

## ARTICLE



# Evaluation of using double Teostrut graft to control nasal tip projection

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### Abstract

**Background:** One of the key components of nasal tipplasty is effective control of nasal tip projection. Several cartilage grafts have been used for this purpose each with its own advantage and disadvantage.

**Aim:** To evaluate the use of double Teostrut graft for controlling tip projection.

**Patients and Methods:** A total number of 170 patients were subjected to primary and secondary rhinoplasty between January 2020 to January 2023. Those patients had double Teostrut banner graft for support of their nasal tip and maintaining tip projection after operation.

**Results:** The follow-up period was ranging between 6-12 months. The shape of the nose was evaluated by patients' visual analogue scale. The average score for patients' satisfaction was 8.2 out of 10 points which indicated a high satisfaction rate.

**Conclusion:** Our current approach using double Teostrut graft showed to be effective and predicted in maintaining tip projection after operation using double Teostrut graft avoids potential complications that might be associated with single Teostrut graft, namely rotation and distraction of graft which may lead to drooping and lateralization of the nasal tip.

## 1 | INTRODUCTION

One of the most challenging aspects in rhinoplasty is nasal tip plasty, since it requires a great deal of care and experience from the surgeon. The critical steps for successful tip shaping are maintenance of the projected well-defined nasal tip. One of the most common complaints that may necessitate revision rhinoplasty are excessive tip bulbosity and abnormal tip projection

and rotation (1,2,3).

Many methods have been utilized to provide adequate tip projection after open rhinoplasty including columellar strut graft, tongue-in-groove and septal extension graft, to name a few (4). One of the recently advocated procedures to maintain tip projection is using partial septal extension graft or

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Supplementary information The online version of this article contains supplementary material, which is available to authorized users. Dr. Muhammed Naeem Abdullah, 2024; Published by MEERP, Inc. This Open Access article is distributed under the terms of the Creative Commons License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

effectiveness in maintaining of tip projection after rhinoplasty(5). In this study we evaluate using of double Teostrut graft in tip plasty.

## 2 | PATIENTS AND METHODS

From January 2020 to January 2023, we have applied double ANSA banner graft in 170 patients who were subjected to primary and secondary rhinoplasties.

Preoperative analysis of nasal skin thickness, nasal tip projection and any nasal airway obstruction. All patients had preoperative CT/SCAN and routine preoperative investigations. All patients had preoperative informed current.

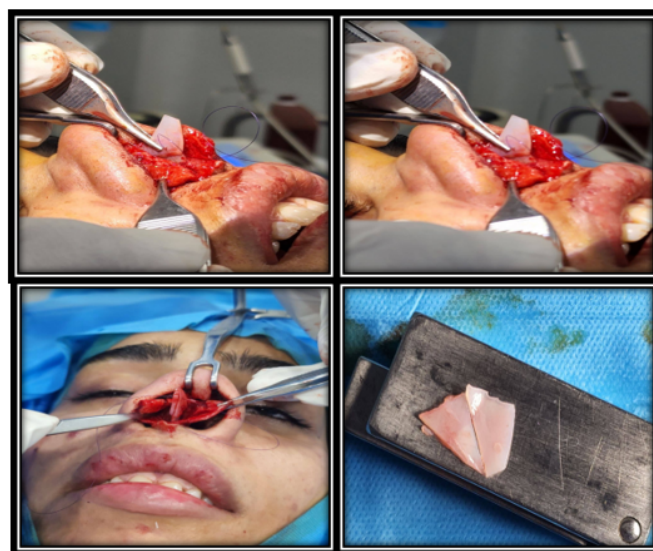
### Operative technique:

All operations were done under local anesthesia with sedation. The anesthetic solution consists of 2% of lidocaine with 1:200000 epinephrine. A total 5-10 µl of solution was infiltrated in infraorbital foramen (through buccal approach), dorsal skin, nasal floor and septum. Open approach was used in all of our patients. Nasal tip was occurred through inverted V-shaped. Transcolumellar incision and bilateral marginal incision. The dissection is proceed cephalically below the superficial musculaponeurotic system(SMAS). Dehumbing, medial osteotomy, lateral osteotomy and septal cartilage graft harvesting, all these steps are done before tip plasty.

After exposure of both lower lateral cartilage, a conservative excision of cephalic portion of lower lateral cartilage then done. The ANSA banner graft or teostrut graft is fashioned from septal cartilage in triangle shape that approximately 2mm at tip and down word reach to 8mm in width and length 25mm. Two ANSA banner graft are sutured together to left and right side of the septum after assessing the ideal angle of tipasshow in figer 1 below. The angle is choosing is between 70-90 along the perpendicular line to anterior septal border in the sagittal plane. After choosing the ideal angle, both graft are fixed to its position using 27 guge needle then fixed by 510 pds in mattress fashion. Flaning the two ANSA banner graft are

stabilized in septum, then it anchors to new tip by performing interdonal sutue that include the two ANSA banner graft using 610 prlene suture. An additional suture (figure of eight) is passed including both domes for further stabilization. After final check , the ptcess two ANSA banner graft are trimmed.

When both domes are in ideal position, we now address medial crura and columellar . Almost constantly, we used columellar strut graft that fixed to the medial crura using 610 prolene sutue. We leare gap between anterior aspect of two ANSA banner grafts and colummullar strut to permit free columellar movement. After finishing the above mentioned steps, the dorsal flap is redrap and incision is closed. Alar base excision was done if it indicated. Internal nasal pack was inverted and external taping was done with applying nasal splint. Patents discharge as same say and internal nasal packing was removed in next day. The external nasal splint it removed at 10-14 day after operation. All patients instructed to keep nasal taping for 2 months and external massage. All patients were followed for 6-12 month after operation.



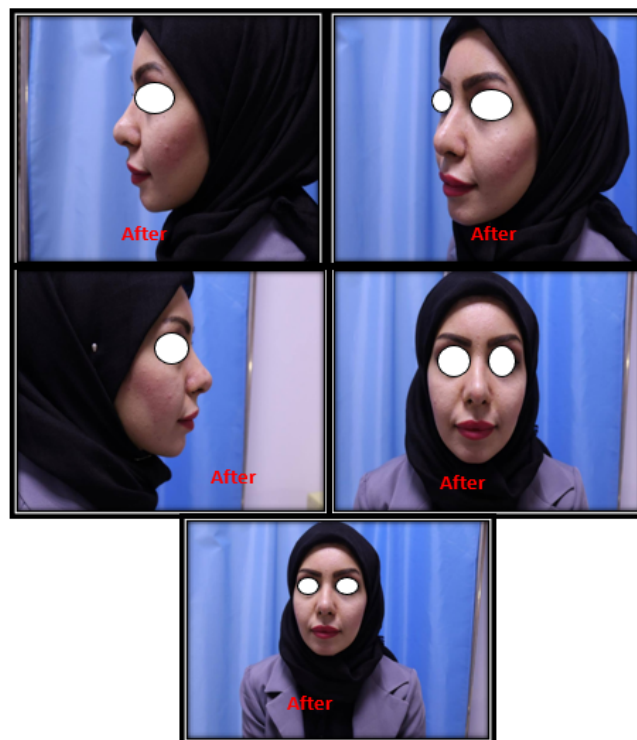
**Figure1:** The ANSA banner graft or teostrut graft is fashioned from septal cartilage in triangle shape that approximately 2mm at tip and down word reach to 8mm in width and length 25mm. Two ANSA banner graft are sutured together to left and right side of the septum after assessing the ideal angle of tip.

# Evaluation of using double Teostrut graft to control naral tip projection

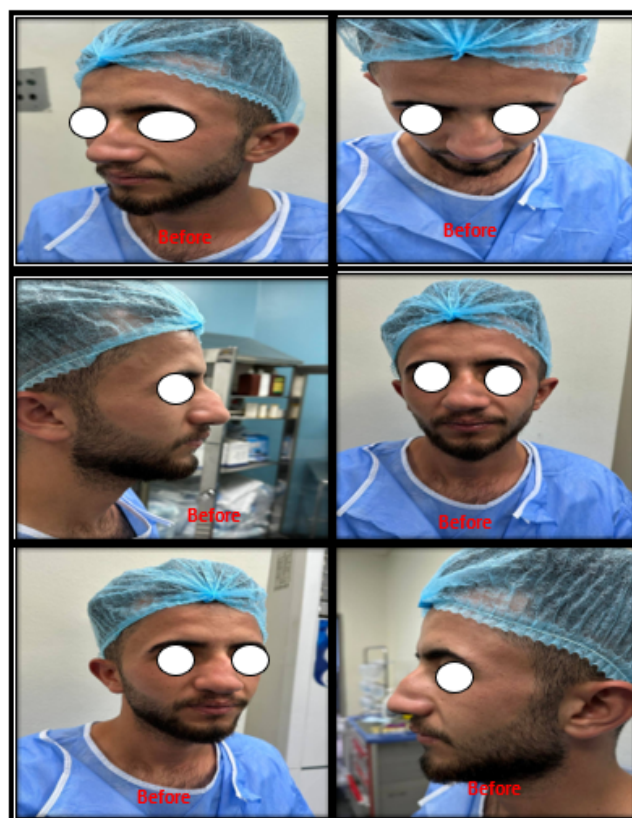
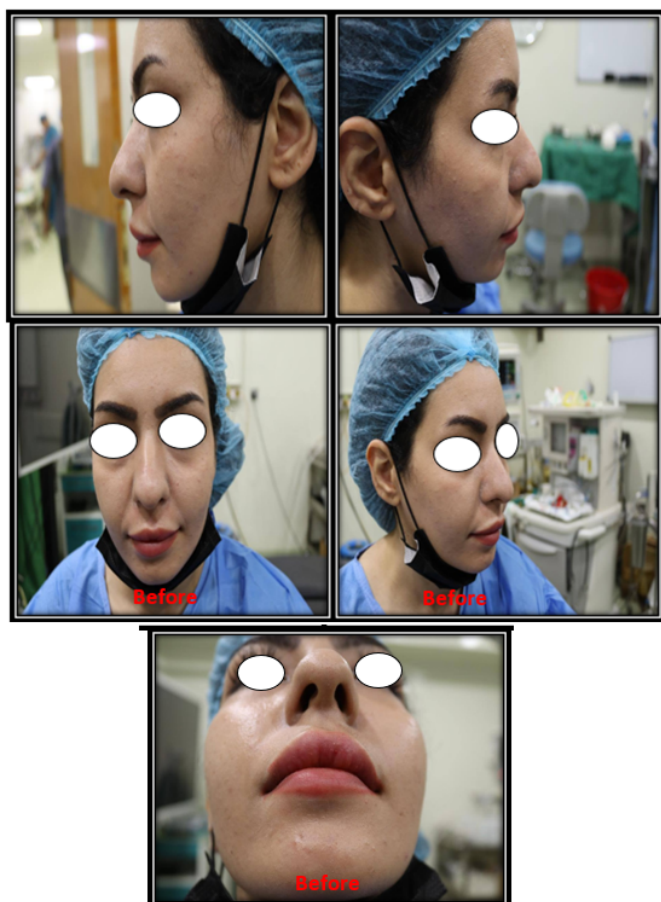
## 3 | RESULTS

The double ANSA banner grafts (Teostrut grafts) was applied on 170 patients (154 female versus 16 male) with age ranging from 18-45 years. The procedure were applied in both primary rhinoplasty (150 cases) and secondary rhinoplasty (20 cases). The follow-up period ranged from 6 to 12 months. The shape of nose was evaluated by patient during follow-up period with VAS(0=totally unsatisfied, 1,0=totally satisfied).The average score for patients satisfaction was 8.2 out of 1,0 points which indicated reasonable high satisfaction. All of our patients had rept adequate nasal tip support during period of follow-up.

None of our patients developed major complication e.g infection, skin necrosis, sadly, or injury to surrounding structure. There was no cases of cartilage graft extrusion or infection. none of our patient had compliant regarding nasal stiffness or altered tip sensation.

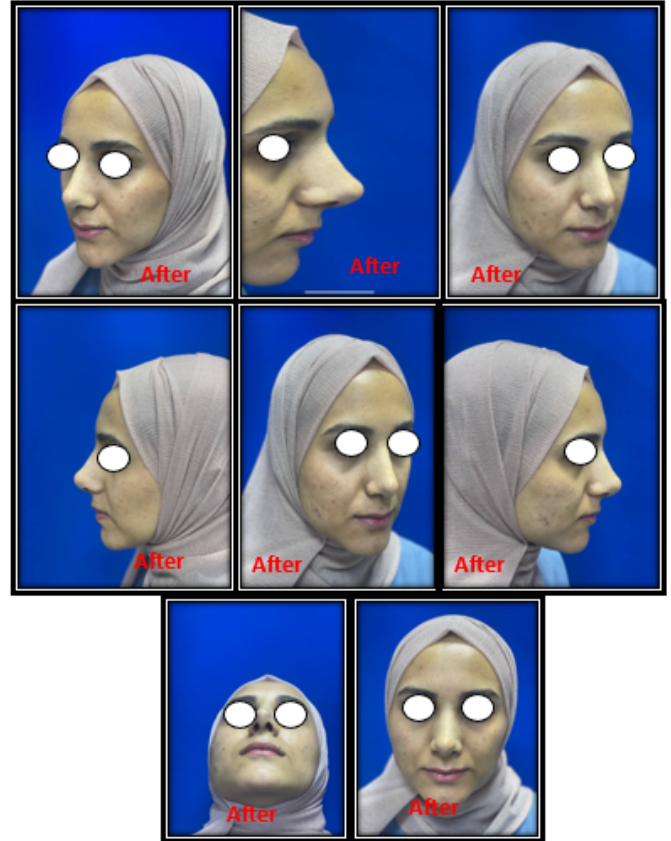


*Case no 1: The first case is for a 32-year-old patient. She underwent rhinoplasty using the Teostrut method. The results are clear before and after the operation.*





**Case no 2:** A young patient aged 28 years who suffers from a deviated nasal septum, the severe type, with symptoms of shortness of breath, and the tip of the nose is visible as an external cat. He underwent rhinoplasty using the teostut method, with restoration of the nasal septum. The results are clear before and after the operation



**Case no 3 :** pre and postoperative pictures and the result after 6 months followuo



## Evaluation of using double Teostrut graft to control naral tip projection



*Case no 4: pre and postoperative pictures with sever septal deviation and the result after 6 months follow-up*



*Case no 5: pre and postoperative pictures and the result after 6 months followuo*



*Case no 6 : pre and postoperative pictures and the result after 6 months followuo*



*Case no 7: pre and postoperative pictures and the result after 6 months followuo*

## 4 | DISCUSSION

The key of successful tip plasty is to achieve solid support of nasal tip that maintain adequate tip projection .Nasal tip might loss its projection after rhinoplasty which had major drawback effect on immediate achieve plearing tip projection. Nasal tip stabilization can be achieved by primary their options. Folumellar strut, tonque –in-groove, and septal extension graft.The consistent loss of tip support and projection after operation can be due

to healing process as well as due to surgical technique for example when the the initial integrity of implanted graft is weakened, this leads to tip drooping to its original height before the operation (6,7,8,9).

Columellar strut graft has been associated with failure to maintain tip projection, rotation and shape of nasal tip. Although columellar struts were used to increase tip projection, however; recent literature suggested that columellar strut graft unable to achieve increase tip projection and should unify nasal tip and maintain its position. Byrd et al. introduced the concept of septal extension graft as a method for controlling tip projection. Different variations of shape and point of fixation of septal extension graft have been introduced ending on specific characteristics of underlying tip structures (10). However, one of the problems associated with septal extension graft it can lead to hard and fixed and unnatural tip appearance (11). One variation of septal extension graft is what is called partial septal extension graft or anterior septal angle (ANSA) banner or also called Teostrut graft (12). This small strip of cartilage that is usually harvested from septal and anchored to septum and extends superiorly up to nasal tip to correct nasal tip projection and also support the nasal tip structurally. The most important step before applying this graft any deformities or termination of caudal septum should be corrected, otherwise there is a rise of caudal septum (13,14). Authors claim that applying single ANSA graft in same axis of lateral curvilinear cartilage will create a moment of force of rotation, i.e. there is no rotational force and no further over rotation of lower curvilinear cartilage (5). However, we believed that putting of only single graft as ANSA graft had more subjected to distraction force. Presence of single thin graft that is applied below the dome of lower lateral cartilage makes it liable to bending especially when it is insecurely fixed to the septum which ultimately leads to loss of tip projection and support on the long term follow-up. Septal cartilage graft which is used for ANSA graft is thin and weak and applying of single one gives no secure support also unilateral ANSA graft may result in lateralization of nasal tip (15). For this reason we apply two ANSA grafts to give more support and avoid tensioned force from both dome to rotate the ANSA graft. This was observed clinically during follow-up of our patients, where all of our patients had maintained projected tip and this was not seen when we used single ANSA graft in our early work, where

most of our patients lost their tip projection on the long follow-up which pushed us to use double ANSA graft with satisfactory outcome.

The main concern about using double ANSA graft was the rise of possibility of increase tip width. This was not seen in our patients, since the cartilages which were used were meticulously carried to remove any irregularities and were thinned enough to be 2 mm in thickness. Also, most of our patients had thick skin envelope which is also a common place for the underlying double ANSA graft.

## 5 | CONCLUSION AND RECOMMENDATION

Nasal tip projection and support appear to decrease from immediate postoperative position. Using of double ANSA graft seen to give better tip projection and support of nasal tip than single ANSA graft since it gives better and adequate support with no risk of rotational movement that could occur with using of single ANSA graft.

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