

ORIGINAL RESEARCH

Autologous Fat Injection Technique for facial Contour Deformity - Evidence from a Tertiary Care Centre in Tamilnadu, India

Dr K.P. Ganesh Kumar^{1*}, Dr M. Menaga²

^{*1}Assistant Professor, Department of Plastic Surgery, Government Dharmapuri Medical College, Dharmapuri, India.

²Associate Professor, Department of Community Medicine, Government Dharmapuri Medical College, India.

Corresponding Author

K.P. Ganesh Kumar

Assistant Professor, Department of Plastic Surgery, Government Dharmapuri Medical College, Dharmapuri, India

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ABSTRACT

Background: As a part of facial rejuvenation, one shall correct facial volume loss. For facial volume restoration one of the many interventions is autologous fat injection. It is biocompatible, cost effective and high in availability. Based on this objective of our study is to show the real evidence of volumetric contour correction using autologous fat injection. **Methods:** The present study was a descriptive study carried out in the department of plastic surgery of a tertiary care hospital in Tamilnadu, India. The study was carried out for a period of 6 months. Informed consent was obtained from all the participants included into the study after explaining the complete study procedure. The data was collected using a semi-structured proforma. Descriptive statistics were used to describe the data collected during the study. Qualitative variables were described using frequency and percentages. **Result:** The site in injection were malar and periorbital region in 9 (75%), nasolabial fold in 2 (16.7%) and angle/body of mandible in 1 (8.3%). 7 (58.3%) were of age 20 to 29 years followed by 4 (33.3%) of age 30 to 39 years. 1 (8.3%) of age more than 39 years. 2 (16.7%) participants had resorption of the graft and for them second fat transferring was done which was successful. 11 (91.7%) were satisfied with the outcome of the procedure. **Conclusion:** Autologous fat grafting is reliable, safe and a non-invasive procedure that could aid in volumetric face lifting. The proportion of patient satisfied with the outcome was on the higher side and for those in whom initial resorption happened additional grafting had led to a successful outcome.

Key words: Volume loss, autologous fat grafting, volumetric face lifting, satisfaction, complication, effectiveness, success rate.

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INTRODUCTION

Facial rejuvenation is cosmetic procedure aims at restoring the youthful appearance of human face. It involves a series of treatments either surgical or non-surgical¹. The cornerstone of facial rejuvenation involves lifting of the soft tissue and redraping procedures². As a part of facial rejuvenation, one shall correct facial volume loss³.

One of the reasons for facial volume loss is the ageing process itself⁴. Facial aging is said to be the end result of interaction between multiple processes. It involves not only structural changes but also volumetric changes of skin, adipose components, muscle and skeleton⁵. It was reported that the sagging of facial tissues could be due to either diminution or repositioning of adipose compartments^{6,7}.

For facial volume restoration one of the many interventions is fat grafting. The various types of fat grafting involve structural fat grafting⁸, complement fat grafting⁹, fat autologous muscular injection¹⁰, fat rebalancing¹¹ and sequential autologous fat injection¹². Of all the techniques listed above sequential autologous fat injection (SAFI) leads to volumetric lifting. In autologous fat injection technique, the fat will be injected into the supra-periosteal layer. The volumes of fat injected will differ between the superficial and deep layers. The volume injected into the deep layer will be more than that injected in the superficial ones. The two advantages of autologous fat injection involve improvement in soft tissue deficiency and skeletal deformity^{13,14}.

The present study was carried out mainly to provide evidence of volumetric contour correction using autologous fat injection. Only fewer studies with similar objectives were performed in the study setting. The present study will throw a light on the utilization of the intervention and its effectiveness.

MATERIALS AND METHODS

The present study was a descriptive study carried out in the department of plastic surgery of a tertiary care hospital in Tamilnadu, India. The study was carried out for a period of 6 months. Informed consent was obtained from all the participants included into the study after explaining the complete study procedure. The data was collected using a semi-structured proforma.

A modified version of Coleman's method was used for harvesting and purification⁸. Following consent, harvesting of the fat was performed. In the region of harvesting, was injected a local anaesthetic agent, a combination of lidocaine (0.5%) and epinephrine (0.0005%). After 15 minutes of duration, from the harvesting area a stab incision was made and using a syringe with blunt tip canula of 2.1 to 2.4 mm and using a negative pressure of 0.75 to 1 atm.

Under local anaesthesia, after processing the harvested fat were then injected into the desired site. A 1cc insulin syringe was used for the procedure and were fitted with blunt cannulas of around 0.7 to 1.2 mm tip. All the fat were injected into the soft tissue but in different layers. 60% gets injected into the supra-periosteal layer, 30% into the deep fat layer and 10% into the superficial fat layer. Injecting fat in the above manner will provide both skeletal support and will aid in restoring the lost soft tissue volume.

Descriptive statistics were used to describe the data collected during the study. Qualitative variables were described using frequency and percentages

RESULT

All the 12 cases performed during the study period was for an aesthetic purpose. The causes for treatment were malar flattening in 9(75%), deep nasolabial fold in 2 (16.7%) and mandibular asymmetry in 1 (8.3%). The site in injection were malar and periorbital region in 9 (75%), nasolabial fold in 2 (16.7%) and angle/body of mandible in 1 (8.3%) (Table 1). Table 2 describes the summary of each participant included into the study.

Table 1: Distribution according to site of injection of autologous fat

Variables		Number of cases (n=12)	Percentage (%)
Causes	Malar flattening	9	75.0
	Deep nasolabial fold	2	16.7
	Mandibular asymmetry	1	8.3
Site of injection	Malar and periorbital region	9	75.0
	Nasolabial fold	2	16.7
	Angle and body of mandible	1	8.3

Table 2: Summary of the study participants

S.No	Age	Sex	Site of Injection	Amount of augmentation	Complication	Corrective	Patient Satisfaction
1	21	F	Malar	30 ml	No	No	Yes
2	24	F	Nasolabial fold	20 ml	No	No	Yes
3	40	F	Malar	40 ml	No	No	Yes
4	32	F	Malar	35 ml	Yes*	Second fat transferring	Yes
5	25	F	Angle and body of mandible	21 ml	No	No	Yes
6	28	F	Malar	30 ml	No	No	Yes
7	31	F	Malar	35 ml	No	No	Yes
8	29	F	Malar	21 ml	No	No	Yes
9	21	F	Malar	30 ml	No	No	Yes
10	27	F	Malar	30 ml	Yes*	Second fat transferring	Yes
11	36	F	Malar	40 ml	No	No	No
12	31	F	Nasolabial fold	20 ml	No	No	Yes

*Resorption

7 (58.3%) were of age 20 to 29 years followed by 4 (33.3%) of age 30 to 39 years. 1 (8.3%) of age more than 39 years. 2 (16.7%) participants had resorption of the graft and for them second fat transferring was done which was successful. 11 (91.7%) were satisfied with the outcome of the procedure (Table 3).

Table 3: Distribution according to age, complication, corrective and patient satisfaction

Variables		Frequency (n=12)	Percentage (%)
Age distribution (in years)	20-29	7	58.3
	30-39	4	33.3
	>39	1	8.3
Complication	Yes	2	16.7
	No	10	83.3
Corrective	Yes	2	16.7
	No	10	83.3
Patient satisfied	Yes	11	91.7
	No	1	8.3

DISCUSSION

As a part of facial rejuvenation, one shall correct facial volume loss³. For facial volume restoration one of the many interventions is fat grafting^{8,9,10,11,12} Neuber in the year 1893 demonstrated successful free fat transplantation¹⁵. Hollander was the first to introduce cannula for the procedure¹⁶. Coleman in the year 1990 introduced centrifuge for processing the graft⁸.



Figure 1: Before and after images –after autologous fat injection

The advantages of using autologous fat graft were its biocompatibility, its availability in large amounts, the cost-effective nature of the procedure and the results were long lasting in relative to the rest of the fillers available¹⁷. The other advantages of autologous fat injection involve improvement in soft tissue deficiency and skeletal deformity^{13,14}. The one of the disadvantages of fat grafting will be the ability of the graft to undergo atrophy or hypertrophy. Some articles had advised care to be taken while performing the harvesting where it shall be done with minimal tissue trauma. Fat processing is another step where extreme care shall be taken as it will determine the fat cells' survival^{18,19}.



Figure 2: Before and after images –after autologous fat injection

The present study was carried out mainly to provide evidence of volumetric contour correction using autologous fat injection. It was a descriptive study carried out in a tertiary care hospital in Tamilnadu. In the present study, 16.7% participants had resorption of the graft and for them second fat transferring was done which was successful. 91.7% were satisfied with the outcome of the procedure. Results similar to the present study was reported by Khorasani M and Janbaz P. The study reported 93% to be completely satisfied with the outcome. The proportion of complication in the study was about 13%²⁰. Xie et al reported that in order to obtain a long-term outcome not one but up to three injections were required and the satisfaction rate among the participants was 73.5%²¹.

The present study demonstrated that autologous fat injection can lead to both volumetric lifting effect and adequate skeletal support. But the result of the study cannot be generalised as it was performed in small number of participants and only in one centre. The follow-up of the participants is also relatively short. What is recommended is a similar study with large number of participants including many centres and a longer follow up period will provide a more generalisable result. The present study

nevertheless had thrown a light on the ability of autologous fat grafting as a face rejuvenation procedure leading to volumetric face lifting.

CONCLUSION

Autologous fat grafting is reliable, safe and a non-invasive procedure that could aid in volumetric face lifting. The proportion of patient satisfied with the outcome was on the higher side and for those in whom initial resorption happened additional grafting had led to a successful outcome.

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