



ORIGINAL ARTICLE

Nose dorsum augmentation with diced cartilage graft versus Block cartilage graft in mild saddle nose.

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ABSTRACT... Objective: To compare the aesthetic results of diced cartilage and block cartilage when they are both use for nose dorsum augmentation in mild saddle nose deformity. **Study Design:** Retrospective Comparative study. **Setting:** Department of Plastic Surgery, Liaquat National Hospital, Karachi. **Period:** January 2017 to December 2019. **Material & Methods:** Two groups selected for this procedure diced graft (n=11) and segment cartilage graft (n=13), total 24 patient. Retrospective data of these patient were analyze, aesthetic outcome recorded as fair, good and excellent on remark of two plastic surgeon (blinded to graft placed) not involve in surgery by pre and postoperative picture at last follow up and patient satisfaction via S-VAS recorded. Average follow up was 6 months. **Results:** Aesthetic outcome of dice cartilage graft versus block cartilage graft are excellent in 81.8% versus 76.9 %, good 9% versus 7.6%, fair 9% versus 15% respectively. Patient satisfaction grade extremely satisfied 72.7% versus 69.2%, satisfied 27.2% versus 30.7%, no patient was unsatisfied. **Conclusion:** Our clinical experience support that the free diced cartilage graft technique presents an effective and easily reproducible method for nose dorsum augmentation in aesthetic and reconstructive rhinoplasty for mild saddle deformity.

Key words: Block Cartilage, Diced Cartilage, Rhinoplasty, Saddle Nose.

INTRODUCTION

In aesthetic rhinoplasty and nasal reconstruction in post-traumatic and congenitally deformed nose, nasal dorsum augmentation plays a vital role. To attain a cosmetically pleasing outcome while making facial harmony is the ultimate goal. There are many different cartilage grafts, from different sites of body different techniques to implant a graft.¹ Each of these grafts and its technique has different advantages and disadvantages, and none has complication-free records. Several different techniques have been described in the literature. Many clinical and experimental studies have been done but none of them provided sufficient results due to diverse reasons.

Various article references different materials for implants but many authors favor autogenous grafts because of its biocompatibility and low risk of infection but still they have their own complications and difficulties.²⁻⁴ For this reason

we are using autogenous cartilage grafts and using two different techniques that is diced or block cartilage graft. The cartilage harvesting technique, for example getting from rib, concha or septum are effective but they are associated with various donor and recipient-site morbidity. The complications that are common in cartilage grafts include warping, misalignment, visible distortion, infection and poor overall aesthetic result.^{5,6} Harvesting a single fragment of cartilage produces forces of torque that affect the balance in native nasal cartilage leading to deformities.⁷ So, the idea of diced cartilage was formed which was published by Erol. The idea behind diced cartilage was it can mould easily and produces a smooth contour under the skin of the patient, but still issue of graft absorption remains in this technique as reported in literature.⁸ Saddle nose deformity is described by columellar retrusion, vault widening and depression and nasal shortening with tip over rotation that results from

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basal support disruption.⁹ In rhinoplasty, most common encountered deformity is saddle nose but still remains the most challenging deformities to correct.

In this study compared two different techniques of graft placement which includes block cartilage and diced cartilage and comparing their outcomes according to patient's satisfaction as this study has never been done before. Both techniques have their own advantages and disadvantages but through this study we will evaluate what's the best technique for the patient's satisfaction.

MATERIAL & METHODS

The study was conducted in Department of Plastic Surgery, Liaquat National Hospital, Karachi. After IRB approval (0790-2021 LNH-ERC) the study includes 24 patients who underwent augmentation rhinoplasty from January 2017 to December 2019. Main reason for rhinoplasty was mild saddle nose deformity. Main surgical techniques used to address them was block cartilage and diced cartilage. Other reasons for rhinoplasty and other surgical procedures were also done but will not be address in this report.

Both diced and block cartilage grafts were taken from rib cartilage with same harvesting technique across all patients for the purpose of this study.

Patients were divided in to two groups, in which group A (n=13) was block cartilage group and group B (n=11) was diced cartilage group. The selection of either Group A or Group B depended on etiology, clinical examination of nose, skin condition of nose either thin or thick, patient needs, photographic views and discussing about the technique with the patient in detail. These discussions included pros and cons of both techniques, expected complications, protocols in post-operative period and rate of success and failure reported in literature.

In all 24 cases open rhinoplasty was done. Post operatively nasal packing was done and nasal splints were applied. These were removed as per the mentioned protocol.

Analysis of photographic views done for adequate augmentation rates evaluation at preoperative, early post-operative and late post-operative stages. For patient's satisfaction assessment, patients were subjected with primary and secondary questionnaire during early and late post-operative period which took into account both functional and aesthetic outcome of surgery. The improvement in breathing was the functional outcome while satisfactory or dissatisfactory was asked about the cosmetic outcome of surgery. Early post-operative period ranges from 5-6 months and late post-operative period ranges from 12-18 months.

Patients were asked how they feel about the appearance of their face and nose during early post-operative period while taking edema, erythema and swelling into account. The secondary questionnaire was more focused on aesthetic results of the procedure. We also used the expertise of two plastic surgeons working outside of our hospital to avoid biasness and asked them to rate our procedures as good or fair without knowing which one received the block cartilage and which received the diced one.

All the data were quantified and expressed as numbers or percentages and statistical analysis was done using SPSS v.25. The comparisons between the groups were done using fisher's exact t-test and p-value less than 0.05 was considered significant.

RESULTS

The early post-operative data did not show any evidence of superiority to any technique may be due to the fact of edema, swelling or erythema. And all of these were managed with good results in both the groups. The functional outcome, however proved to be improved significantly as a non-cosmetic outcome if present primarily. In early post-operative period the only complication we faced was nasal deviation in one patient in both the groups. Nasal deviation in diced cartilage group was due to improper splint placement in 1st week of post-operative period. Digital manipulation corrected this complication in diced cartilage group but it had no effect on

block cartilage group.

All the methods including questionnaire, photographic views and expertise from other plastic surgeons proved to be a reliable tool of assessing patient's satisfaction by identifying a significant difference between the pre and post-operative period. Patients in both groups experienced significant improvement in appearance and nasal function. Evaluation of photographic evidence from both pre and post-operative period showed significant differences in the outcome with better augmentation rates in diced group (Fig-1). Most of the unsatisfactory results were found to be block cartilage group including two patients having nasal deviation, two cases of cartilage visibility, one case of partial resorption of cartilage while one case of complete resorption of cartilage leading to redo rhinoplasty. The dissatisfaction rate in block cartilage group was 33.3% while 1% in other group.

Two plastic surgeons rated "good" outcome in 88% of diced cartilage group while 66% of the population in block cartilage group were labeled as "fair" results.

According to surgeons and patients comments altogether with photographic assessment, results of satisfaction and dissatisfaction were made. In whole population 88% were satisfied and remaining patients asked for revision rhinoplasty. In Group B, 99% of the population was satisfied with the result and in Group A 66% were satisfied with the outcome, having p-value of 0.03. Age or gender was not related to satisfaction.

Groups (n)	Satisfaction n (%)	Dissatisfaction n (%)	P-Value
Group A (13)	(66%)	(34%)	0.031
Group B (11)	(99%)	(1%)	
Total (24)	(88%)	(22%)	

Table-I. showing groups of patient and level of satisfaction

Patient	Age	Etiology	Augmentation	Early result	End result
1	29	Mild saddle	Diced cartilage	Good	Good
2	19	Mild saddle	Diced cartilage	Good	Good
3	18	Mild saddle	Diced cartilage	Good	Good
4	23	Mild saddle	Diced cartilage	Good	Good
5	34	Mild saddle	Diced cartilage	Deviated	Good
6	22	Mild saddle	Diced cartilage	Good	Good
7	23	Mild saddle	Diced cartilage	Good	Good
8	25	Mild saddle	Diced cartilage	Good	Good
9	24	Mild saddle	Diced cartilage	Good	Good
10	33	Mild saddle	Diced cartilage	Good	Good
11	30	Mild saddle	Diced cartilage	Good	Resorption
12	26	Mild saddle	Block cartilage	Good	Good
13	23	Mild saddle	Block cartilage	Good	Good
14	27	Mild saddle	Block cartilage	Good	Good
15	19	Mild saddle	Block cartilage	Good	Good
16	25	Mild saddle	Block cartilage	Deviated	Good
17	28	Mild saddle	Block cartilage	Good	Good
18	23	Mild saddle	Block cartilage	Dark skin	Deviation
19	25	Mild saddle	Block cartilage	Erythema	Deviation
20	20	Mild saddle	Block cartilage	Erythema	Visibility
21	26	Mild saddle	Block cartilage	Good	Resorption
22	20	Mild saddle	Block cartilage	Good	Good
23	22	Mild saddle	Block cartilage	Good	Good
24	24	Mild saddle	Block cartilage	Good	Good

Table-II. showing patient's characteristics, technique used for augmentation and results



Figure 1: Showing preoperative and postoperative results of saddle nose correction with diced cartilage.

DISCUSSION

The results drafted from our experience suggests the superiority of dorsal augmentation in patients with mild saddle nose using diced cartilage graft, similar results were demonstrated by Bullocks et al.,¹ The block cartilage graft group review showed that this group had low patient and surgeon satisfaction rates as failure to do minor adjustment with digital manipulation in the block graft group was unattainable, hence minor touch up surgeries might be needed in this group. Both early and late results revealed that diced cartilage group had overall better outcomes and satisfaction rates.

Splinting was done in all cases and post-operative care was standardized, so as to minimize the patient related factors affecting our results. Despite that, a few had complications including deviation, cartilage visibility, and cartilage resorption.

The diced cartilage technique facilitated the correction of deviation which was not possible in the other study group. Other complications reported in our study are among the ones mentioned in the literature.

Questionnaire and photographic comparison based evaluation by patient was done regarding satisfaction was done. This showed that except a few, majority patients were satisfied with the post-operative outcome in means of appearance as well as function. Statistical analysis showed a p-value of 0.031 which was significant, suggesting the high satisfaction rate in diced cartilage group.

All patients were evaluated by two plastic surgeon as a third party review. Eighty eight percent “good” results were achieved in the diced cartilage group and only 66% “fair” results in the block cartilage group. et al., in their study also published a similar comparison, signifying superiority of the diced cartilage over block cartilage in rhinoplasty for dorsal augmentation.

CONCLUSION

Based on our results and literature, we recommend and prefer the used of diced cartilage in rhinoplasty for dorsal augmentation in patients with mild saddle nose.






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REFERENCES

1. Bullocks JM, Echo A, Guerra G, Stal S, Yuksel E. **A novel autologous scaffold for diced-cartilage grafts in dorsal augmentation rhinoplasty.** *Aesthetic PlastSurg.* 2011; 35:569-579.
2. Adams JS. **Grafts and implants in nasal and chin augmentation: A rational approach to material selection.** *OtolaryngolClin North Am.* 1987; 20:913-930.
3. Ahn J, Honrado C, Horn C. **Combined silicone and cartilage implants: augmentation rhinoplasty in Asian patients.** *Arch Facial PlastSurg.* 2004; 6:120-123.
4. Dancey AL, Perry MJ. **Late presentation of alloplastic implant extrusion.** *PlastReconstrSurg.* 2004; 113:1081-1082.
5. Calvert JW, Brenner K, DaCosta-Iyer M, et al. **Histological analysis of human diced cartilage grafts.** *PlastReconstr Surg.* 2006; 118:230-236.
6. Daniel RK, Calvert JW. **Diced cartilage grafts in rhinoplasty surgery.** *PlastReconstr Surg.* 2004; 113:2156-2171.
7. Fatemi MJ, Hasani ME, Rahimian S, Bateni H, Pedram M, Mousavi SJ. **Survival of block and fascial-wrapped diced cartilage grafts: An experimental study in rabbits.** *Ann Plast Surg.* Sep 2012; 69(3):326-30. doi: 10.1097/SAP.0b013e3182275d6a. PMID: 21750454.
8. Kelly MH, Bulstrode NW, Waterhouse N. **Versatility of diced cartilage-fascia grafts in dorsal nasal augmentation.** *PlastReconstr Surg.* 2007; 120:1654Y1649; discussion 1654-1959.

9. DyerWK II, Beaty MM, Prabhat A. **Architectural deficiencies of the nose: Treatment of the saddle nose and short nose deformities.** OtolaryngolClinNorth Am. 1999; 32(1):89-112.
10. Daniel RK. **Rhinoplasty: Septal saddle nosedeformity and composite reconstruction.** PlastReconstr Surg. 2007; 119(3):1029-1043.

AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
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2	Shehab Afzal Beg	Concept of article, Final approval.	
3	Hassan Tahir	Data analysis and interpretation.	
4	Osama Ahmed Qureshi	Data collection.	
5	Touqeer Hussain	Data analysis.	
6	Remsha Sattar	Data collection.	