Free Dermal Fat Graft for Restoration of Soft Tissue Defects in Maxillofacial Surgery

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Received: 14 September 2011 / Accepted: 1 March 2012 / Published online: 25 April 2012
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Abstract Various local flaps have been used for reconstruction of developmental and post surgical soft tissue defects of maxillofacial region. They include nasolabial flap, palatal pedicled flap, buccal fat pad, temporalis muscle and fascia flap. An ideal flap for all indications is yet to be found. Our experience with free dermal fat graft in the correction of deformities associated with Parry Romberg syndrome and oral submucous fibrosis is presented.

Keywords Soft tissue defects · Dermal fat graft · Parry romberg syndrome · Hemifacial atrophy · Oral submucous fibrosis · Soft tissue reconstruction

Introduction

Soft tissue reconstruction is frequently required in maxillofacial surgery in the correction of developmental, post traumatic and post surgical defects. Even though various materials for soft tissue reconstruction have been used since ages, an ideal restorative material is yet to be found. The different materials used include autologous tissue like local flaps, pedicled flap and free vascularised flaps; and allografts like collagen, hyaluronic acid and alloderm. Even though free vascularised flaps have become the gold standard today, it is not easily available at every maxillofacial center and is not indicated for small defects. Among

the local flaps, the nasolabial flap and buccal fat pad have been widely used, their important limitation being the restriction in mobility of the flap; the volume and shape of material available. Pedicled flaps are not routinely used in reconstruction of minor soft tissue defects. Dermal fat graft has been used successfully in our centre for reconstruction of minor soft tissue defects of the maxillofacial region. The advantages include the availability of adequate amount of tissue, lack of morbidity and the excellent adaptability of the tissue to the donor site. The presence of the dermal component makes suturing very precise.

Materials and Method

The study was carried out on all patients reporting to CMDC (WC) requiring soft tissue reconstruction of minor defects of maxillofacial region (Table 1). Patients suffering from hemifacial atrophy (Fig. 1) were not taken up till 1 year follow up showed inactive disease. Patients with oral submucous fibrosis (OSMF) were motivated to stop all deleterious habits before taking up for surgical correction. Patients with maximal interincisal opening (MIO) of less than 20 mm were taken up for surgical correction.

Patients were admitted 1 day prior to surgery. Preoperatively Inj Omnatax 1 g IV was given in all cases half an hour before surgery along with Inj Dexamethasone 8 mg. All cases were undertaken under general anesthesia with nasal endotracheal intubation. Awake fiberoptic intubation was carried out in cases of OSMF. The recipient bed was prepared as per standard protocol. In cases of OSMF, fibrotomy followed by coronoidectomy were carried out to achieve a maximum interincisal opening (MIO) of 40 mm intra operatively. In cases of hemifacial atrophy, facelift incision was used to prepare the recipient site. The

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Table 1 Types of cases treated using this technique

Sl No.	Type of case	No. of cases
1	Hemifacial atrophy	2
2	Oral submucous fibrosis	3
Total		5

Fig. 1 Preoperative photograph showing atrophy of left side of lower half of face

plane of dissection was maintained at a superficial sub dermal level to allow good contact of the graft with the sub dermal vascular plexus. Dissection was extended 1 cm beyond the defect margins.

Donor site was marked preoperatively on the Rt flank above the iliac crest level. Free dermal graft was harvested with an elliptical incision with a length to width ratio of 3:1 to achieve tension free primary closure (Fig. 2). Graft was de-epithelised in situ before harvesting. Care was taken to maintain the thickness of fat to 1.5 cm. In cases of OSMF, graft was harvested as two elliptical portions. The donor site was undermined, irrigated well with normal saline; hemostasis achieved and closed in two layers. Pressure dressing was maintained for 2 days.

Fig. 2 Intraoperative photograph showing harvest of graft **Fig. 3** Intraoperative photograph showing graft sutured to the recipient site **Fig. 4** Intraoperative photograph showing graft sutured to the recipient site

After trimming the grafts to the contours of the recipient site and tapering the margins, the graft is inserted into the recipient site with the dermal surface facing the skin and sutured around the margins to give a tight adaptation to the defect with 3-0 vicryl sutures (Figs. 3, 4). The graft is left 25 % thicker than required to compensate for volume loss during healing. The recipient site is closed in layers and pressure dressing given. Antibiotics were continued for the next 5 days.

The treatment was considered successful if an MIO of 30 mm was achieved post-operatively in cases of OSMF and if both patient and the surgeon was happy with the esthetics postoperatively in cases of Parry Romberg syndrome.

Results

All cases were followed up for 18 months. None of the cases developed complication postoperatively. One patient developed hypertrophic scar both at the recipient and donor

Table 2 Preoperative and postoperative MIO of patients with OSMF

Sl No.	Age	Sex	Preoperative MIO (mm)	Postoperative MIO (mm)
1	32	F	12	38
2	45	M	10	32
3	28	M	13	40
4	48	M	5	35
5	42	F	16	35

Fig. 5 Postoperative photograph 18 months post op **Fig. 6** Postoperative photograph of a case of oral submucous fibrosis patient showing excellent function 6 months post op

sites. In cases with OSMF, MIO of minimum 30 mm was achieved post operatively (Table 2). In cases of hemifacial atrophy, some degree of volume loss was seen in one case. However, the patient was happy with the result. All cases had satisfactory appearance post surgery in cases of hemifacial atrophy (Fig. 5) and function in cases of OSMF (Fig. 6).

Discussion

Although fat transfer to correct facial soft tissue defects has become very popular recently, the concept of autologous fat transfer is not something new. It was reported as early as 1893 [1]. Free abdominal fat was used to correct malar and chin defects for the first time in 1909 [1] which was followed by several others [2–7]. However, the technique did not gain popularity because of two reasons—the propensity to form epithelial cysts and the unpredictable resorption post operatively. Other techniques of soft tissue reconstruction included various regional and local flaps [8–17]. With the refinement in the technique of free dermal fat grafting these complications have become insignificant and thus made free dermal fat grafting a popular method of restoration of soft tissue defects of the maxillofacial region. The advantages of fat as a reconstruction material include their biocompatibility; they remain supple, are relatively resistant to infection and accommodate facial growth. They also can be easily harvested with adequate volume and minimal morbidity and can be readily contoured to fit any defect.

Conclusion

Free dermal fat graft is a very useful restorative material to reconstruct facial defects of size ranging from 2 to 10 cm with minimum morbidity. Careful patient selection and gentle handling of the graft are few of the essential prerequisites for long term success.

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