

**OUTCOME OF AUTOGENOUS VERSUS ALLOPLASTIC GRAFTS (MEDPORE) FOR RECONSTRUCTIVE AUGMENTATION RHINOPLASTY****Ahmad Taha, Yasser Helmy, Mostafa Mikki, and Abdel nasser Khallaf**

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**ABSTRACT**

**Background:** Many nasal deformities are requiring correction by augmentation rhinoplasty. Autologous and alloplastic graft materials have been used for nasal dorsal reconstruction. **Objectives:** This study was designed to compare the clinical outcome Autogenous Versus Alloplastic Grafts (Medpore) For Augmentation Rhinoplasty. **Results:** Better functional and aesthetic results in patients whom were submitted for autogenous augmentation rhinoplasty. **Conclusion:** Our results are recommending autogenous grafts for nasal reconstruction. The autologous grafts are remaining superior to allografts for reconstruction and/or augmentation rhinoplasty.

**KEYWORDS:** Autogenous - Alloplastic - Grafts -Augmentation Rhinoplasty.**INTRUDUCTION**

Congenital, iatrogenic and traumatic aetiologies can produce a deficiency or deformities in the nose and are requiring correction and with augmentation.<sup>[1]</sup>

Entities such as congenital hypoplasia or traumatic destruction of the nasal skeleton may also be associated with abnormalities of the skin envelope, endonasal lining, periorbital bones and midface.<sup>[2]</sup> Congenital post clef lip nasal deformities, over resected dorsa and saddle nose deformities are commonly require corrective augmentation.

Many autologous and alloplastic graft materials have been used for nasal dorsal reconstruction.<sup>[3,4]</sup> Autologous cartilages are the most commonly used and preferred graft materials.<sup>[5,6,7,8]</sup> Autologous materials generally incorporate well into the surrounding tissues, permitting permanence over time and the opportunity to replace "like tissue with like tissue."<sup>[9]</sup> Although autologous materials are more resistant to infection than are alloplasts, the possibility of resorption and various donor-site morbidities must be considered.<sup>[10]</sup>

Currently, there are many techniques and methods with different alloplasts and autografts for correcting the nose deformities. Some surgeons used the alloplastic implants for nasal reconstruction and chin augmentation. This

biocompatible material has been used successfully during the last years for various applications in reconstruction of the facial skeleton.

In our study, we aimed to compare the long-term functional and aesthetic results for Autogenous Versus Alloplastic Grafts (Medpore) For Augmentation Rhinoplasty

**MATERIAL AND METHODS**

Our study was designed as comparative prospective on 53 patients and divided into two arms, group1, in which patients were submitted for augmentation rhinoplasty by autogenous tissue and group2, in which patients were submitted for augmentation rhinoplasty by alloplastic material.

In group1, 29 patients, 15 females and 14 males, whom were underwent autogenous bone and/or cartilage grafts (autograft). Source was variable according to clinical indication, we used autogenous costochondral, hip bone, ear conical and nasal septal cartilage sources. In group2, 24 patients, 14 females and 10 males, whom were underwent augmentation rhinoplasty with alloplastic materials, (Medpore). All patients were operated under general anaesthesia using open rhinoplasty approaches for autogenous or alloplastic reconstruction or augmentation rhinoplasty. (Fig.1A, B).



**Fig. 1A: Alloplastic dorsal graft fixation**      **1B: Autologous septal cartilage graft fixation**



**1C: Costochondral graft**      **1D: Hip bone graft**

Functional assessment through subjective relieve of symptoms and objective assessment of breathing, both basal preoperative and postoperative at regular intervals every 3 months up to 2years. Facial aesthetics assessment as regard nasal units, tip projection, rotation, dorsal height, Nasolabial angles, Nasofacial angles. A questionnaire was designed to assess the patient’s degree of aesthetic satisfaction with different aspects specially, natural appearance, patient satisfaction, if she or he feels bad smells, or any other complications.

Long-term follow-up results for 24 months for all patients whom are underwent nose correction with autogenous or alloplastic materials, with evaluation of functional breathing and aesthetic outcome.

Study was carried out at Al-Azhar University and Ahmed Maher educational hospitals in period from September 2011 to November 2016. Informed consent form all patients for using their data and photography was obtained. Study was approved by ethical committee of Al-Azhar university. Study Data was analysed statistically using (SPSS), statistical package of social sciences, v.21.0, SPSS Inc., Chicago, IL, USA. Results were presented as simple percentage accompanied by description of comments. Chi – square and Fisher's exact tests. P-value of 0.05 or less was considered insignificant. Table (1,2) are showing characteristics of each group.

**Table (1): Group 1, 29 patients whom were underwent augmentation rhinoplasty with Autologous grafts.**

No. of patients	Sex		Age / years	Nasal defects	Etiopathology	Types Autologous grafts
	M	F				
10	6	4	17 to 24	Saddle nose, columellar and alar supports	Post cleft lip nasal deformities	-Costochondral -Conchal cartilages
8	6	2	25 to 45	Saddle nose, nasal tip, and internal nasal valve	Post traumatic	-Hip bone, -Nasal septum cartilage
6	5	1	28 to 24	Saddle nose, nasal, internal nasal valve, tip and columellar support	Post rhinoplasty (iatrogenic)	-Nasal septum, -chonal cartilages
5	2	3	18 to 28	Saddle nose	Congenital	-Costochondral, -hip bone

**Table (2): Group2, 24 patients whom were underwent augmentation rhinoplasty with alloplastic materials.**

No. of patients	Sex		Age / years	Nasal defects	Etiopathology
	M	F			
11	4	7	19 to 30	Saddle nose and columellar support	Post cleft lip nasal deformities
5	4	1	20 to 45	Saddle nose	Post traumatic
4	1	3	25 to 35	Saddle nose, tip and columellar support	Post rhinoplasty (iatrogenic)
4	4	Zero	30 to 40	Saddle nose	Congenital

**RESULTS**

The patients in group1, had higher nasolabial and nasofacial angle degrees than those in group2. When the results from the personal satisfaction questionnaire were

evaluated, group1, was superior in satisfaction with appearance and group 2, was superior in postoperative activity level (fig. 3,4).



(A) Preoperative front view



2 years postoperative front view

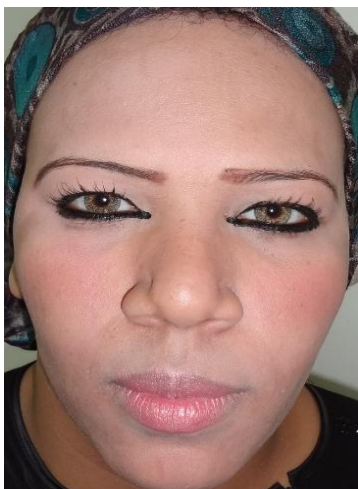


(B) Preoperative lateral view



2 years' postoperative lateral view

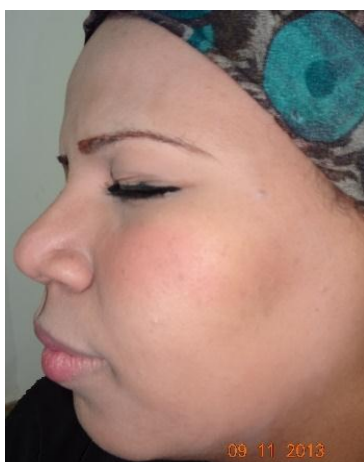
**Fig.3: Autologous costochondral graft for nasal dorsum augmentation**



(A) Preoperative front view



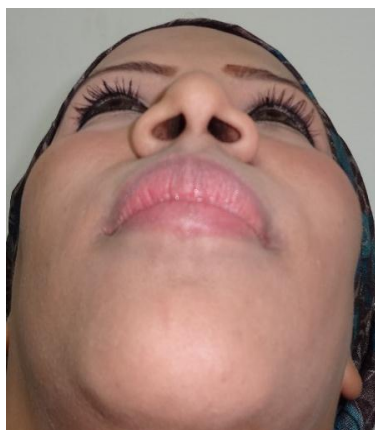
2 years postoperative front view



(B) Preoperative lateral view



2 years postoperative lateral view



(C) Preoperative basal view



2 years postoperative basal view

**Fig. 4: Alloplastic material (Medpore) for nose dorsum and columellar strut.**

However, there was no difference between the two groups in terms of general aesthetic satisfaction. Most of the patients in groups 1, (93%) and in group 2, (74%) are

rated their noses as good to excellent. The ratio of excellent points was greater in group 1 (Table 3).

**Table (3): The Degree of Satisfaction for Patient**

Scope of Evaluations	Group1 (29 patients)			Group2 (24 patients)		
	Poor	Good	excellent	Poor	Good	Excellent
Personal satisfaction with shape	5	10	14	3	7	13
General aesthetic satisfaction	2	11	17	4	9	12
Satisfaction with appearance	4	5	18	2	8	13
Satisfaction with tip projection	3	5	21	2	9	15
Relief of physical symptoms	1	13	15	3	10	11
Postoperative activity level	10	12	7	1	5	19

For each group, preoperative complaints are decreased dramatically during the postoperative period. In scoring the photographs taken by the physicians were evaluated the aesthetic appearances of group 1 as superior to those of group 2, whereas they did not observe a difference with other features. In group 1, 50% of patients were evaluated as good to excellent in terms of shape of the nose as compared with 37% in group 2.

About complications, the most prominent were graft infections 16.7% in group 2, 3.4% in group 1. Foreign body feeling in the nose was reported in 75% in group 2 and 3.4% in group 1. Most of the patients in group 2 (90%) were complaining of bad smell inside their nose and one patient asked to remove the alloplastic graft but no any at group1. Hard feeling in the grafted area was 6.8% in group 1 and 25% in group 2.

Early complications such as graft infection, mobilization of the graft, narrowing the external and internal valve angles of the nose and nasal dorsum skin hyperaemia were significantly greater in group 2 than in group 1. However, there is no graft extrusions occurred in both groups. Our results show better functional and aesthetic results in patients whom were submitted for autogenous corrective rhinoplasty.

## DISCUSSION

The use of alloplastic implants for nasal hard tissue replacement, despite the obvious advantages of ready availability without donor site morbidity, is discouraged by most authors because of the high incidence of displacement, infection, and extrusion.<sup>[11,14]</sup> Even though complication risk is inversely proportional with the time passed for biologic grafts, alloplastic materials have an unpredictable potential to cause problems even after a few decades of implantation. Autologous or homologous cartilage has proven to be satisfactory for repair of minor deficiencies of the nasal dorsum, nasal tip, and columella.<sup>[3,4]</sup>

However, they are inadequate for major bony defects requiring structural reconstruction related to the limited size of the cartilage implants, unpredictable resorption rates and their inability to achieve fixation to underlying bone.<sup>[4]</sup> In addition, allograft cartilage is similar to an alloplastic implant in that it is avascular and any healing

that occurs is by isolation of the graft in a fibrous capsule rather than by incorporation into the skeletal framework.

So, most surgeons prefer autologous cartilage grafts for mild cases and autologous bone grafts for moderate to severe cases of dorsal nose defects.<sup>[9,10]</sup>

This study was designed to evaluate the clinical outcome in terms of functional and aesthetic assessment.

The most commonly used donor sites for autogenous bone grafts are ribs, septal cartilage, iliac crest, the cranium and concha of the ear. Although rib grafts are preferred as a first choice by some authors<sup>[11,12]</sup> to take the opportunity of harvesting a Monobloc osseocartilaginous tissue, major problems are observed after nasal reconstruction with iliac or rib bone such as unpredictable resorption, development of irregularities, and loss of initial augmentation, shape and volume.<sup>[13,14]</sup> These results were correlated to our study when 3 cases developed graft resorption and had been re-operated again after 6 months, using another autogenous donor source. We had corrected irregularities which had reported in 4 cases by FDA approved filler made by calcium hydroxyapatite without any need for further surgical revision.

In this study the autogenous source was variable according to clinical indication, we used autogenous costo-chondral, hip bone, ear conical and nasal septal cartilage sources.

Donor site morbidity, conversely, continues to be a major factor when obtaining a bone graft and it is an added morbidity regardless of the site. Disadvantages of the chest donor site include the potential for pneumothorax, hematoma, chest wall depression and persistent pleuritic pain with exercise. Harvest of grafts from the iliac crest is associated with postoperative pain, paraesthesia from injury to the lateral femoral cutaneous nerve, late contour deformity, possible gait disturbance and the occasional occurrence of acetabular fracture.<sup>[15,16]</sup> The calvarias graft can be harvested easily and without a discernible scar or depression because of its accessibility beneath the scalp. The donor site is typically pain free when compared with other usual bone graft donor areas.<sup>[17]</sup> Inherent risk of intracranial injury during harvesting is mentioned, but clinical reports are scarce.

Those previously reviewed data was completely correlated with our study findings.

In this study, the Medpor implant is a relatively has several advantages over other alloplasts. It is a pure polyethylene with a unique manufacturing process and pore size. Technically, it is easy to work with; it can be carved, contoured, adapted and fixated to obtain a precise three-dimensional framework. Physically, it is a pure, biocompatible, strong substance that does not resorb or degenerate. It is stable in the long term with good tensile strength, resistance to stress and fatigue and a virtual lack of surrounding soft tissue reaction. Tissue rapidly goes into pores. Extensive vascular ingrowth creates the potential to transport cellular products that fights infection deep into the implant.

In this study, the most prominent complications were higher in alloplastic treated with group, higher than autogenous grafts treated one, as regard, graft infections, foreign body feeling, bad smell or hard feeling of the implant on the long run follow up.

Successful nasal bone granting, with maintenance of nasal projection, contour, and minimization of bony resorption, is dependent on primary bone healing. Successful aesthetic results in our study are related directly to the surgeon's ability and experience, like in all surgical operations but, the patients feeling of foreign body and sense of bad smell in their nose are still question and main disadvantage of the alloplastic grafts.

## CONCLUSION

Our Results are recommending autogenous grafts for nasal reconstruction. The autologous grafts are remaining the gold standard functional and aesthetic reconstruction, when compared with allografts for augmentation rhinoplasty.

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