

Use of Autologus Cartilage Grafts in Augmentation Rhinoplasty

Muhammad Saeed, Farooq Ahmed Mian

ABSTRACT

Objectives: To study merits and demerits of autologous cartilage grafts used in augmentation rhinoplasty. **Design:** Comparative. **Setting:** Study carried out in the department of ENT Allied Hospital Faisalabad. **Period:** From June 2005 to June 2010. **Material and Methods:** The majority of patients were admitted through ENT out patient department. The data was collected on the basis of history, physical examination, investigations, photography, management and follow up. **Results:** Total 50 patients 35 males (70%) and 15 females (30%). The majority of patients were from 3rd decade of life (53%). The duration of deformity in majority of patients was with in 2

years (73%). Majority of patients were belonging to the lower class (60%). In many of the patients indication for augmentation rhinoplasty was cosmetic (100%). In all patients autologus cartilage graft was used (100%). The etiological factor for saddle deformity in majority of cases was trauma (67%). Overall success rate was 94%. **Conclusion:** The autologus cartilage grafts because of their lower rate of infection, rejection, resorption, extrusion, donor site morbidity, easy reshaping and due to their natural look should be regarded as the graft of choice in augmentation rhinoplasty. **Key Words:** Rhinoplasty, augmentation, autologus cartilage.

INTRODUCTION

The rhinoplasty is an operation planned to reshape the anatomic features of the nose into a new more pleasing relationship with one another and the surrounding facial features.¹ The rhinoplasty consists of septoplasty, tip remodeling, hump removal, narrowing of nose with osteotomies and final correction of subtle deformities.² For rhinoplasty good practical knowledge of the anatomy is necessary.³ The results achieved in rhinoplasty are directly related to the surgeon ability to elucidate how subtle change in the bony and cartilaginous support of the nose will change its appearance.⁴ Thus any rhinoplastic surgeon requires thorough and sophisticated knowledge and understanding of the normal and pathologic anatomy of the nose.⁵ The cartilaginous septum and maxillary bone crest form the main support of the lower two thirds of the nasal dorsum if there is insufficient cartilage to give support either due to absence or fibrosis of the cartilaginous part of the septum nasal saddling to various degrees will result.⁶ Nasal saddling is

therefore commonly seen after septal haematoma, septal surgery or trauma and if haematoma is infected nasal collapse is almost inevitable. Immediate grafting is advocated by some⁷ but in most instances grafting of the dorsum is deferred until the degree of saddling is evident. Loss of septal support for the nasal dorsum although resulting mainly from trauma may follow many of chronic inflammatory conditions which involves cartilage such as sarcoidosis, tuberculosis and syphilis. Malignant granuloma may also damage septal cartilage and lead to nasal dorsum collapse some degree of saddling may also be a familial or racial characteristic. Proper and standardized preoperative and post operative photograph is essential in rhinoplasty.⁸ In addition to examination of the patient and its correlation with clinical experience and artistic judgement photograph are the best practical means for correct analysis. Photographs are essential for medical record and for medicolegal purpose. The photographs views which are

commonly taken includes frontal view, right and left lateral views, basal view, and oblique view. There is a wide variety of graft materials available for nasal augmentation which are successfully used. A surgeon success with one or another of the implant material will determine his preference. To be successful one must have a working knowledge of all the implant material available. Each portion of the nose has different characteristics that may require different augmentation material. Several different materials can be used to augment the nose. Available augmentation materials can be classified as autologous grafts and nonautologous graft materials. The main nonautologous materials include Medpor, silicone, silastic, Gore-Tex, and the acellular dermis product marketed as AlloDerm. Opinions regarding the indications for and outcomes with using these materials vary. Autologous materials consist of bone, cartilage, or both harvested from the nasal septum, ear, rib, and calvaria. Many prominent surgeons believe that autologous materials are readily available and that the morbidity associated with harvesting the autologous grafts is low. They also believe the aesthetic and long-term functional outcomes are superior and the complication rates are low. Therefore, they advocate the use of autologous grafts over nonautologous materials. Bone is usually needed only in patients with very deficient dorsi with saddle-nose deformities. Autologous cartilage has considerable advantages over allograft. It does not induce immune response and has a very much lower rate of infection and extrusion. It is also easily harvested and sculpted and is available in plentiful supply. Finally the psychology⁹ of the patient should be kept in mind to avoid conflicts over the post operative appearance of nose. The surgeon must elicit the expectations, concerns, and motivations of the patient seeking rhinoplasty. Establishing a good rapport with the patient can help increase the potential for satisfaction with the postoperative result.

MATERIAL AND METHODS

It was a prospective study conducted upon 50 patients suffering from saddle deformity of nasal dorsum in the department of ENT Allied Hospital Faisalabad from June 2005 to June 2010. The patients were admitted and detailed history, clinical examination, routine investigations and special investigations including photography were carried out. Standard Performa was prepared dually filled for each patient. Only those patients were included in study who were suffering from saddle deformity of nasal dorsum and were available for follow up and those patients who were unfit for surgery and those cases operated some where else were excluded from study. The follow up of cases was carried out from 6 months to 36 months. All the patients were operated for augmentation rhinoplasty using one of these autologous cartilage grafts septal cartilage, auricular cartilage and costal cartilage.

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RESULTS

Total 50 patients suffering from saddle deformity of nose 35 males (70%) and 15 females (30%) between 16 years to 50 years of age. The majority of patients were from 3rd decade of life (53%). The duration of deformity in majority of patients was with in 2 years (73%). Majority of patients were belonging to the lower class (60%). In many of the patients indication for augmentation rhinoplasty was cosmetic (100%). In all patients autologous cartilage graft was used. The etiological factor for saddle deformity in majority of cases was trauma (67%). Overall success rate was 94%. The incidence of wound infection with costal cartilage was 20%, septal cartilage 17% and auricular cartilage 10%. The p value in case of wound infection was 0.820. The incidence of dorsal site morbidity with costal cartilage was 20%, septal cartilage 33% and auricular cartilage 10%. The p value in case of wound infection was 0.308. The incidence of Incidence of margins show with costal cartilage was 10%, septal cartilage 13% and auricular cartilage 30%. The p value in case of wound infection was 0.390. The rate of graft absorption and extrusion with all the autologous cartilage grafts were 00%. The overall success rate with costal cartilage was 100%, septal cartilage 93% and auricular cartilage 90%. The p value of success and failure rate was .623

Table 1:
Duration of deformity at the time of presentation
N = 50

No	Duration in years	No of patients	Percentage
1	0-2Y	35	70%
2	3-5Y	10	20%
3	6-8Y	03	06%
4	>8Y	02	04%
5	Total	50	100%

Table 2:
Indications for augmentation rhinoplasty N = 50

No	Disease	No of Patient	percentage
1	Cosmetic	50	100%
2	Nasal obstruction	00	00%
3	Total	50	100%

Table 3:
Nature of autologous grafts used for augmentation rhinoplasty N= 50

No	Graft nature	No of patient	Percentage
1	Septal cartilage	30	60%
2	Costal cartilage	10	20%
3	Auricular cartilage	10	20%
4	Total	50	100%

Table 4:
Etiology of saddle deformity in patients

No	Etiology	No of Patient	Percentage
1	Trauma	30	60%
2	Infection	10	20%
3	Familial / congenital	00	00%
4	Surgery	10	20%
5	Granulomatous disease	00	00%
6	Total	50	100%

Table 5:
Incidence of graft absorption N=50

No	Complications	Total patients	No of Patients	Percentage
1	Septal cartilage	30	00	00%
2	Costal cartilage	10	00	00%
3	Auricular cartilage	10	00	00%

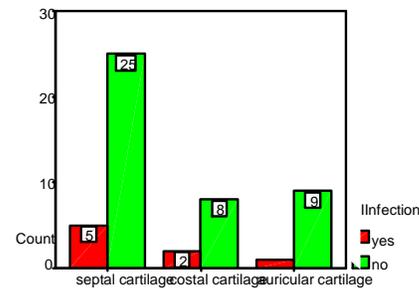
Table 6:
Incidence of Graft Extrusion

No	Complications	Total patients	No of Patients	Percentage
1	Septal cartilage	30	00	00%
2	Costal cartilage	10	00	00%
3	Auricular cartilage	10	00	00%

Table 7:
Success and failure rate of autogenous cartilage grafts

No	Graft Nature	Total patients	Success rate	Failure rate
1	Septal cartilage	30	28 (93%)	02(07%)
2	Costal cartilage	10	10(100%)	00(00%)
3	Auricular cartilage	10	09(90%)	01(10%)

Figure-1
Incidence of infection in autologous cartilage grafts



Pearson Chi-Square .397 df 2 P value .820

Figure-2
Incidence of dorsal site morbidity in Autologous cartilage grafts

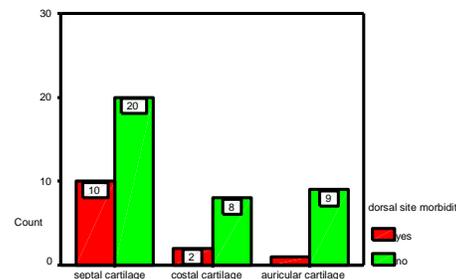
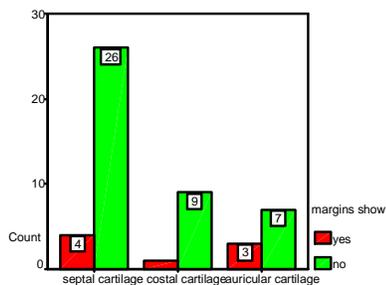
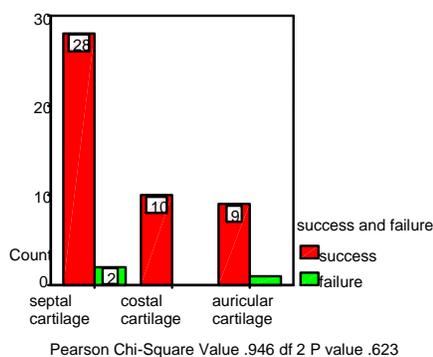


Figure-3
Incidence of margins show in Autologus cartilage grafts



Pearson Chi-Square Value 1.885 df 2 P value .390

Figure-4
Success and failure rate of Autologus cartilage grafts



DISCUSSION

To obtain aesthetically pleasing results, ensure patient satisfaction, and minimize complications, the rhinoplastic surgeon must possess a thorough knowledge of nasal anatomy and ideal facial aesthetic proportions. The rhinoplastic surgeon must be familiar with all types of graft material and the current methods to correct nasal deformities.¹⁰ Autogenous grafts offer advantages over alloplasts in that they do not elicit immune response in the recipient site this causes lower rate of infection, tissue reaction and extrusion of the implant.¹¹ Autogenous cartilage offers certain considerable advantages over other grafts that the tissue feels more natural, they are easy to mould and have a low index of resorption.¹² Nasal septum is often a useful supply of cartilage that is easily harvested at the time of surgery. Septal cartilage can be shaped and bent itself well to layering where it is necessary to build

up more than one layer thickness of cartilage.¹³ In a study done by Godfrey NV on augmentation rhinoplasty by using septal cartilage graft the success rate was 90% and failure rate was 10% where as in our study the success and failure rate of septal cartilage graft was 94% and 06% respectively.¹³ Conchal cartilage is an extremely useful source of cartilage for use in augmentation rhinoplasty. It can be harvested without any cosmetic change to the pinna as long as the antihelical fold is not transgressed. It can be shaped easily and has low rate of complications. Unfortunately it has the disadvantage of being slightly asymmetrical in the shape and this must be taken in to account when shaping of the graft is under taken¹⁴. The success rate of auricular cartilage graft was 90% in our study but success rate was 100% in study conducted by Murrell and George¹⁵ Costal cartilage graft is used in more extensive deformities. It has disadvantages of incurring significant donor site morbidity such as scarring of chest wall and possible complication of pneumothorax there fore it is used mainly when other source of cartilage is insufficient.^{16,17} The results of the rib cartilage grafts when used in augmentation rhinoplasty are Satisfactory for the patients and resorption rates are not high enough to change the Shape of the nose.¹⁸ The seventh rib is the ideal rib graft by virtue of its safe location and over all size for grafting and it provides the greatest overall available length (90.7 mm, right;89.6 mm, left) and thickness (17.6 mm right;17.5 mm, left) there fore it is advocated as the ideal choice for augmentation rhinoplasty.¹⁹ In our study the success rate of rib cartilage graft was 100% and failure rate was 00% where as the study of C.S Mura Kami, T.A Cook and R.A Guida the success and failure rate of rib cartilage graft in augmentation rhinoplasty was 78% and 22% respectively.²⁰ In the study conducted by Cervelli L et al the success and failure rate of rib cartilage graft was 94% and 6% respectively²¹. The overall success and failure rate of autogenous cartilage in our study was 94% and 6% respectively where as the study conducted by Bateman N, Jones NS on results of autogenous cartilage in augmentation rhinoplasty the success and failure rate was 84% and 16%.²² In an other study conducted by Escobar Sanz et al the over all success and failure rate of autologus cartilage grafts was 88% and 22%

respectively.²³ In another study conducted by Muhammad Ahmed, Shahid Hussain et al the use of autogenous cartilage grafts Was done for augmentation of nose with excellent results.²⁴

CONCLUSION

The autologous cartilage grafts because of their low rate of infection, rejection, resorption, extrusion, low donor site morbidity, easy reshaping and due to their natural look should be regarded as the graft of choice in augmentation rhinoplasty.

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AUTHORS

- **Dr. Muhammad Saeed**
Associate Professor of ENT
PMC/Allied Hospital Faisalabad
- **Dr. Farooq Ahmad Mian**
Professor of ENT
PMC/Allied Hospital Faisalabad