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RESEARCH ARTICLE / ARAŞTIRMA

Augmentation rhinoplasty with autogenous cartilage grafts

F. Kasapoğlu, Ö. A. Özmen, H. Coşkun, O. Basut, S. Onart

Otojen kıkırdak greftleriyle augmentasyon rinoplasti

Amaç: Otolog greftler kullanılarak yapılan augmentasyon rinoplasti deneyimlerimizi sunmayı amaçladık.

Yöntem: 2003-2007 yılları arasında ameliyat edilen ve kayıtlarına ulaşılabilen toplam 32 hastamızı retrospektif olarak değerlendirmeye aldık.

Bulgular: Ameliyatların çoğu (%62.5, 20/32) travmatik nedenlerle, %37.5'i (12/32) revizyon cerrahilerdi. Hastalarımızda, tip projeksiyonunun sağlanması, dorsal augmentasyon, internal nazal valv açısının genişlemesi ve minor skar retraksiyonu gibi, genel olarak estetik açıdan, tatminkar sonuçlar elde edildi. Hastaların genellikle memnun olmadığı durumlar; greft materyalinin cilt altında rahatsızlık hissi, birkaç olguda yetersiz tip projeksiyonu, yetersiz nazal dorsal augmentasyon ve ciltte kalınlık hissi olarak saptandı. Bu istisnai durumlar dışında, çoğu hasta, tatminkar fonksiyonel ve estetik sonuçlara sahipti.

Sonuç: Otolog kartilaj veya kemik otogreftler veya bunların kombinasyonları Augmentasyon Rinoplasti'de tatminkar fonksiyonel ve estetik sonuçlar sağlamaktadır. Yeterli otogreft bulunmadığında, allogreftlerle kombinasyonlar yapılabilir.

Anahtar Sözcükler: Augmentasyon rinoplasti, otogreft, semer burun.

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Abstract

Objectives: We aimed to present our experience in augmentation rhinoplasty, using autologous grafts.

Methods: Between the years 2003-2007, whose registries were available, we evaluated 32 patients retrospectively.

Results: Most of the operations were for traumatic reasons (62.5%, 20/32), and 37.5% (12/32) of them were revision surgeries. Satisfactory results in projection of nasal tip, dorsal augmentation, widening of the internal nasal valve and low scar retraction, were obtained. Minor complaints of the patients were recognized as palpation of graft through the skin, underprojection of tip in a couple of patients, thickness of the skin and insufficient nasal dorsal augmentation. Out of these exceptional results, most of the patients had satisfactory functional and aesthetic results.

Conclusion: Autogenous cartilage or bone grafts or combination of the otografts in Augmentation Rhinoplasty, provides satisfactory aesthetic and functional results. Alloplastic materials should be combined, if sufficient otografts are not found.

Key Words: Augmentation rhinoplasty, otograft, saddle nose.

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Introduction

Nose is one of the most striking components of the face in aesthetical respect as even minimal anomalies attract attention. Dorsum defects of the nose not only create an undesirable aesthetical appearence but, may lead to functional problems that seek surgical care.

Augmentation rhinoplasty techniques are used to repair dorsum defects. Graft materials are the key point of these surgeries, however, ideal graft material remains

Fikret Kasapoğlu, MD; Ö. Afşın Özmen, MD; Hakan Coşkun, MD; Oğuz Basut, MD; Selçuk Onart, MD

Department of Otorhinolaryngology, Faculty of Medicine, Uludağ University, Bursa

controversial. Alloplastic materials are advantageous for being readily available, easy to shape and without any donor-site morbidity; but they pose the risk of infection and extrusion.[1] Bone and cartilage are frequently used as autogenous grafts.[2-4] Cartilage grafts may be harvested from nasal septum, auricula or rib depending on the needed amount of cartilage and availability. Bone grafts may be harvested from calvarium, rib, iliac crest, inferior turbinate or nasal crest of the maxillary bone.[2-4] These autogenous grafts do not have compability problems, on the other hand, fashioning these grafts to the desirable shape may be challenging. As the success of augmentation rhinoplasty operations are determined by milimetric ratios of the size of the grafts, experience and solicitude of the surgeon become critical.

We presented the long term aesthetic and functional results of augmentation rhinoplasties with autogenous cartilage and bone grafts.

Materials and Methods

Augmentation rhinoplasty was performed to 41 patients between January 2003 to December 2007. Thirty-two patients whose medical records were complete, constituted the material of the study.

Medical records of the patients were analyzed retrospectively. Age, sex, pre-operative findings, surgical findings and technique, post-operative findings, follow-up, complications and additional corrective interventions were recorded. Photographic analysis of the patients was done on pre-operative, post-operative 1st, 3rd, 6th 12th months and yearly photographs. Patients were asked to assess the functional and aesthetic outcome of their operation.

All rhinoplasty operations were performed under general anesthesia with open technique. Local infiltration of adrenaline and lidocaine was performed 15-20 minutes prior to operation in order to minimize bleeding. Antibiotic prophylaxis was given with intravenous cefuroxime axetil in dosage of 750 mg perioperatively which was continued orally for a week postoperatively. Septal cartilage, which was the first choice, was used if minimal (2-3 mm) dorsal augmentation was desired in the form of a shaped cartilage block or diced cartilage wrapped to surgicel as an dorsal onlay graft.[5,6] If septal cartilage was not available, auricular cartilage and in two patients maxillary crest bone was used for minimal dorsal augmentation. Costal cartilage was reserved for patients who needed greater augmentation and septal cartilage was not available, as it leads to donor site morbidity and prolongs the surgery time. In five patients Gore-Tex® implants were used in addition to cartilage due to their contour adjustment and augmentation effects. Open lumen silicone splints were used intranasally for 5-7 days and aluminum nasal splints externally for an average of 10 days.

Results

Nineteen of the patients were male and 13 of them were female. Mean age was 31.4 (SD=9.68) and median age was 29.5 (minimum=17, maximum=54). Twenty patients (62.5%) was performed as primary surgery and the indication was trauma in all of these patients. Twelve surgeries (37.5%) were revision.

Avarage post-operative follow-up was 19.8 months (SD=11.89) and median follow-up was 18 months (minimum=3, maximum=48). Costal cartilage was used in 20 patients, auricular cartilage was used in 3 patients and septal cartilage was used in 9 patients. Maxillary crest bone was used in 2 patients as dorsal onlay graft besides septal cartilage.

Revision surgery had to be done due to contour irregularity in two patients who were augmented with costal cartilage. In one of those patients irregular contour was corrected by trimming the cartilage in place. In the other patient, costal cartilage was removed, shaped and reinserted. Infection and abscess formation was encountered in the nasal root of a patient who underwent onlay augmentation with costal cartilage. Infection was relieved quickly with drainage and antibiotherapy. Four patients had nasal obstruction with inferior turbinate hypertrophy which was treated successfully with radiofrequency ablation.

Patients were generally satisfied with the cosmetic and functional results of the surgery.

Discussion

A variety of graft materials including autologous, homologous and alloplastic materials are used in the nasal surgery. Autologous cartilage, especially septal cartilage is considered as the ideal graft material due to its long term stability, low complication rates and high biocompatibility. Nevertheless, auricular or costal cartilage are used when septal cartilage is not available due to nasal trauma or previous nasal surgery. In cases with minor augmentation requirements, materials that are

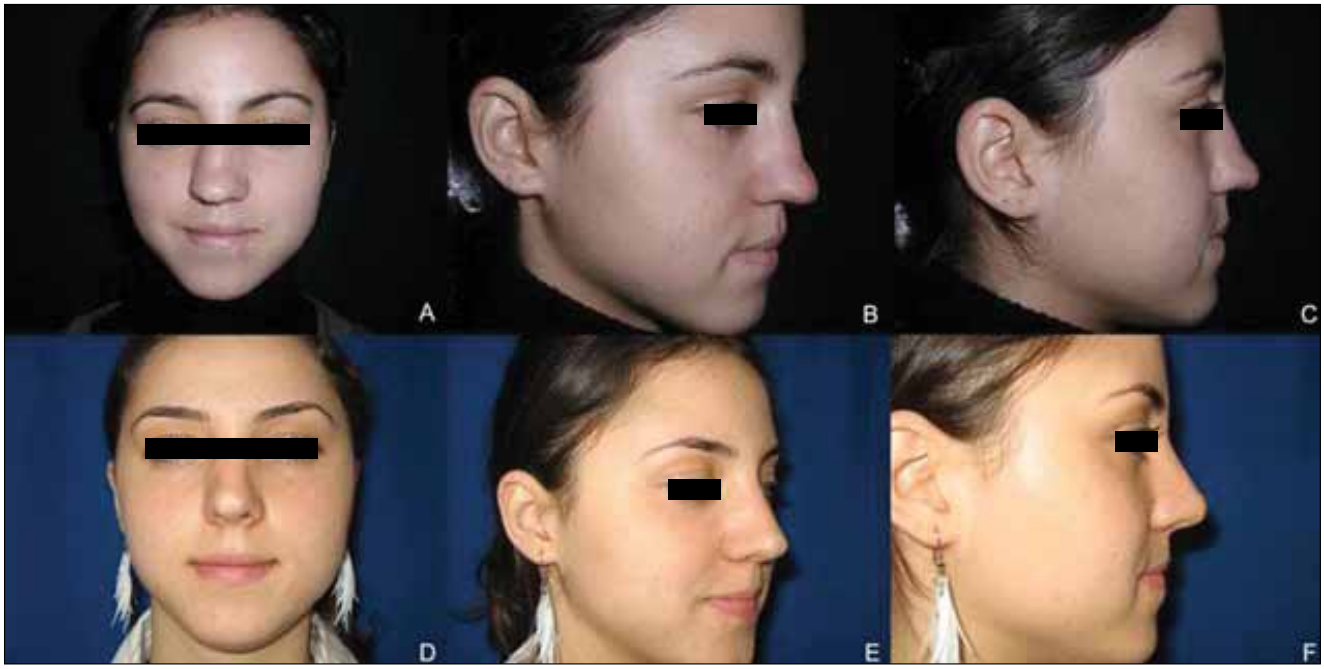

Figure 1. **A-C** Pre-operative views of a patient (primary surgery for a traumatic nasal deformity); **D-F.** Post-operative 12th month views of the patient. The patient underwent a revision surgery to adjust the contour irregularity of the costal cartilage at the left side of the radix at 18th post-operative month.

harvested from nose (turbinate bone, maxillary crest) or auricular cartilage which has lower donor site morbidity compared to costal cartilage are preferred. We used maxillary crest in two cases as dorsal onlay graft and auricular cartilage in three patients as dorsal onlay graft, columellar strut and alar batten graft.

Autologous graft materials are preferable in the structural reconstruction of the nose, due to their life-long durability as a result of high biocompability.[7-11] Additionally, they have potential to grow. Although, costal cartilage, costo-chondral graft and bone grafts are frequently used in the nasal augmentation, most preferable is costal cartilage. Nevertheless, problems related to surgical morbidity, physical shape, physiological adaptation and resorbtion were reported with the use of costal cartilage.

Homogenous implants are not widely accepted due to patient refusal and pronounced resorbtion rates.[12,13] A variety of alloplastic materials are available, however, complications such as foreign body reactions, infection, instability, extrusion are reported at varying ratios with these implants.[14,15] Gore-Tex® distinguish from other alloplastic materials with its high biocompability and low soft tissue reaction and infection rates.[14,15] We used Gore-Tex® in a limited number of patients in addition to septal cartilage for contour adjustment and additional augmentation. Depending on our results along with the wide series in the literature, our belief is that gore-tex® is the choice of option among alloplastic materials. An advantage of alloplastic materials over autologous implants is the long-term stability in size and shape of these materials.

Augmentation rhinoplasty is a special type of rhinoplasty and frankly there are many articles on this topic. In this article we would like to shortly overlook the literature, and as we did in our surgeries, would like to draw attention on combination of the otograft materials. This provides us less morbidity and more satisfactory results with the otografts especially obtained from the nose. Although in major deformities we need to get costal cartilage or auricular cartilage in more less deformities, if no material could be supplied from the nose.

In conclusion, costal cartilage is the acceptable graft material for nasal augmentation. It has low resorbtion, wrapping and infection rates. In cases with the need of minimal augmentation, septal cartilage and auricular cartilage are good options. Additionally, maxillary crest is an option in cases with the need of minimal augmentation. Gore-Tex® is also a viable option to be used

Figure 2. **A-C** Pre-operative views of a patient (revision of a septorhinoplasty operation which was performed 4.5 years ago at another medical center); **D-F.** Post-operative 6th month views (patient was satisfied both functionally and aesthetically).

along with autologous grafts for additional augmentation and contour adjustment.

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Conflict of interest statement:
No conflicts declared.

Correspondence: Fikret Kasapoğlu M. D
Department of Otorbinolaryngology, Faculty of Medicine, Uludağ University, 16059 Nilüfer, BURSA
Phone: (0224) 295 26 21
Fax: (0224) 442 80 91
GSM: (0532) 473 81 53
e-mail: fkasapoglu@uludag.edu.tr, fikretkbb@yaboo.com