysma bands and desire a short recovery time. Importantly, it does not target facial laxity, and it is not a substitute for a facelift. Most of the improvement is observed as increased definition along the mandibular angle and the upper half of the neck, and less lifting is seen in the lower half of the neck. Although some patients may notice mild improvement in the jowl, patients bothered by jowling should be directed to more traditional facelifting techniques.

Percutaneous neck rejuvenation can be completed in approximately 30 minutes, without accounting for adjuvant therapies like suction-assisted lipectomy and radiofrequency tightening of the skin. In comparison to traditional neck lifts, which require on average 3 to 4 hours to complete, percutaneous neck rejuvenation is a more time-efficient procedure that may result in decreased costs to the patient. In addition, given the absence of external sutures, patients do not need to return to the office for suture removal and can be followed remotely.

Due to its fast recovery and the ability to be performed in a minimally invasive fashion, the procedure has been popular with a large group of patients who are only willing to pursue minimally invasive techniques or who wish to pursue neck rejuvenation at an earlier age. Patients can be stratified as (1) those not wanting any kind of incision; (2) patients who do not want general anesthesia or conscious sedation; (3) candidates for neck liposuction and energy tightening with prominent or visible platysmal bands; and, (4) patients requiring revision after traditional face or necklift, but who are not willing to repeat the surgical approach. As a result, this technique has been a major addition to our armamentarium and has significantly expanded the reach of our practice.

Table 3. Complications

	Adverse events
All events combined	71 (18.2%)
Recurrent platysmal bands	19 (4.8%)
Residual skin laxity	7 (1.8%)
Marginal mandibular neuropraxia (transient)	4 (1%)
Infection	
Resolved with oral antibiotics	1 (0.26%)
Required suture removal	3 (0.77%)
Seroma	2 (0.5%)
Hematoma	0 (0%)
Interventions for adverse events	
Performed in operating room	8 (2.0%)
Office procedure	20 (5.1%)
Medical treatment only	29 (7.4%)
Conservative treatment	10 (2.6%)

Limitations

Importantly, there are several limitations to the present data that must be taken into consideration. This was a retrospective case series that sought to discuss our experience after completing nearly 400 procedures. There was no control or comparison group, and as such, it was not designed to rigorously assess efficacy or to compare results to alternative procedures.

Although our experience has been that patients are generally happy and have durable results, the present findings are inherently limited due to the retrospective nature of the study. Additionally, we are unable to control for the heterogeneity that comes from collecting retrospective data from multiple surgeons and multiple sites. Similarly, we were unable to collect validated survey outcomes regarding patient satisfaction and long-term duration of results. However, our low incidence of revisions (7.2% or 28 patients) supports our subjective observation that patients were generally satisfied with the procedure.

The SD of follow-up times was wide, so there is also potential for sampling bias when looking retrospectively at the most recent follow-up visit. Without a prospectively implemented standardized survey, we cannot draw strong conclusions regarding patient satisfaction. Before and after pictures are presented with a wide range of postoperative periods. Early time points were provided to show early results. However, we have also included some longer-term follow-up images to demonstrate the typical longevity of the results (Supplemental Figures 1-3).

Although this study focuses on the safety and expected outcomes of percutaneous suture suspension for neck rejuvenation, it is important to note that most patients underwent concurrent energy-based tightening. Many also underwent submental liposuction. Consequently, we cannot ascertain the contribution of each individual procedure to the final result. As this technique was introduced in 2018, the exact expected duration of results is yet to be determined. A separate, prospective longitudinal study will be necessary to assess the long-term efficacy of this procedure, as well as to determine the exact contribution of the procedure to the overall result.

CONCLUSIONS

In the appropriately selected and counseled patient, light-guided percutaneous suture suspension is a safe and viable option for improving neck contour. The division of platysmal bands through a minimally invasive technique is a major advance in the treatment of these patients. In our experience, the technique works best in younger patients and when combined with energy-based skin tightening and liposuction. Importantly, this technique does not address excessive skin laxity, and as such, it is not a substitute for skin excision. However, in the appropriate patient, results have been predictable with a low risk of complications.

Supplemental Material

This article contains supplemental material located online at www.aestheticsurgeryjournal.com.

Disclosures

Dr James served as a consultant for Cynosure, LLC (Westford, MA). Dr Trovato serves as a speaker, advisor for Cynosure, LLC. Dr Pozner is a stockholder for Cynosure, LLC. Dr DiBernardo serves as a consultant, investigator, and stockholder for Cynosure, LLC. Dr Mueller is the inventor of the Myellevate system manufactured by Cynosure, LLC, as well as a consultant and shareholder in Cynosure. The Myellevate system utilizes the ICLED Surgical Suture System, which is cleared by the FDA for use in soft tissue approximation and elevation of sub dermis and underlying muscle. The remaining authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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