

Assessment of the Effect of Septocolumellar Suturing on Nasal Tip Rotation

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Abstract

Background: The nasal tip is the most dynamic and detailed part of the nose, and as such, proper alteration of the nasal tip structures remains one of the most difficult tasks of the rhinoplasty surgeon. The interrelationships between the structures forming the tip play an important role in the form and function of nose.

Aim of Study: To evaluate the efficacy of septocolumellar suture in improving nasal tip rotation.

Study Design and Setting: A prospective case series.

Patients and Methods: Thirty consecutive patients who underwent septoplasty, a suture was taken between the caudal septum and the columella after finishing septoplasty. Facial analysis followed by photographic documentation using standard photographic profile view. All findings had been registered in patients preoperative and postoperative sheet.

Results: Difference between preoperative and postoperative nasolabial angles in studied patients with mean 6.73 standard deviation 3.49 *t*-value 2.476441 and *p*-value <0.001 so it is statistically significant.

Conclusion: It can be concluded that septocolumellar suturing is an easy, less invasive and short duration procedure that has an effective role in improvement of the droopy nasal tip.

Key Words: *Nasal tip rotation – Suture technique – Nasolabial angle.*

Introduction

THE nasal tip is a three-dimensional structure Projection, width, and angle of rotation that impact appearance and the most prominent point of the lobule. This cartilaginous component of the nose is composed of the lower lateral cartilage and is influenced by the more cephalic components, such as the upper lateral cartilage and bony vault. Inter-

nally, the septum supports the overlying structures. Cartilage strength and skin thickness play a great role in the shape of the tip [1].

The nasal tip rotation can be assessed by different methods, but The nasolabial angle has traditionally been accepted as the parameter for tip rotation. The nasolabial angle is defined by is the angle between the base of the columella (subnasale) and the upper lip. In Caucasian males, this angle measures 80-100° and in females measures 90-110° [2]. The nasolabial angle is to a certain extent related to nasal function. The smaller this angle, the more vertical the inspiratory airstream enters the nose and the higher in the nasal cavity the air will reach [3].

Suture techniques for reshaping the nasal tip have been in use for many decades. However, the past two decade shave been the most influential in the advancement of the procedures commonly used today. Modern nasal tip surgery aims to directly reshape and reposition the various nasal tip components [4].

Septocolumellar suture can be described as a loop suture between the medial crura and caudal septum. According to the penetration level of this suture in both cartilages, several effects can be achieved.

Patients and Methods

This is a prospective case series that was performed on a thirty consecutive patients who underwent septoplasty at Otolaryngology Department, Tanta University in the period between August 2014 to February 2015. The study was approved by the institutional ethical committee. An informed consent was signed by every patient who participated in the study.

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Patients enrolled in the study were at least 18 years old and candidates for septoplasty for nasal obstruction complaint are included in the study. Patients having other nasal deformities, Craniofacial syndrome (e.g. cleft palate), less than 18 years or Patients who refuse participation in this study are excluded from the study.

Surgical technique: Septoplasty was done then a septocolumellar suture was applied. The fibroareolar tissue between the 2 medial crura was separated by angled scissors, exposing the inner surfaces of them (Fig. 1). The columellar skin edge of the transfixion incision is held by an Adson forceps at the midcolumellar level. The columellar skin overlying the medial crura is separated from the lateral surfaces. The preparation of only the middle 4-5mm of the medial crura is enough to place the suture. A 5/0 or 4/0 Prolene provided by Ethicon, Inc. (Somerville, N.J.) with a round needle is passed through the caudal end of septal cartilage near anterior septal angle from lateral to medial as in (Fig. 2). After that the needle passed through the columella to a point posteriorly to the point of

the caudal end and penetrating the left medial crus from outside to inside manner (Fig. 3), and then the right crus is penetrated from inside to outside. Then the suture is tied, thus bringing the medial crura to the septum. Both ends of the suture were pulled gently up and down to check out the symmetry. After that, simple suture must be taken between nasal spine or fascia around it and the caudal end of the septum then closure of the flaps by simple sutures by a 4/0 Vicryl provided by Ethicon, Inc. (Somerville, N.J.) and finally packing of the nose.

Preoperative and postoperative profile view photos were collected and a comparison between the nasolabial angles pre and post-operatively was done to determine the degree of rotation could be provided by this technique. The nasal tip rotation was evaluated by measuring the nasolabial angle (NLA) by Adobe Photoshop 8 (Microsoft corporation). Statistical analysis was done using SPSS program (SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc.) using (paired *t*-test).



Fig. (1): Dissection of the medial crura.



Fig. (2): Through the caudal end.



Fig. (3): Through the columella.

Results

The Fig. (4) showing the patient numbers, preoperative nasolabial angles, postoperative nasolabial angles and the difference between them.

Gender distribution in studied patients revealed that there was 14 males and 16 females.

Age distribution in studied patients revealed that the age ranged from 18 years to 39 years with average age 26.6 years and standard deviation 5.57.

Preoperative nasolabial angles in studied patients with mean 82.57 and standard deviation 10.31.

Postoperative nasolabial angles in studied patients with mean 89.3 and standard deviation 10.73.

Difference between preoperative and postoperative nasolabial angles in studied patients. With mean 6.73 and standard deviation 3.49 and *t*-value 2.476441 so it is statistically significant.

Subgroup analysis:

Male population: The number of male population was 14. Age distributed, preoperative nasolabial angles, postoperative nasolabial angles and the difference between in male population were statistically analyzed.

The age distribution in male studied patients revealed that age ranged from 18 years to 39 years with average age 26.63 years and standard deviation 5.57.

The average preoperative nasolabial angles in male subgroup in studied patients was 84.71 and standard deviation 9.97.

The average Postoperative nasolabial angles in male subgroup in studied patients was 90.43 and standard deviation 9.63

Average difference between preoperative and postoperative nasolabial angles in male subgroup studied patients was 5.71 Standard deviation 4.33 *t*-value 1.54 *p*-value <0.001.

Female population: The number of female population was 16, preoperative nasolabial angles,

postoperative nasolabial angles and the difference between them were statistically analyzed.

The average preoperative nasolabial angles in female subgroup studied patients was 80.69 with standard deviation 10.56.

The average postoperative nasolabial angles in female subgroup studied patients was 88.31 with standard deviation 11.84.

Average difference between preoperative and postoperative nasolabial angles in female subgroup in studied patients was 7.62 Standard deviation 2.33 *t*-value 1.92 *p*-value <0.001.

One of the cases: Male patient aged 24 years old with preoperative nasolabial angle 101 ° and postoperative nasolabial angle improved and became 112 °.

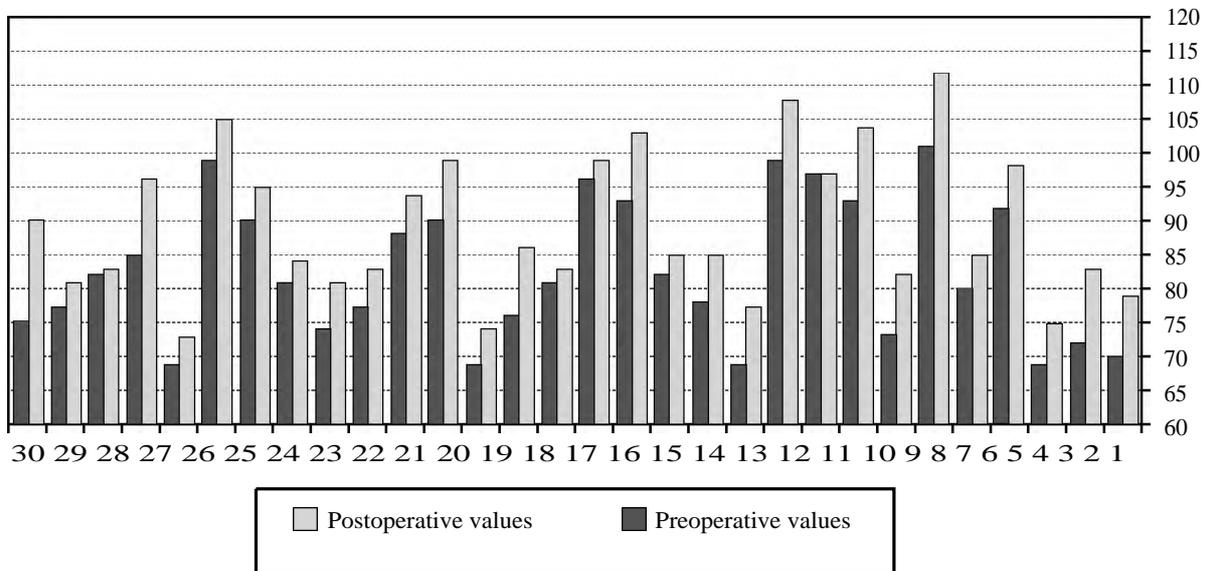


Fig. (4): Preoperative and postoperative values of the nasolabial angles.



Fig. (5): Preoperative nasolabial angle = 101 °.



Fig. (6): Postoperative nasolabial angle = 112 °.

Discussion

Several surgeons advise a variety of tip sutures. Septocolumellar suture is one of them, it is possible to apply this suture in a closed technique. According to the penetration level of this suture in both cartilages, several effects can be achieved. The tip rotation can be increased, the tip projection can be increased or decreased, and columellar show and hanging columella can be corrected, inserting the septocolumellar suture with a closed approach is easy to perform [5].

There have been ongoing controversies on the advantages and disadvantages of both open and closed rhinoplasty techniques. The advantages of application of the septocolumellar suture in closed approach are first, there is no disfiguring visible scar, which presents a special importance for Mediterranean countries. Second, the exact effect of the suture is easily determined while the knot is tied gradually and it is easy to obtain optimum result intraoperatively [6].

The tip complex slides downward during the healing period in many cases because there is no structure to hold it in its place. This leads not only to the loss of projection of the tip but also the supratip deformity. During this drop, columellar-bowing may appear.

Even if these do not happen, it is not uncommon to see that edema and fluid collection between the columella and caudal edge of the septum (despite taping) are replaced with fibrous tissue, which causes increased columellar show. A single septocolumellar suture alone can prevent these major drawbacks of rhinoplasty and decreases the need for open rhinoplasty in most cases, therefore limiting the dissection and making the adjacent structures less subject to disruption or distortion by postoperative wound contraction forces.

The resection of the caudal septum is generally required to increase the nasolabial angle and for the correction of the columellar show in closed rhinoplasty. This resection must be very limited or even omitted when the septocolumellar suture is used; otherwise, undesired widening of the nasolabial angle and columellar retraction may occur.

It is clear that the medial crura of the lower lateral cartilages and septum are rigidly fixed together with this suture, thus providing stability and with standing the effects of most of the forces which may change the position of them. Therefore the caudal septum acts as a strut graft to stabilize the tip complex. A single septocolumellar suture is

usually sufficient but, Sometimes, a second or even a third one can be placed, if required, for better results.

The cartilages are fixed rigidly by this suture; still, special attention must be paid to the tip of the nose in the first (6-8) postoperative weeks until the cartilages are welded together by the biologic cast. Tip massage is not allowed in this period to keep the fixed position of the cartilages [7].

Consequently, the magnitude of the dorsal resection may be diminished by the increase of the tip rotation achieved by septocolumellar suture. We usually remove humps smaller than seems to be necessary and create the dorsum-tip balance with the application of a septocolumellar suture. The amount of the lower lateral cartilages cephalic trimming is decided depending on the degree of the tip rotation. The application of the septocolumellar suture decreases the size of the trimmed parts.

In this study, this suture has been used in thirty cases of septoplasty without other rhinoplasty techniques in order to have a chance for proper evaluation of the rotation results of the technique.

The effect of application of the septocolumellar suture is inversely related to the tip supporting complex strength, so application of septocolumellar suture in older patients expected to be more efficient as the ligaments supporting the nasal tip are more lax.

In addition, the technique of septocolumellar suture by closed method preserve a lot of time and it takes minutes and decreasing overall surgery time and complications of long time exposure to anesthetic drugs especially for high risk patients. Also closed technique has the advantage of better circulation to the nasal tip skin and less postoperative edema.

The septocolumellar suturing technique is an easy efficient short duration procedure to improve the droopy tip results with less intraoperative difficulties and postoperative complications and it doesn't need much surgical experience in the field of rhinoplasty. In this study, this method proved its effect in increasing the nasolabial angle of a mean about 7 degrees and improving the nasal tip rotation. It could be more valuable to apply this suture in combination with other tip rotation techniques in severe droopy tip as columellar strut graft, bilateral lower lateral cartilage cephalic trimming and caudal end trimming.

In the published English literature, there was only one study that described the septocolumellar suture by Tezel E. and Numanoglu A. 2007 and improved rotation was found by this suture. However, they didn't compare between pre and postoperative nasolabial angles. The improvement of the nasolabial angle is mainly influenced by the good operative technique and the strength of tip supporting mechanisms. No systematic reviews or case series were found in the literature comparing results of different techniques of improving tip rotation.

Application the septocolumellar suturing can be suitable for cases complaining of aesthetic problem related to the droopy nasal tip, but it is expected not to give a marked improvement in cases of sever droopy tip that may need combined techniques.

Assessment of the effect of different techniques that improve the nasal tip rotation need further researches to compare the different results in the armamentarium of the rhinoplasty surgeons.

Conclusion:

Suturing of nasal tip is an easy approach to improve nasal tip rotation. The septocolumellar suture is one of the most important sutures that brings several advantages, such as being easy to perform, leaving no scar, and no need for predicting the results since the results can be observed during the operation and the results are permanent.

It can be concluded that septocolumellar suturing is a short duration, less invasive procedure that has an important role in improvement of the droopy nasal tip. Further studies are needed to evaluate the effect of other tip rotation techniques

on the nasolabial angle in different patients' categories and ethnicities.

Conflicts of interest:

No conflicts of interest declared.

Authors' contributions:

All authors had equal role in design, work, statistical analysis and manuscript writing.

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تقييم تأثير الخياطة الجراحية بين الحاجز الأنفى وعميد الأنف على دوران مقدمة الأنف

إن د عامة مقدمة الأنف تتكون من تناسق بين غضاريف وأربطة وأنسجة الأنف الأخرى وتتكون من ميكانيكيات عظمى وصغرى. ويعرف دوران مقدمة الأنف على أنه مكان مقدمة الأنف على طول قوس من سطح الوجوه. وقد أوضحت هذه الدراسة تأثير الخياطة الجراحية ما بين نهاية الحاجز الأنفى وعميد الأنف على دوران مقدمة الأنف. وقد تم التقييم عن طريق قياس الزاوية ما بين عميد الأنف والشفة العليا قبل وبعد إجراء العملية. والغرض من البحث تقييم كفاءة الخياطة الجراحية بين الحاجز الأنفى وعميد الأنف على دوران مقدمة الأنف. هذه الدراسة أجريت بقسم الأنف والأذن والحنجرة فى مستشفى طنطا الجامعى على ثلاثين حالة متتابعة من حالات تقويم الحاجز الأنفى بداية من شهر أغسطس ٢٠١٤ حتى شهر فبراير ٢٠١٥. لقد تم تقييم المريض قبل العملية بأخذ صورة جانبية للوجه وقياس الزاوية بين عميد الأنف والشفة العليا باستخدام برنامج ادوب فوتوشوب وصورة أخرى كذلك بعد العملية بثلاثة أشهر على الأقل مع الأخذ فى الإعتبار خصوصية بيانات المريض. المشاركون فى البحث هم المرضى الذين يعانون من إنسداد بالأنف نتيجة إنعواج الحاجز الأنفى. المرضى الذين لم يخضعوا للدراسة هم المرضى أقل من ١٨ سنة أو الذين يعانون من مشاكل تجميلية أخرى بالأنف أو مرضى سيولة الدم أو الذين يرفضون المشاركة. لقد تبين كفاءة ونجاح التقنية المستخدمة بالخياطة الجراحية بين نهاية الحاجز الأنفى وعميد الأنف. وقد لوحظ حدوث زيادة فى قيمة الزاوية بمتوسط حوالى ٧ درجات وتحسن بالشكل العام للأنف. هذه التقنية المستخدمة أثبتت سهولتها فى التطبيق وسرعة إجرائها ونجاح نتائجها مقارنة بالتقنيات الأخرى التى تزيد من دوران مقدمة الأنف.