

Research Article

Outcome of Type 4 Saddle Nose Deformity Using Combination of Block and Diced Cartilage

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Abstract

Introduction: Saddle nose is a commonly encountered nasal deformity which is still challenging to treat. Our aim was to determine the efficacy of type IV saddle nose deformity using combination of block and diced cartilage.

Methodology: This descriptive case series was held at Plastic Surgery Department and burn unit, Mayo Hospital, Lahore from 1st March 2019 to 29th Feb 2020. A total of 60 (16 female, 44 males) patients with type 4 saddle nose admitted from outdoor department were selected for this study. The cases underwent open rhinoplasty and after raising the mucoperichondrial flaps septoplasty was done and dorsal augmentation done by using both the diced and the block cartilage. Results were assessed in the immediate post-operative period and at 12 months for recurrence and dorsal deviation. The data were entered and analyzed by using SPSS-23.

Results: Our study showed that use of combination of block and diced cartilage for type 4 saddle nose deformity is efficacious. Out of the 60 patients included in our study, nasal dorsum deviation was seen in only 5 (8.3%) patients, and recurrence of saddle nose was seen in 5 (8.3%) patients

Conclusion: The use of combination of block and diced cartilage for augmentation of type 4 saddle nose is very effective. It provides a unique solution to saddle nose deformity by restoring the structural support and contour with minimal recurrence

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Introduction

Beauty consists of due proportion, for the senses delight in well-proportioned things'. Thomas Aquinas (c. 1225–74), *Summa Theologiae* (1265–73). This is all the more important for the nose as it is the most prominent part of face. Saddle nose is a common deformity encountered in plastic surgery, yet it remains one of the most challenging deformities to treat.^{1,2} Saddle nose deformity results from disruption of septal support and is characterized by middle vault depression and widening, columellar retrusion, tip over-rotation, deprojection, and nasal shortening. Numerous classification systems describe the manifestations of saddle nose, including those by Vartanian, Tardy et al, and

Daniel and Brenner.^{1,3,4} Correction of saddle nose deformity requires nasal augmentation.

Different Reconstructive materials available for nasal augmentation are alloplastics, autografts, homo grafts and xenografts. None have been described to be perfect. Biological and alloplastic materials have been in use for reconstruction of saddle nose for the last few decades. Alloplasts were the initial choice as they were readily available and did not have donor site issues. However the trend has shifted towards using biological materials. A systematic review done in 2018 by Liang et al has shown that with the use of autologous costal cartilage the complication rate was 14% as compared to with the use of alloplastics which has complication rate of

8%.⁵ However, in another study autologous costal cartilage blocks are deemed superior, especially in Asian noses with thick skin, as they are associated with least complications such as extrusion, and resorption.⁶ The main drawback of using costal cartilage block is that it warps in due course of time.⁷

Certain maneuvers have been described to prevent or reduce warping. These include cartilage carving or scoring as described by Nuara et al, who demonstrated good outcomes.⁸ Another technique is the use of diced cartilage instead.⁹⁻¹⁰ Diced cartilage provides support, without the potential for warping. However in thick Asian skin diced cartilage alone is often insufficient to provide adequate structural support.

This study aimed to evaluate the results of a combination of costal cartilage block and diced cartilage for nasal augmentation in type-4 saddle nose deformity.

Methodology

This study was conducted at Department of Plastic Surgery, Mayo Hospital Lahore from 1st March 2019 to 29th Feb 2020, using a non-probability, consecutive sampling method. All patients presenting in the mayo hospital outpatient department, aged between 20 and 40 years were included irrespective of gender. Patients with type IV saddle nose with no prior corrective treatment were included. Those with a history of radiation therapy in the region were excluded. The sample size was calculated as 60 by keeping the confidence interval equal to 95% with an 8% margin of error. Assessment was done in the immediate post-operative period and at 1 year by a senior plastic surgeon for cartilage warping and recurrence of saddle nose.

In this study, dorsal deviation/warping were defined as the presence or absence of deviated dorsal aesthetic lines. Recurrence of saddling was recorded if the saddle shape reappeared.

After taking informed consent, demographic data (i.e. age and gender) was collected and entered on a pre-designed chart. The cases under-went open rhinoplasty. Septoplasty was done and nasal dorsum augmentation done by using both the diced and the block cartilage. These cases were followed up for 12 months for nasal dorsum deviation/warping, and recurrence. All the results were recorded on the patient’s chart.

The data was entered and analyzed by using SPSS-23. Quantitative variables were presented as mean ±SD. Qualitative variables were presented as frequencies

and percentages. Effect modifiers were controlled through stratification of age and gender. Post stratification chi-square test was applied and p 0.05 was taken as significant.

Results

A total of 60 patients were enrolled. Out of the 60 patients included in our study, 16 (26.7%) were females and 44 (73.3%) were males. Patients between ages 20-30 were 53 (88.3%) and between ages 31-40 were 7 (11.7%), as shown in Table 1.

The cause of saddle nose was post traumatic in 55 (91.66%), post infectious in 2 (3.3%) and iatrogenic in 3 (5.0%) patients (Table 2). No correlation was observed between age, sex or mode of trauma and the degree of warping.

Dorsal deviation/ warping was seen in 5(8.3%) patients and recurrence was seen in 5 (8.3%) patients at 1 year follow-up (Table 3). No correlation was observed between age, sex or mode of trauma and the degree of warping.

Post-operative swelling was seen in 9 (15%) patients and post-operative bruising was seen in 7(11.7%) patients. In all the patients, swelling settled on its own within a month. Bruising settled in two to three weeks. Infection was seen in 2 (3.3%) patients which settled with oral antibiotics at 2 weeks and graft extrusion was seen in 1 (1.7%) patient only in early post-operative period. In addition, contour irregularity was also seen in 2 (3.3%) patients. None of the patients had donor site complications (see Table 4)

Figures 1,2 and 3 show pre-and post-operative pictures of a few representative cases.

Table 1: Demographic Characteristics of the Patients

Variable	Frequency	Percentage
Age (in year)		
20-30	53	88.3
31-40	7	11.7
Gender		
Male	44	73.3
Female	16	26.7

Table 2: Causes of Saddle Nose

Causes	Frequency	Percentage
Trauma	55	91.66
Infection	2	3.3
Iatrogenic	3	5.0

Table 3: Outcomes of Our Study

Variable	Frequency	percentage
Dorsal deviation	5	8.3
Recurrence	5	8.3

Table 4: Other omplications encountered in the patients

Complication	Frequency	Percentage
Post-operative swelling	9	15
Post-operative bruising	7	11.7
Infection	2	3.3
Contour irregularities	2	3.3
Graft extrusion	1	1.7

problem of warping with time.

In our study we evaluated the results of nasal dorsal



Figure 1(A): pre and post-operative Frontal view of Nose.



Figure 1 (B): pre and post-operative Lateral Views of nose.

Figure 1(c) : pre and post-operative basal views of Nose



Figure 2 (A): pre and post-operative Frontal views of Nose



Figure 2 (B): the pre and post-operative lateral view

Figure 2 (c) : pre and post-operative Basal views



Figure 3 (A): pre and post-operative Frontal view of nose



Figure 3 (B): pre and post-operative lateral views

Figure 3(c) : pre and post-operative basal views of nose

Discussion

Saddle nose is a universally prevailing deformity. The most frequent cause of this disfigurement remains prior trauma to nose, and we found the same in our results. Type 4 saddle nose deformity is especially challenging as it has both functional and aesthetic concerns and requires restoration of anatomical landmarks. Autologous costal cartilage has been used most frequently for correction of saddle nose, but it has the

augmentation using a combination of autologous costal block overlaid with diced cartilage. We found that the combination was effective in nasal dorsum augmentation with decrease in warping. In our study, dorsal deviation/warping was seen in 5 (8.3%) of the patients, which is lower than documented in literature⁷. Our study showed the recurrence rate 8.3% (5 out of 60 patients) which is comparable to the study by velidedeoglu et al in which the recurrence using block and surgicell-wrapped diced

cartilage was 9.6% (5 out of 52 patients).¹¹ One patient in our study experienced graft extrusion. This patient had very thin and scarred skin. In our study, post-operative swelling was seen in 9 (15%) patients and post-operative bruising was seen in 7 (11.7%) patients which is comparable to most of the studies.^{8-10,12}

Advancing further on the technique of using diced cartilage, many authors have described different ways to use it. Fascia-wrapped diced cartilage was popularized by Daniel and it provided excellent even contour, but it needed additional donor area for harvesting of fascia.^{9,10} Cerkes and Basaran proposed the use of diced cartilage wrapped in rectus abdominis fascia in 109 patients.¹² He obtained satisfactory results and fairly acceptable complication and revision rates. Five patients had insufficient augmentation. Using autologous glue comprising of fibrin and PRP, and combining it with diced cartilage was introduced by Bulloks et al. It is costly but has great flexibility as it provides scaffold to diced cartilage¹³. In this prospective study of 68 patients, the dorsal height was maintained and there was no major complication related to diced cartilage.

The use of unwrapped diced cartilage packed in stainless steel syringe has been described by Erol for minor contour irregularities. It can easily be molded with finger manipulation and it can overcome the problem of warping and cartilage graft visibility.¹⁴ In our study, we have used the unwrapped diced cartilage and transferred it into nose with 1cc syringe using a modified suction assisted technique as described by Bashir MM et al¹⁵ in their study. The technique uses an intravenous cannula fitted within the nasogastric tube and connected to a suction machine. It has better ease of filling.

Our study utilized the benefits of both block and diced cartilage. In our experience, favorable results are achieved by combination as the block cartilage provides solid dorsal support and augmentation, whereas the diced cartilage camouflages any subsequent warping, block show and irregularities in carving. The diced cartilage also smoothens out the sharp edges of costal cartilage. As we did not use any wrapping material the added morbidity of infection due to foreign body and unsightly scar/scar alopecia was also removed. Nonetheless, harvesting costal cartilage and its precise carving is cumbersome. Also, dicing the cartilage is a long and tedious process.

The limitations of this study are that it is conducted at

a single center. Objective parameters for quantification of warping and augmentation were not employed. The assessment of outcome was done by a single surgeon. Future studies shall be targeted to obviate these limitations.

Conclusion

In conclusion, our technique using combination of block and diced cartilage is efficacious. It was satisfactory both for operating surgeon and the patient. It is safe and easily reproducible. It has satisfactory aesthetic and functional outcomes.

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