

Plication of Neck Strap Muscles and Platysma for Double Chin Correction - A Retrospective Study

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Abstract

Introduction: There is an increased need for recontouring chin and submental areas for esthetic reasons. Reports of such surgeries across the world are present in the literature. India too has its share of chin and neck reconstruction needs. This study was carried out to document a single-center experience of authors' approach in isolated submentoplasty. **Materials and Methods:** A retrospective analysis of case records of submentoplasty during 2012–2017 was collated. Cases fulfilling inclusion and exclusion criteria were selected for this study. A qualitative assessment of the outcomes was performed. **Results:** Sixteen cases who had undergone isolated submental lipectomy with platysma plication formed the study group. The mean age was 44.38 ± 5.49 , with a range of 37–54 years. There were 9 females and 7 males. The mean age of females was 42.89 ± 4.01 , while for males, it was 46.29 ± 6.79 years. The mean follow-up ranged for 16.2 ± 3.4 months (14–20 months). None of the patients had major complications. **Discussion and Conclusion:** The modified mini-neck lift approach for an isolated submental lipectomy and strap muscles of suprahyoid group with platysma plication is presented. Careful manipulation of the fat removal, plication of platysma, strap muscle and positioning of incision would help to a greater extent. The anatomical challenges for this variation are discussed.

Keywords: Double chin, India, isolated submentoplasty, neck lift, platysma

INTRODUCTION

Neck and esthetic contouring of the anterior lower face has gained prominence in the recent years. Commonly referred as double chin, the sagging or exemplarily large neck could be a sign and symptom of underlying conditions such as age or disease process.^[1] This elevated demand of esthetic correction of the neck is believed to be fueled by the growing importance of social media and selfies. Furthermore, awareness of these surgical procedures has generated interest among the young and old alike.^[1,2]

The expectations of these diverse backgrounds of people also vary.^[1] They are influenced by age, gender, sociocultural norms, definition of feminine, masculine, and metrosexual male features besides a host of other features such as occupational/professional needs, physical/medical requirements, education, and income.^[1,3,4] There is a trend for increased enquiry of minimally invasive procedures. The decisive factors for these types of procedures include nature of occupation, length of hospitalization, incision related, and the risk–reward benefit of undergoing the procedure. Conventionally, a full neck lift was

necessary to achieve the goals of the surgery while having a long-lasting result. As such, these procedures are increasingly perceived in the western world as an invasive procedure, especially when the surgical approach requires both submental and postauricular incisions.^[5]

The traditional full neck lift is an exhaustive procedure and does not cater to the treatment need of the younger generation. Instead, submentoplasty, an isolated facial recontouring procedure, where the dissection is limited to the submental region with no significant skin removal, is opted. The primary aim of this procedure would be to rejuvenate the submental region and balance the contour of the face by restoring the

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Received: 21-08-2020

Revised: 09-09-2020

Accepted: 14-10-2020

Published: 23-12-2020

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How to cite this article: Balaji SM, Balaji P. Plication of neck strap muscles and platysma for double chin correction - A retrospective study. *Ann Maxillofac Surg* 2020;10:417-21.

Access this article online

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DOI:
10.4103/ams.ams_355_20

submental-cervico-mental angle while avoiding large visible incisions. While planning, a surgeon relies on physical examination, diet history, concomitant morbidities such as obesity, unchecked alcoholism, and salivary gland alterations. Physical examination would include skin laxity, skin thickness, the presence of supraplatysmal and subplatysmal fat, platysmal flaccidity or banding, hyoid bone positioning, and mandibular (chin) anatomy. Psychologically, a patient should be forewarned of the limitations and realistic expectations along with potential adverse outcomes. Contraindications of the procedure include severe inelastic cervical skin, a large amount of noncompartmentalized submental fat, and severe platysmal bands. Furthermore, oral musculature may dictate terms to achieve harmonious results.^[5] Depending on the requirement, either a submental liposuction or lipectomy with or without platysma plication may be performed.^[5]

Reports of experiences of neck lift surgeries across the world are present in literature. India too has its share of chin and neck reconstruction needs. However, there is a paucity of documentation of experience of isolated submentoplasty. This study was carried out to document a single-center experience in isolated submentoplasty.

MATERIALS AND METHODS

This retrospective study included the case records of patients who sought treatment of “double chin” and ideal candidates for isolated submentoplasty at the author center were enrolled for this study. Details of all the cases that underwent procedures from January 2012 to December 2017 were considered. All basic demographic details such as age, gender, type of surgical approach, comments, complications if any, and follow-up period were collated from the case records.

Inclusion and exclusion criteria

Patients of either gender with a sagging neck and required isolated submental lipectomy with platysma plication were included in this study. The patient ≥ 18 years of age, consenting for the procedure, had follow-up for at least 2 years were only considered and if required, they were contacted again for clinical examination. The presence of standard photographic images in the records was a must to be included in this retrospective study. Pre, immediate, and posttreatment images (at the end of 1 year) were reviewed by authors. Patients who were extremely obese, those who abused alcohol, those who exhibited salivary gland (sublingual/submandibular) alterations, and cases of sleep apnea due to micrognathia and short neck were excluded from the study. Those patients with severe inelastic cervical skin were also not included in the study. Similarly, pregnant women and those who had uncontrolled diabetics or metabolic syndrome were excluded from the study. All data were collated and descriptive statistics were provided.

For qualitatively assessing the outcome, two questions were asked routinely at baseline and at follow-up of immediate postoperative, 6, and 12 months.

1. Self-Reported Submental Fat Rating (SRSFR): Patients were asked, “How much fat do you have under your chin right now?” The choices were on a five-point Likert scale with 0 – no chin fat, 1 – a slight amount of chin fat, 2 – a moderate amount of chin fat, 3 – large amount of chin fat, and 4 – very large amount of chin fat. For this question, a reduction in score was considered successful
2. Self-Rating Scale (SRS) – Patients were posed the question: “considering your appearance in association with your face and chin, how satisfied do you feel with your appearance at the present time?” using a five-point Likert scale: 1 – very dissatisfied, 2 – slightly dissatisfied, 3 – neutral, 4 – satisfied, and 5 – very satisfied. An increase in score was considered successful.

Surgery

The surgery is performed under general anesthesia with standard preparation. After scrubbing, the surgical outlines are made with marking pen [Figures 1 and 2]. The procedure is carried out as below:^[1,5,6]

- A single 3–4-cm incision is made along the submental crease in a transverse direction such that incision is placed in the hidden, concave surface of the neck and falls within the neck’s natural shadow for camouflage of the scar
- Length of incision depends on the extent of the fat removal and plication needed
- The lateral extent has to be planned as per requirement. The dissection plane could extend till sternocleidomastoid muscle to the jawline to the base of the neck. This incision allows full access for complete dissection of these areas, depending on the preoperative evaluation
- Depending on need, a scissor (for wide reach) or blunt (small area) dissection is carried along the subcutaneous plane. This will facilitate the separation of the platysma muscle from the subcutaneous fat layer
- This dissection may be needed to extend till thyroid cartilage and the submandibular triangle.
- Excessive fat compartments in between the medial platysmal bands shall be removed, ensuring a dry field
- If to involve a subplatysmal area, the marginal mandibular nerve and anterior jugular veins should be carefully identified and not disturbed
- The fat sculpting should be smooth such that a natural transition is achieved
- The medial edges of the platysma are identified when submental fat is being removed
- Medial edges are plicated with 2.0 vicryl suture to create a muscular sling. The edges are then re-approximated
- Any excess fat present in the area is excised or trimmed. If required, around drain is used and is sewn into place
- The submental and other incisions, if any, were closed with 6–0 fast-absorbing gut along the skin edges in a simple continuous fashion. The postoperative instructions were given. Prescription of pain medication – nonsteroidal anti-inflammatory drugs and appropriate antibiotics were provided with. The use of silicone scar cream, 2 weeks



Figure 1: (a and b) Preoperative photographs, (c-f) Intraoperative photographs, (g and h) Postoperative photographs

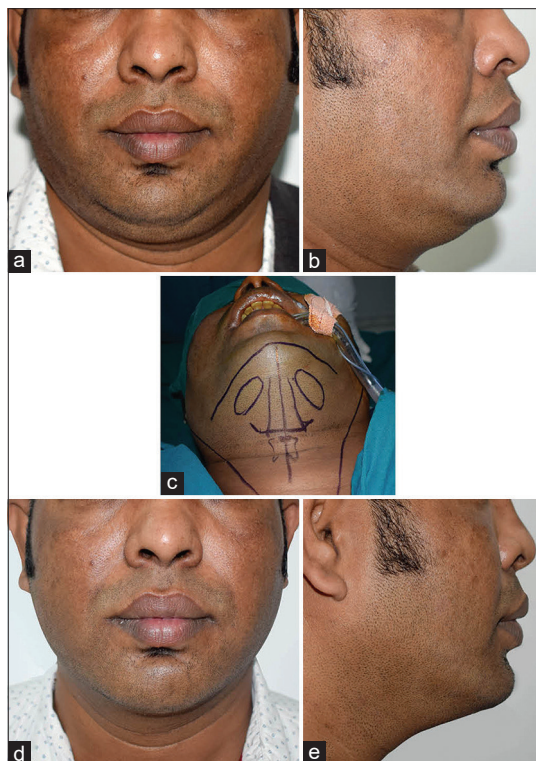


Figure 2: (a and b) Preoperative photographs, (c) Surgical outlines are made with marking pen, (d and e) Postoperative photographs

after procedure at incision site, was advised, as and when required

- The patient was seen again on postoperative day 1, and if possible, drain, if placed, was removed

- The patient returns for a checkup and postoperative photographs at 2 weeks and again at a monthly interval.

RESULTS

In all, there were 31 cases of submentoplasty, of which 16 cases fulfilled the criteria and underwent isolated submental lipectomy with platysma plication. The mean age was 44.38 ± 5.49 , with a range of 37–54 years [Table 1]. There were nine females and seven males. The mean age of females was 42.89 ± 4.01 , while for males, it was 46.29 ± 6.79 years. The mean follow-up ranged for 16.2 ± 3.4 months (14–20 months).

None of the patients had major complications. There was no major complication, and there was only one instance of hematoma. No major vessels were involved, and it was a generalized ooze that required no additional incisions or drain. All patients had a complete recovery.

The mean SRSFR at baseline was 3.56 ± 0.51 that changed to 0.44 ± 0.63 immediately after the surgery. At the end of 6 months, it was 0.38 ± 0.72 , and at a year, it was 0.44 ± 0.73 . Similarly, the SRS at baseline was 1.38 ± 0.5 that increased to 3.63 ± 0.5 at immediate postoperative period and at the 6th and 12th months remained at 3.81 ± 0.4 . The difference between the baseline and 1-year period for both SRSFR and SRS was significant ($P \leq 0.05$).

Qualitative assessment of the records indicates that those with anatomically diffuse fat were tougher to treat and had a relatively higher SRSFR score than those with compartmentalized fat, even at the end of 1 year. The SRS score of the same patient was persistently reduced than those with compartmentalized

Table 1: Demographic parameters of the study population

Characteristics	Value
Total number of patients	17
Age (years)	
Mean±SD	44.38±5.49
Range	37–54
Sex	
Females	9
Males	7
Major complications	0
Minor complication hematoma	1

SD=Standard deviation

one. Similarly, it was relatively tougher to treat patients who had moderate or higher obesity and or basal metabolic rate and more importantly abdominal girth.

DISCUSSION

The present procedure is a modification of the mini-neck lift, a conservative procedure, described by Knize.^[6] This procedure requires a submental incision, just behind the chin, to remove submental fat. Corset platysmaplasty may be added to this surgical approach. In the present study, all cases had different levels of platysmaplasty, depending on the requirement. However, in practice, the posterior the submental incision, the better the access to the neck. However, the place of incision should be decided after careful consideration of local surgical anatomy, particularly the nerves and blood vessels. Deeper undermining of skin and redraping should be attempted carefully.^[1] The fine balance is needed.

With this technique, the compartmental fat would be easy to remove. The submental fat anatomy has a role to play. The submental fat layer is not a continuous layer but is actually compartmentalized and borders formed by fascial septa. Each septum travels from the deep fascia or periosteum to insert into the dermis. This fat layer is better described to be a discrete areolar chamber within the preplatysmal fat. Superficially, this fat compartment is limited by the dermis and platysma. The submental crease inside the fat is reflected as the submental septum, which creates the anterior/mesial border and extending till the hyoid septum, which forms the distal or posterior border. It is also bordered laterally by the digastric septa. Balanced morphology of this fat compartment contributes to the esthetics of the neck.^[7,8] In neck rejuvenation procedures, recreating the normal anatomy is crucial. Using ultrasound to assess the compartments may be useful.^[9]

Placement of incision is another challenge. It is dictated by the method of the surgery used. The surgery could range from Saylan's S-lift, purse-string facelift, minimal access cranial suspension lift, Brandy's modification of S-lift, short-scar purse-string facelift, anterior cervicoplasty to single incision minimally invasive neck lift.^[1,10,11] For isolated neck, rejuvenation procedure is reported to be the best.^[12]

Scar management is another issue in the present technique used. Moving the submental incision as posterior as possible, balancing the fat compartment and platysma manipulation is the key for success. Although submental incisions are better hidden, moving it posteriorly and appropriate redraping after platysmoplasty would be beneficial. For this to achieve, the use of Pythagoras' theorem to estimate the excess skin and fat removal could be used.^[1] In lateral profile photographs, to estimate the amount of skin redraping, a simple basic Pythagorean theorem can be used. The skin can be considered as a hypotenuse of a right-angle triangle. The remaining two sides – the vertical and horizontal dimensions of the skin – can be considered as the other canti. The junction of the horizontal and vertical arms is right angle. Based on the traditional basic Pythagorean theorem, the square of the two catheti is equal to the square of the hypotenuse. As per this approach, if the sagging skin length is equal to or less than the hypotenuse of the imaginary triangle, then the skin can be accommodated within the natural contours of the neck. The use of this theorem to determine the extent of incision placement can be read elsewhere in detail.^[1] Understanding of locoregional anatomy, application, and correlation of Pythagorean theorem to the placement of the incision within the cervicomental angle and wide undermining of the neck skin allows the better neck lift to be widely used for many types of neck lift patients. At the same time, excessive plication of platysma may lead to platysma bands. Knowing the local anatomy, particularly of the facial vessels in the region, would help to avoid surgical misadventures.^[13-15]

Obesity is a known and recognized risk factor for failure of submentoplasty.^[13] Although the initial results are often good, with the fat deposition in progress, at a later date, the fat deposition could continue affecting the surgery results. This is recognized with the two questions posed to the patients. Our results are in reflection with similar studies in the Western world.^[16]

CONCLUSION

South Indian center's experience of surgical correction of double chin with submentoplasty with platysma plication has been reported. The use of standard Pythagorean theorem to determine the extent of skin removal, placement of the incision within the cervicomental angle, and undermining of the neck skin will help to plan neck lift more accurately. The need for preoperative study and photographs, surgical planning, and performing the procedure correctly are the need of the hour. Careful manipulation of the fat removal, plication of platysma, strap muscle and positioning of incision would help to a greater extent. Large-scale studies are needed to identify the success in using the modification of the traditional approach, as mentioned in this study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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