

Tongue-in-Groove technique for Reconstruction of Nasal Tip Ptosis due to Rhinoplasty, A Cross-Sectional Study

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Abstract

Background: nasal tip ptosis is believed to be one of the most common nasal malformations with a relatively high prevalence in patients who underwent rhinoplasty operation. A variety of techniques has been defined for the surgical modification of tip ptosis. The TIG technique seems to be a multipurpose surgical approach for the modification of nose in the lower third region. TIG could be appropriate in the primary and most modified cases and to show better results, it has been integrated with other surgical systems.

Aim: The aim of this study is to investigate TIG technique in patients with nasal tip ptosis after Rhinoplasty, referring to Loghman-E- Hakim hospital, Tehran, Iran.

Methods: In following descriptive cross-sectional study, surgical operation was carried out in thirty-three patients suffering from nasal tip ptosis between 2012 and 2013 using the described technique. The data were gathered in a questionnaire designed for this purpose. At the end, the degree of nasal ptosis was determined in these patients.

Results: In this study, nasal shape was desirable in 75.7% of patients and there was no case of nasal ptosis. 82.8% of the patients were satisfied with the results. 81.1% of patients have not any complications. Other factors did not associate with nasal ptosis ($P > 0.05$).

Conclusion: based on the results of this study and their comparison with other studies conducted in this field, TIG method after rhinoplasty can reduce nasal ptosis. Thus, it can be deduced they will be proper in the both primary and most revision cases.

Conflicts of Interest: The Authors declare no conflicts of interest.

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Introduction

Over the past few decades, rhinoplasty has been increased and subsequent complications have increased, there are numerous techniques to deal with these complications and different surgeons use various approaches for this correction. Tip ptosis known as a prevalent nasal abnormality with a high percentage of 72% in rhinoplasty patients, it is the principal feature of nasal aging, often observed following nasal trauma, which the nasal tip is

reformed and inferiorly rotated, which result in an elongate nose length with reduction of the nose angle called nasolabial. (1, 2) Such abnormalities presumably result from an abnormal cartilage into the nose with deformity in lateral and medial crural that cause long lateral crura with increasing in anterior septal part of angle and coarse skin surface of the lateral lobules (6). The final intention of any technique in order to modify of the droopy tip nose is to improve the alar

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cartilages and also to keep their new position fixed which supposed to be achieved directly by alar cartilages corrections and/or adjusted structures associated with the alar cartilages (2, 3).

In order to improve the droopy tip, ample numbers of techniques have been suggested for the surgical processes such as the lateral crural steel, the lateral crural overlay, the tongue-in groove technique and so on. (2-5). The mentioned techniques have the ability to modify the alar cartilages directly that due to the extensive exposure of external rhinoplasty approaches with a potent additional loss of tip projection involving a usual utilization of columellar struts. This modification occurred by medial encroachment of the lateral crura, transection and overlay of the lateral crura or improvement of the medial crura on to the caudal septum (6).

The tongue-in-groove (TIG) technique is a multipurpose surgical procedure for the correction of lower third area of the nose, used in combination with other surgical methods. The technique can provide a predictable and adjustable degree of nasal tip rotation, tip position, to correct columellar show, projection and tip ptosis because of the pull of depressor septi nasi muscle (7). Also this method to avoid cartilage excisions when used with septoplasty or columellar techniques, will correct of caudal septal deviation. This procedure used to prevent the tip drop after rhinoplasty that is frequently (3, 7). In this report, we would evaluate TIG for patients with tip ptosis after rhinoplasty that is desirable in the primary and most revision subjects which can be easily merged with other surgical approaches.

Etiology

The tripod theory of nasal tip support which has its own major and minor mechanisms should be taken into consideration in the nasal tip ptosis. The major tip support mechanisms: If we consider, the inferior lateral cartilages of

the nose are in triangular in the shape, one of the supporting legs is the lateral crura and another one is the medial crura, and the unity of the medial and lateral crura, the connection of the medial crural bases to the caudal terminal of the quadrangular cartilage and of the caudal end of the superior lateral cartilage to the cephalic margins of the lateral crura are considered as the major tip fixed structures.

There are five parts involving in the minor tip support mechanisms such as First, the dorsal cartilaginous septum Second the interdomal ligaments Third, the nasal spine Fourth, the membranous septum And finally, the alar connections to the epidermis. Alteration in major and minor support mechanism also in the size, shape, and integrity of limbs of the tripod lead to an intensive change in the tip circulation. In some situations if medial crural unity become compromised which is regarded as the most common factor in tip ptosis secondary to trauma, the nasal tip would tend to rotate inferiorly which can cause the development of supporting limb of the tripod buckles under the weight of the overlying skin-soft tissue. Additionally, tip ptosis occurred when we have loss of connection of the lateral crura with the top lateral cartilage. Trauma of lower lateral cartilage during rhinoplasty, senile ptosis of the nose and excessive length of the lateral crura can result in collapse in the inferior part of the nasal tip which has been considered as the major tip support mechanisms (8).

Briefly, nasal ptosis regularly results from an incongruity between the tip support and the gravity on the overlying skin soft-tissue envelope.

Methods

Subjects (Cases) Thirty-three patients with ptosis of the nasal apex were operated between 2012 and 2013 in Alpha and Sohrevardi surgical centers in Tehran, using the noted technique before. Assessments of preoperative stage including, various nasal tests and

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standardised scanning in order to measure the nasal tip ptosis rates, projection and the nasolabial angle which supposed to be less than 90-95° in men and less than 100-105° in women as well. Entry criteria included in this study including: age over 18 years and Deformity in the lower part of the nose tip (1/3 lower), exit criteria: Age under 18 years. Less than 1 year post operation of nasal tip ptosis, we re-evaluated the examinations by questionnaire and compared them with the preoperative features such as values and views.

Surgical Technique

Before surgery, we should check the nose of a series of features, including the tip projection, rotation, presence of alar retraction and septum deviation and etc. (the nasolabial angle is clarified as an angle between the line passed through the middle point of nostril aperture and a line that has passed vertically to the Frankfort horizontal region while intersecting subnasale, this range is usual 90 to 120 degrees and in all patient was measured. All patients were under complete anesthesia and also local infiltration anesthesia was injected for the nasal septum and pyramid.

This procedure started with a hemitransfixional incision on the caudal septum and bilaterally, elevating the mucoperichondrium flaps and then nose was opened in the form of inverted V incision on mid -columellar. The nasal skin soft tissue was slowly pulled up from both lower and upper lateral cartilage and bone. Nasal space was exposed and the space between medial crura was separated and medial crura pushed and grasped with Adson Brown Forceps. For the assessment of tip rotation and projection a 27-G needle was located via the left medial crura, caudal septum and right medial crura and carefully examined the nose tip in terms of symmetry and rotation. To prevent nasal tip ptosis ,finally we selected 4-0 suture, a columellar-septal mattress suture of 4-0 chromic gut is crossed transcutaneously in order

to keep the caudal septal margin and medial crura in their positions. This maneuver was named tongue-in-groove technique, it is believed to have the ability to provide a midline fixation technique and contribute to make caudal septal trimming less necessary (specified by the interposition of caudal septal nose between the feet of the medial crura). If the posterior part of the septum is considerably gnarled, contributing to a hanging columellar shape or if its deviation is extreme, it can be trimmed or completely cut. On the other hand, if it is removed or trimmed remarkably, it is mandatory to be replaced by a septal reconstruction graft that can be fashioned from the patient's own septal cartilage or other cartilage graft. When the procedure was completed, the skin soft tissue placed in appropriate position and the appearance of nose rechecked again. The dressing of nose was performed some tapes for supporting the apex of nose and a nasal cast that will be removed later.

Results

In this study which was performed during one year, the average age of cases was 31.2 with a standard deviation of 4.7 years. Which 13 cases (39/4%) were men and 20 cases (60.6%) were women (Figure 1).

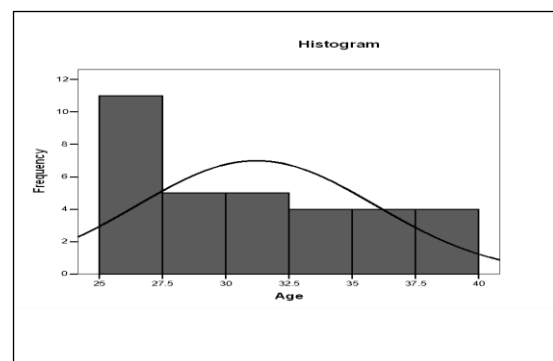


Figure 1. Study age distribution among patients.

According to the frequency, women were more than men. Gender and age have no effect on the results of treatment ($p > 0.05$). 12 cases (36.4%) have history of previous rhinoplasty

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and 21 cases (63.6%) have no history of previous rhinoplasty that has no effect on the results of treatment ($P > 0.05$). Frequency distribution of nasal tip ptosis according to physician's opinion in patients under study divided to three group: excellent:4 cases (12.1%), good:21cases (63.6) and relatively good:8 cases (24.4%) totally the shape of the nose was good and excellent in 75.7% of patients and there was no case of nasal tip ptosis (Table3). 24 cases (82.8%) were satisfied with the results (Table 4).27 cases (81.1%) have not any complications and 6 cases (18.2%) have breathing problems and adhesive intranasal (Table5).

Discussion

TIG is a well-known method to supply high percentage of success and its ability to predict, empirically contributed to several properties, medial crural relocation, immediate visual feedback (which give the opportunity for perioperative fine-tuning of nasal tip dimensions) after achieved results, approximate a three-layer cartilage structure that cause fixation, durability and support to the nasal base (3,9,10). This method is introduced by Kridel et al, in which the medial crura overlap with the nasal septum and then it is proven (9). This method is appropriate to hanging columella, nose length, and nasal tip ptosis. TIG can increase the length of the upper lips and reduce the length of the nose. In our study, nasal character was desirable in 75.7% of patients and there was no case of nasal ptosis. 82.8% of the patients were satisfied with the results. 18.2% of patients had complications including breathing problems and adhesive intranasal; other factors did not associate with nasal ptosis ($p > 0.05$). Cingi and Songu in Turkey studied, 96 people who had undergone TIG suture had been shown to mitigate the stiffness of the nasal apex, after one year, the most patients (96 %) were satisfied with symmetry and spinning of the nasal tip (11), which in our study was

about 63%. Hossam and colleagues in Egypt studied on 500 people (12), it has been perceived that the TIG technique is used to accurate the tip ptosis and causes the nasal tip to rotate without deformity it, this study is line with our study, this method showed good efficiency as professed in our study. In a report by Kridel and colleagues (13) in the United States on 287 people, 97% of patients were satisfied and TIG was a direct and effective solution for reducing the nose length and making a suitable tip rotation and projection, and when combined with septorhinoplasty, it can correct the deviation of the caudal septum well. In our study, this method was also approved, but in general, 76% of patients had appropriate and admirable results. Constantian et al reported cases with incorrectly positioned lateral crura (78% and 61%, respectively) than in those with orthotopic lateral crura (57% and 20%, respectively) have inadequate tip projection and convex lateral crura (14). In Caucasian patients with downward nose, the hypoprojecting tip which is correlated to arched, convex nostrils made up fewer rates of subjects, while Goode's Ratio illustrated mostly overprojecting tips. In Asian patients, in a study that reported by Park, recently has demonstrated four associated factors contributing to TIG, correction of alar cartilage (shape and orientation) or nasal septal cartilage, he advised re-shaping/re-orienting of the inferior lateral cartilages by cephalic resection and stitching. Moreover, for straighten of the nostril profile and pull the tip lift upwards, the modification of lower part of the septum in terms of their length and shape must be achieved (15). Patients with the accurate ptosis of the nasal head due to having excessive nasal length will benefit from septum antero-inferior shortening by cartilage and membranous septum displacement, on the other side, patients with over-projection of apex presumably require lateral crura shortening if they seem too much long. It is noteworthy that excessive shortening

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definitely should be avoided to skip tip de-projection (9). The TIG technique is a useful surgical procedure that let surgeon to perform nasal tip, columellar, and caudal septal properly corrected changes and result in unwanted counter-rotation postoperatively. The TIG method probably becomes a beneficial principal way for tip rotation using permanent or semi-permanent sutures for the fixation in those with sufficient tip support. TIG maneuver that has been used to secure the medial crura to the septum that's why many surgeons encouraged to use the permanent or semi-permanent sutures in order to embed the medial crura to the septum and also for the persistent tip rotation and stronger tip support. special subjects that have severe tip ptosis may need to an amalgam of tip rotation processes, such as the lateral crural overlay or lateral crural steal, in addition to the TIG technique (3,9,10,16). Basic indications for TIG are reduction rhinoplasty that recently is common, correction of unnecessary columellar, short nose or revision for durable and fixed septal expansion, stabilization and inhibition of an accurate anterior septal deviation, correction of the counter rotated tip. Since TIG, as a recommended technique, is readily combined with other methods such as rhinoplasty maneuvers, the indication of spectrum presumably can be greater (16, 17).

Conclusion

The TIG technique is an acceptable method for achieving predictable tip ptosis, rotation, projection and provides a straight, effective solution to columellar show. It maintains the correction of a deviated caudal septum, when used in combination with septoplasty techniques.

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Conflicts of Interest

The authors declare no conflicts of interest.

Ethics:

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References

1. Foda HMT. Management of the droopy tip: a comparison of three alar cartilage modifying techniques. *Plast Reconstr Surg* 2003; 112:1408e17.
2. Alexander M, Marcos H. Management of severe tip ptosis in closed rhinoplasty: the horizontal columellar strut. *Plastic, Reconstructive & Aesthetic Surgery* 2007; 60: 400e406.
3. Russell W, Kridel H, Scott BA, Hossam M, Foda T. The Tongue-in-Groove Technique in Septorhinoplasty. *Arch Facial Plast Surg* 1999; 1:246-56.
4. Kridel RWH, Konior RJ, Shumrick KA, et al. Advances in nasal tip surgery: the lateral crural steal. *Arch Otolaryngol Head Neck Surg* 1989; 115:1206e12.
5. Konior RJ, Kridel RWH. Lateral crural techniques for repositioning of the nasal tip. *Oper Techn Otolaryngol Head Neck Surg* 1990; 1:158.
6. Sajjadian A, Guyuron B. An Algorithm for Treatment of the Drooping Nose. *Aesthetic Surg J* 2009; 29:199-208.
7. Simons RL. Nasal tip projection, ptosis, and supra tip thickening. *ENT* .1982;61:452-455.
8. Dorina M, Daniel O, Shruti K, Zorin C, Florian B. surgical solutions to nasal tip ptosis. *Acta Medica Transilvanica* 2013;2(1):207-9.
9. Giacomini PG, Rubino S, Mocella S, Pascali M, Digirolamo S. Approach to the correction of drooping tip: common problems and solutions. *Acta Otorhinolaryngol Ital* 2017; 37:295-302.
10. Russell W, Kridel H, Delaney SW. Commentary on: Effects of the Tongue-in-Groove Maneuver on Nasal Tip Rotation. *Aesthetic Surgery Journal* 2018, 1-4.
11. Cingi C, Songu M. Triple cartilage combining suture technique in rhinoplasty, *Am J Rhinol Allergy* 2011;25(6):429-31.

<https://doi.org/10.22037/orlfps.v5i3.29756>

12. Hossam M, Foad T. Management of the droop tip: A comparison of three alar cartilage modifying techniques 2008.

13. Soliemanzadeh P., Kridel R.W., Nasal tip overprojection: Algorithm of Surgical Deprojection Techniques and Introduction of Medial Crural Overlay Archives of Facial Plastic Surgery 2005; 7(6): 374-80.

14. Constantian MB. The two essential elements for planning tip surgery in primary and secondary rhinoplasty: observations based on review of 100 consecutive patients. Plast Reconstr Surg 2004; 114:1571-81.

15. Kalantar-Hormozi A, Beiraghi-Toosi A. Smile analysis in rhinoplasty: a randomized study for comparing resection and transposition of the depressor septi nasi muscle. Plast Reconstr Surg 2014; 133:261-8.

16. Datema FR, Lohuis PJ. The Tongue-in-Groove Technique in Primary and Revision Rhinoplasty. Facial Plast Surg 2016; 32:416-23.

17. Williams EF. Alar-Columellar Disharmony Using the Tongue-in-Groove Maneuver in Primary Endonasal Rhinoplasty. Arch Facial Plast Surg 2012;14(4):283-8.