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Original Article / Çalışma - Araştırma

A novel method to prevent complications of nasal osteotomy: matress suture which traverses lateral walls and septum

Nazal ostetomi komplikasyonlarını önlemede yeni bir yöntem: Lateral duvarlar ve septumdan karşılıklı geçen matres sütür

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ABSTRACT

Objectives: This study aims to investigate long-term nasal wall stability and prevention of nasal osteotomy complications using thin osteotomes without a nasal splint.

Patients and Methods: Between March 2012 and August 2014, 16 male patients (mean age 24 years; range 18 to 42 years) who were admitted with the complaint of appearance of nose to our clinic and were diagnosed with nasal deformity were included in this study. Primary rhinoplasty was performed on 15 patients, while secondary rhinoplasty due to open roof deformity was applied in one patient. After hump resection, two holes were made cranially and caudally over the each nasal bone. The mattress suture was performed by passing these holes to stabilize the nasal bone in a desired position following osteotomy. With this technique, only adhesive tapes were applied postoperatively. No external nasal splint was used.

Results: The mean follow-up was nine (range, 7 to 13) months. None of the patients experienced open roof deformity, inverted V deformity, nasal bone collapses or wall irregularities.

Conclusion: Our study results show that our technique is useful to reduce osteotomy complications and to reach the optimal cosmetic outcomes in rhinoplasty.

Keywords: Matress suture; osteotomy; rhinoplasty.

ÖZ

Amaç: Bu çalışmada nazal splintsiz ince osteotomların kullanımı ile uzun dönem nazal duvar stabilitesi ve nazal osteotomi komplikasyonlarının önlenmesi araştırıldı.

Hastalar ve Yöntemler: Mart 2012 - Ağustos 2014 tarihleri arasında burun görünümünden hoşlanmama yakınması ile kliniğimize başvuran ve nazal deformite tanısı konulan 16 erkek hasta (ort. yaş 24 yıl; dağılım 18-42 yıl) çalışmaya dahil edildi. On beş hastaya primer rinoplasti uygulanırken, bir hastaya açık çatı deformitesi nedeniyle sekonder rinoplasti uygulandı. Hump rezeksiyonu sonrasında her burun kemiğinde kraniyal ve kaudalde olmak üzere iki delik açıldı. Matres sütür, osteotomi sonrasında nazal kemiği istenilen pozisyonda tutmak için bu deliklerden geçecek şekilde yapıldı. Bu teknik ile ameliyat sonrası yalnızca adeziv bant yapıştırıldı. Harici nazal splint kullanılmadı.

Bulgular: Ortalama takip süresi dokuz (dağılım, 7-13) ay idi. Hastaların hiçbirinde açık çatı deformitesi, ters V deformitesi, nazal kemik çökmesi ve duvar düzensizlikleri görülmedi.

Sonuç: Çalışma bulgularımız, bu tekniğin osteotomi komplikasyonlarını önlemede ve ideal estetik sonuçlara ulaşmada kullanışlı olduğunu göstermektedir.

Anahtar Sözcükler: Matres sütür; osteotomi; rinoplasti.

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Osteotomies are one of the completing maneuvers of reconstructive and aesthetic rhinoplasty and can be performed by different methods.[1] Classically following lateral osteotomies, medial and transverse osteotomies are performed and superior bony attachments are separated by digitally creating greenstick fractures. Lateral osteotomy is one of the basic approaches for reshaping nasal alignment, narrowing the nasal dorsum and correcting the open-roof deformity which occurs after hump resection.[2] Nevertheless, lateral nasal osteotomy may be associated with complications such as functional nasal obstruction, postoperative aesthetic deformities, asymmetric nasal wall deformities, long-lasting edema and ecchymosis.[3] Therefore, some surgeons advocate the usage of thin osteotomes in order to prevent the trauma to the soft tissues and the periosteum that cause ecchymosis. The major drawback of this method is the high probability of relapsing of the in-fractured bones to the preoperative position. Other surgeons prefer more aggressive osteotomy with wide osteotomes. With this type of osteotomy, more periosteal tearing and soft tissue trauma are encountered.[4] Although the rates of recurrence decrease with aggressive osteotomy, risks of overcorrection and collapse increase unwillingly.

Recently, "no osteotomy rhinoplasties" have been preferred to reduce iatrogenic trauma.[5] However, major external deviations may not be corrected by this method and may result in patient dissatisfaction.[6] Splints are always used after osteotomies for nasal frame stabilization, edema reduction and shape maintenance. However, splint usage may be associated with problems such as reduced quality of life in hot weather, plaster burns, in-fractured nasal bones relapsing due to inappropriate splinting, conjunctivitis and scleral problems.

This method was applied male patients who had thick nasal walls and high relapse risk after greenstick osteotomy. The main purpose of this study was to show long-term nasal wall stability and prevention of in-fractured bones relapsing using thin osteotomes without application of external splint.

PATIENTS AND METHODS

Sixteen male patients (mean age 24 years; range 18 to 42 years) were included in this study. Fifteen patients underwent primary rhinoplasty and one patient underwent secondary rhinoplasty due to an open-roof deformity. All of the patients were photographed preoperatively (Figure 1, 2 and 3 upper rows), on the third day postoperatively (Figure 1, 2 and 3 middle rows), and on the ninth month postoperatively (Figure 1, 2 and 3 lower rows).

Primary rhinoplasty: After skeletonization of the nasal septum, the cartilaginous and bony dorsal humps were resected. Septal submucous resection was made preserving the L strut. Two holes were drilled over each nasal bone (four holes total per patient) with a 16-gauge branule needle and a hammer. The holes were 5 millimeters away from nasofrontal junction cranially and 5 millimeters away from the keystone area caudally, and 5 millimeters from the free edges of the bones (Figure 4). In two cases, the holes were prepared using micro drills because of thick nasal walls. A 2/0 PDS suture with a free needle was passed through the cranial hole of one nasal bone from inside to outside (Figure 5). The suture was then passed through the caudal hole of the same nasal bone

Figure 1. *Patient 1, a 20-year-old man. Upper row preoperative views, middle row third day postoperative views and lower row ninth month postoperative views are shown.*

Figure 2. *Patient 2, a 19-year-old man. Upper row preoperative views, middle row third day postoperative views and lower row ninth month postoperative views are shown.*

Figure 3. *Patient 3, a 22-year-old man. Upper row preoperative views, middle row third day postoperative views and lower row ninth month postoperative views are shown.*

from outside to inside, and was continued through the nasal septum. Then, the suture was pulled out of the caudal hole of the contralateral nasal bone, and passed through the cranial hole of the same contralateral nasal bone from outside to inside. Finally, the suture was passed through the nasal septum again, and was left untied (Figure 6, 7). We used the suture with a free needle to facilitate the movement of the suture through the holes. We passed the free needle in reverse from outside to inside then pulled the suture through. The osteotomies were performed in consideration of the width of the nasal bones (Six patients underwent

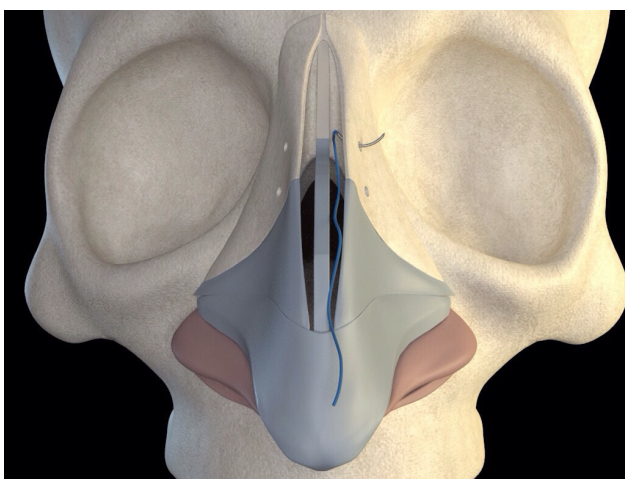

Figure 4. *Two holes were made over the each nasal bone cranially and caudally.*

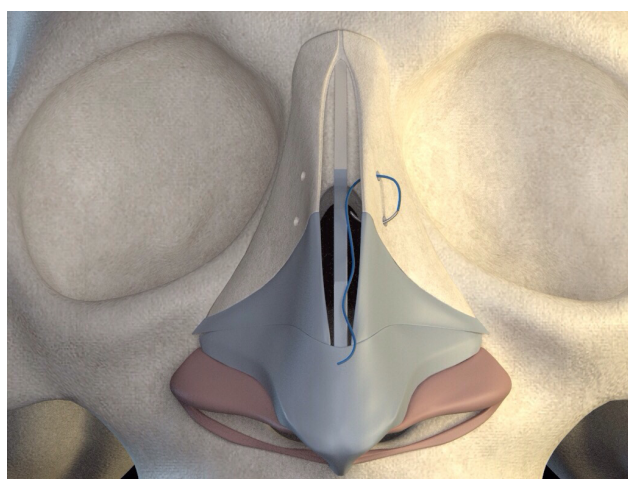

Figure 5. *Polydioxanone suture with a free needle was passed through the holes.*

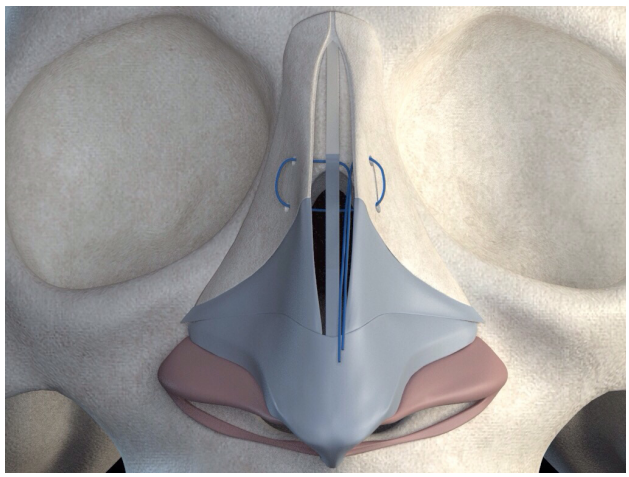

Figure 6. *After the suture was passed through the holes, it was also continued through the septum and left untied.*

low-to-high osteotomies, and nine patients underwent low-to-low and medial osteotomies. The secondary rhinoplasty patient underwent low-to-low lateral and medial osteotomies). The osteotomies were made with a 2 mm osteotome, and a greenstick type in-fracture was achieved with gentle digital pressure. Before internal nasal valve deformity correction, nasal bones were stabilized centrally by tying the free PDS suture ends. The knot was left under the nasal bones (Figure 8). The PDS suture caused no stress over the septum; thus, no septal deformity occurred. Spreader grafts were applied in all patients in order to prevent internal nasal valve narrowing deformity. Postoperatively, only adhesive tapes were applied over the skin. No external nasal splints were used.

Figure 7. *Intraoperative vies of the patient.*

RESULTS

The mean follow- up period was nine months (range, 7 to 13 months). No open roof deformities, nasal bone collapses or inverted V deformities were observed during the follow-up period. The complaints of all of the patients were noted at the first postoperative week. Four patients complained of edema, and ecchymosis, and all of the patients complained about internal nasal tampons. The patient who underwent secondary rhinoplasty declared that he felt more comfortable (but also insecure) without external splint.

DISCUSSION

When wide nasal hump excisions are performed, one of the most frustrating deformities that may be encountered is open-roof deformity. Thus, all patients who undergo lateral osteotomy should be analyzed carefully.[7] The open-roof deformity may be encountered especially in patients treated with thin osteotomes.[4] The nasal splint contributes to the stability of the nasal walls for only about one week. However the in-fractured bones have to be stabilized for at least 2-3 months for optimal results.[8] As the PDS strength retention is about 90 days, this technique provides extended support and precludes recurrence of the deformity. The nasal bones remain in the in-fractured position.

After osteotomy, the bones may slip posteriorly towards the nasal vestibule and this condition

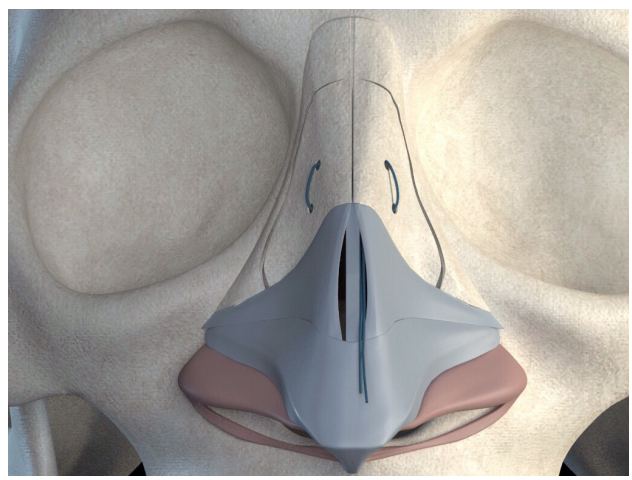

Figure 8. *Nasal bones were stabilized centrally by tying the free polydioxanone suture ends. The knot was left under the nasal bones.*

is called nasal bone collapse.[8] Correction of the collapsed nasal bones is difficult, but not impossible. The most effective treatment technique of this problem is to lift the collapsed bone to the desired position with a forceps, make holes over the nasal bones, and suture the nasal bones with wire or surgical sutures for stability.[8,9] Our technique decreases the risk of unilateral collapse of the nasal bones.

After hump resection, the upper lateral cartilages lose support, and their position changes inferomedially resulting in inverted-V deformity.[10] Our technique increases the support of the upper lateral cartilages by the suture passing through the nasal bones and the septum. Spreader grafts were applied for all of the patients, and septum and upper lateral cartilages were sutured to each other. Although the follow-up period was not enough in order to the evaluate the rate of inverted-V deformity, it is obvious that our technique supports the upper lateral cartilages well.

Extended operation time by an average of 20 minutes and requiring some experience are the main drawbacks of this method. Also, when the holes are drilled too close to the dorsal side of the nasal bone, comminuted bone fractures can occur.

We believe that this technique is an applicable one for patients who have thick nasal bones and therefore high relapse risk. Also, it decreases the nasal vault deformities, and thus reduces the reoperation rates.

Declaration of conflicting interests

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