

Fat and Dermo-Fat Grafting as A Safe and Simple Solution for Management of Facial Atrophy

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ABSTRACT

Facial atrophy is found in various situations as trauma, HIV, Parry-Romberg syndrome and others. Many procedures were used to manage facial tissue atrophy.

26 patients with facial atrophy were managed, 14 cases were managed with autologous fat transplantation and 12 cases were managed with dermo-fat grafting.

Results were good with 3 cases with hematoma and ecchymosis, 2 cases under-correction and 2 cases with induration and with overall patient satisfaction in 22 cases.

To conclude, cases with facial tissue atrophy grade I and II can be managed with autologous fat transplantation, cases with grade III can be managed with dermo-fat grafting, while cases with grade IV facial atrophy need in addition to fat grafting, other techniques as dermo-fat graft, galeal flap, free flaps or cartilage and bone graft.

INTRODUCTION

Facial atrophy may occur unilaterally or bilaterally. Bilateral facial atrophy is found in various situations such as trauma, HIV infection [1]. Facial hemi-atrophy is seen after trauma, parry-Romberg syndrome and on other rare occasions [2].

Progressive facial hemi-atrophy (PFH), or parry-Romberg syndrome, is a syndrome characterized by localized and progressive atrophy of the skin and subcutaneous tissues of the face, and usually it affects one or more trigeminal dermatomes. The syndrome was found by Parry in 1825 and described by Romberg in 1846 [3]. The disease usually begins between the ages 5 and 15 years. The progression of the atrophy often lasts from 2 to 10 years and then it enters a stable phase [4]. When PFH occurs in children, it usually impairs bone growth of the orbit and jaw. The extension of the atrophy is frequently unilateral in the face, although rare

bilateral cases have been reported. The possible causes of this syndrome include: Viral infections, trauma, autoimmunity and heredity. It is more common in females than in males. The range and severity of this syndrome may vary from case to case. In mild cases, there is only an aesthetic disfigurement, whereas in severe cases, the hemifacial atrophy is accompanied by neurological abnormalities including seizures and episodes of severe trigeminal neuralgia [5].

Improving the volume and contour of faces with tissue atrophy offers a great psychological and emotional improvement of the patients. Plastic surgeons need to choose the most appropriate surgical management for correction of these facial deformities. The use of autologous fat grafting as a solitary procedure or together with other surgical methods offers a very valuable solution for these patients with facial atrophy [6].

PATIENTS AND METHODS

Between December 2006 and January 2010, twenty six patients with facial atrophy were managed. 16 patients were females and 10 patients were males. The mean age of the patients was 30 years (range 20-40 years). Ten patients were complaining of unilateral facial atrophy, five patients of them were complaining of posttraumatic (maxillofacial or neurosurgical trauma) hemifacial atrophy [3 patients were managed with autologous dermo-fat grafting, while 2 patients were managed with autologous fat transplantation]. And the other five patients were complaining of unilateral hemifacial atrophy due to Parry-Romberg syndrome [3 patients were managed with autologous dermo-fat grafting while 2 patients were managed with

autologous fat transplantation] (Table 2). Cases with Parry-Romberg syndrome were classified according to the degree of facial atrophy into IV grades (Table 1), and in this study there were 2 cases with grade II and 3 cases with grade III.

Sixteen patients were complaining of bilateral facial atrophy as a part of decreased subcutaneous fat all over the body with decreased body weight (after failure of diet programs to increase body weight), six patients of them were managed with autologous dermo-fat grafting, while ten patients were managed with autologous fat transplantation (Table 2).

The dermo-fat graft was taken from the anterior abdominal wall below the umbilicus and then transplanted to the face through a preauricular or buccal incision to the subSMAS layer and fixed to the skin (Fig. 1).

Autologous fat graft was taken from trochanteric region or the abdominal wall below the umbilicus by syringe liposuction, then rinsed with saline and then transplanted to the face utilizing a 2mm canula introduced to the face through a small stab incision below the ear lobule avoiding high pressure during injection of fat, and putting the fat grafts in tunnels and in different layers to increase the contact surface of fat cells with blood supply and in some cases we needed another sessions of fat transplantation after 6 months of the previous session.

RESULTS

Twenty six patients with facial atrophy were surgically managed either with dermofat grafting or by autologous fat transplantation, the results were good with 3 cases with hematoma and ecchymosis, 2 cases with undercorrection, induration in 2 cases and overall patient satisfaction in 22 cases (Table 3).

Case presentation:

Case (1): Male patient, 24 years old with bilateral facial atrophy, managed with dermofat grafting (Fig. 2).

Case (2): Female patient, 26 years old with bilateral facial atrophy, managed with autologous fat grafting (Fig. 3).

Case (3): Female patient, 39 years old with unilateral posttraumatic (maxillofacial trauma) facial atrophy, managed with autologous fat grafting (Fig. 4).

Case (4): Female patient, 28 years old with Parry-Romberg hemifacial atrophy, managed with autologous fat grafting (Fig 5).

Table (1): Classification proposed for Parry-Romberg syndrome.

Guerrerosantos et al. [6]	
Grade I	Very mild depression in the face, occurring in acute phase of Parry-Romberg syndrome.
Grade II	Reduced thickness of the soft tissue of the face, with no bone or cartilage involvement.
Grade III	Soft tissue of the face is thinner than in grade II + initial bone and cartilage involvement
Grade IV	The most severe type of facial depression and the skin is quite close to bone with bone involvement.

Table (2): Classification of patients with facial atrophy according to method of surgical management.

	Dermofat graft		Autologous fat transplantation	
	No.	%	No.	%
<i>Unilateral facial atrophy (10 cases):</i>				
Post traumatic (5 cases)	3	11.54	2	7.69
Parry-Romberg syndrome (5 cases)	3	11.54	2	7.69
<i>Bilateral facial atrophy (10 cases) Total (26 cases)</i>	6	23.08	10	38.46
	12	46.16	14	53.84

Table (3): Complications after surgical management of patients with facial atrophy.

Complication	Number	%
Hematoma and ecchymosis	3	11.54
Injection	0	0
Prolonged oedema	0	0
Undercorrection	2	7.69
Induration	2	7.69
Total	7	26.9

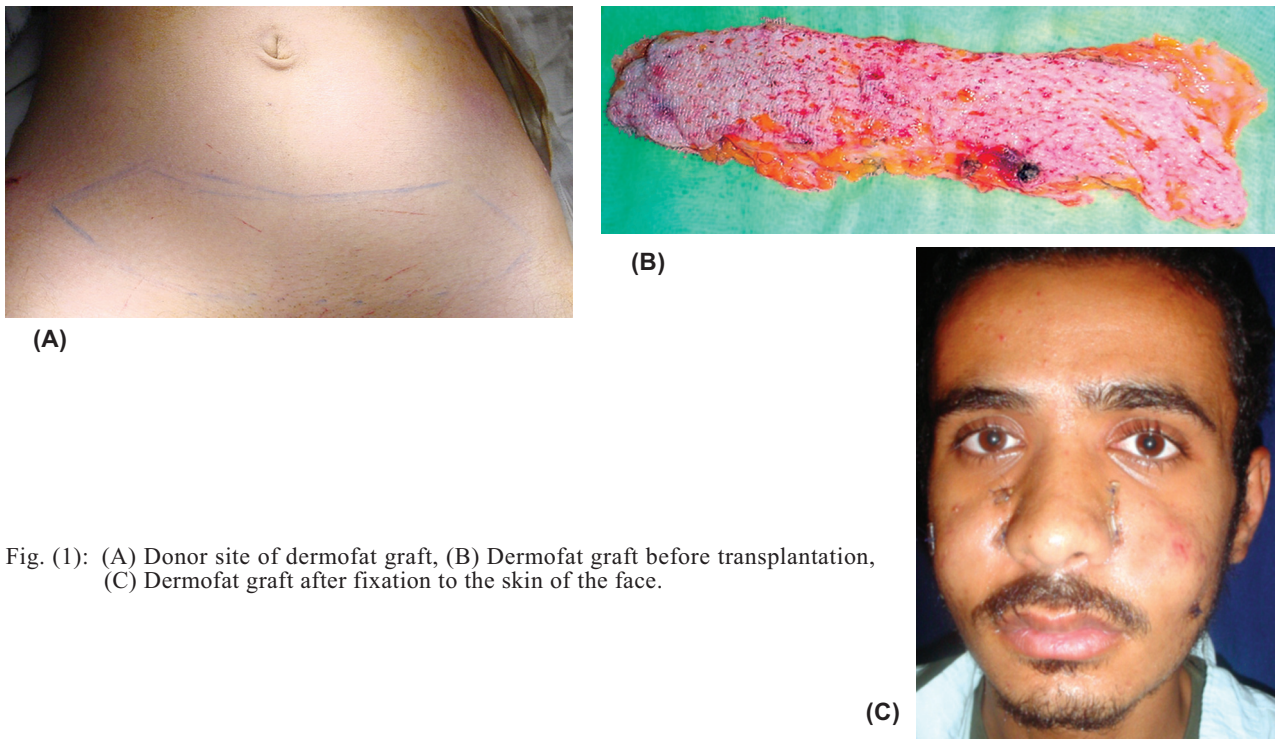


Fig. (1): (A) Donor site of dermofat graft, (B) Dermofat graft before transplantation, (C) Dermofat graft after fixation to the skin of the face.



Fig. (2): Male patient with bilateral facial atrophy. (A,B,C) Preoperative Ap, Rt. oblique and Lt. oblique views. (D,E,F) Ap, Rt. lat and Lt. lat views, 2 months after dermofat grafting.

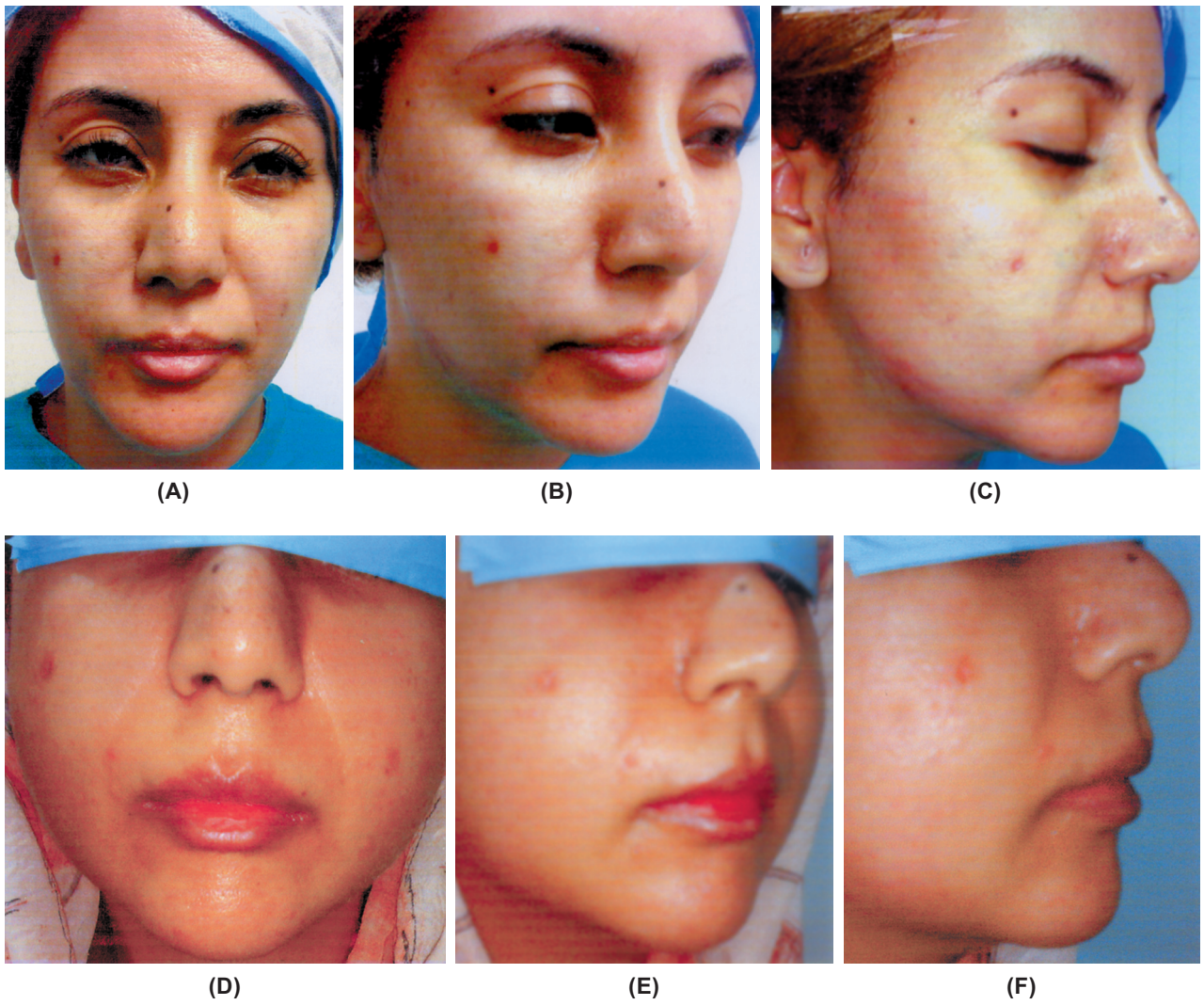


Fig. (3): Female patient with bilateral facial atrophy. (A,B,C) Preoperative Ap, oblique and lat views. (D,E,F) Ap, oblique and lat views, 3 weeks after 20ml autologous fat transplantation.



Fig. (4-A)

Fig. (4-B)

Fig. (4-C)

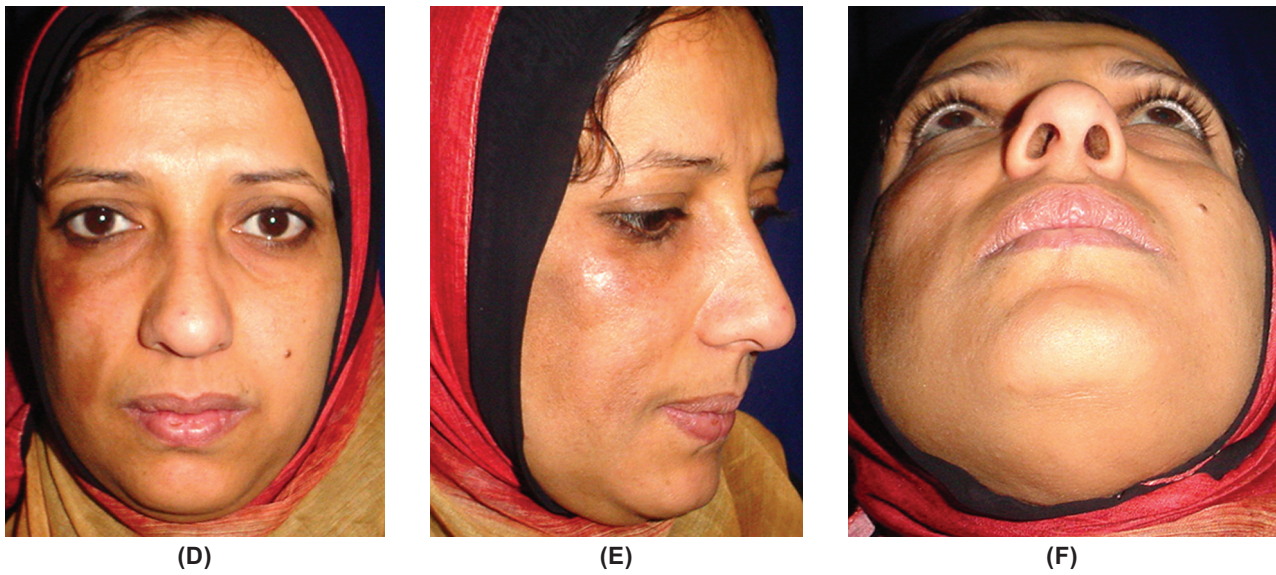


Fig. (4): Female patient with posttraumatic unilateral facial atrophy on the Rt side. (A,B,C) Preoperative Ap, Rt oblique and basal views. (D,E,F) Ap, Rt oblique and basal views, 1 month postoperative after 15ml autologous fat transplantation.

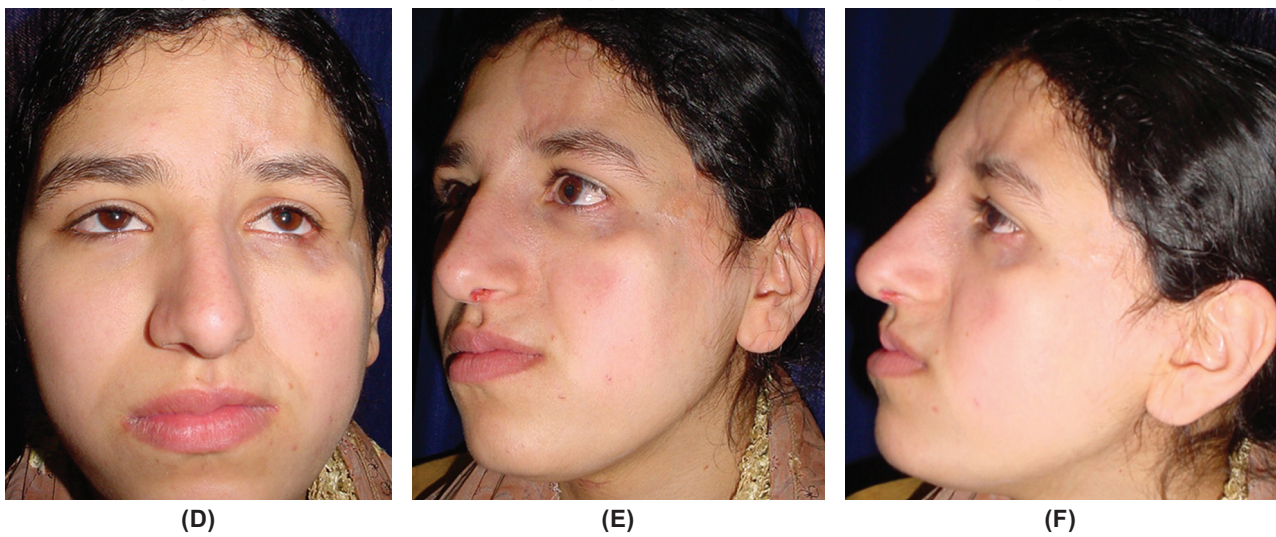
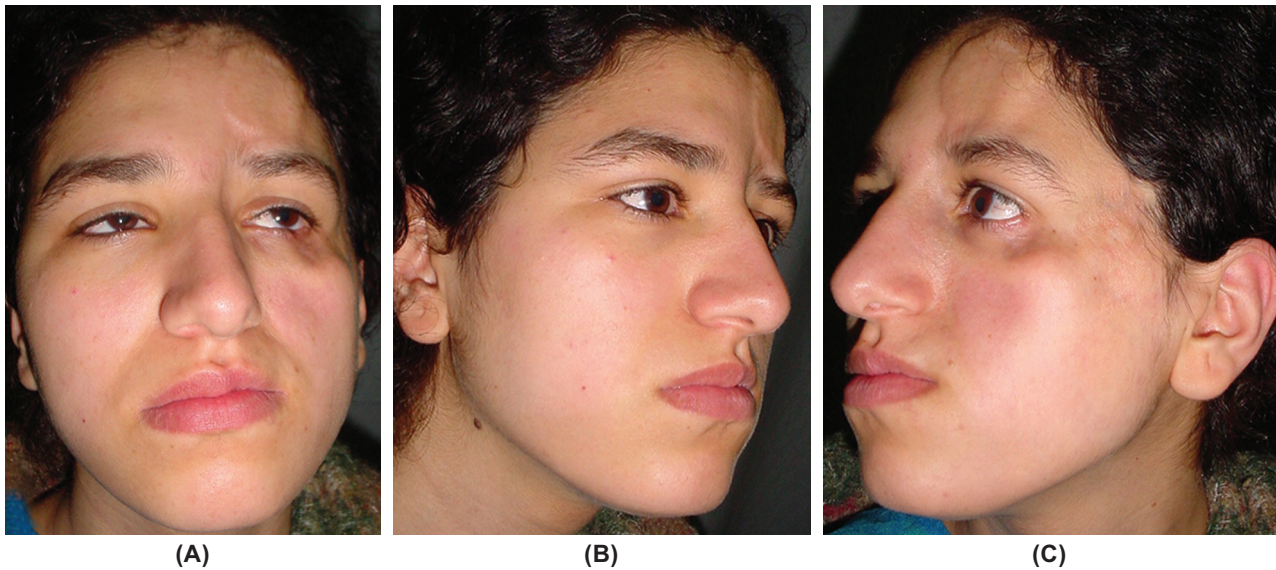


Fig. (5): Female patient with Parry-Romberg syndrome with hemifacial atrophy on the Lt side. (A,B,C) Preoperative Ap Rt lat and Lt lat views. (D,E,F) Ap, Lt oblique and Lt lat views, 3 months postoperative after 20ml autologous fat transplantation.

DISCUSSION

Plastic surgeons have been searching for an ideal method to augment soft tissue. Ideally, a substitute would look and feel like the original tissue intended to be replaced. Moreover, no or minimal donor site morbidity would be involved and finally, the procedure should be easy to perform.

The first scientific study on the survival of free fat transplantation was published in 1950 by Peer, and reported a survival rate of 50%. Several authors have published survival of fat grafts [7]. Others have shown that traumatic handling of fat results in partial or complete resorption [8]. In 1999, Coleman reported positive experiences with autologous facial fat transplantation in over 10000 patients with follow-up of up to 8 years [9].

Avelar et al. [10] used autologous fat grafting for correction of facial atrophy and they recommended that creation of multiple tunnels for the fat graft results in a greater blood supply for the transplant due to the greater contact surface between the transplanted cells and vessels that are formed, and also they avoided centrifugation of fat to minimize the damage to the transplanted fat cells.

In this study we used autologous fat transplantation for correction of facial atrophy in 14 cases and we avoided centrifugation of fat and transplanted it in tunnels and in layers in the face to increase its vascularity and viability.

Multiple procedures have been used through the years to repair sequelae of parry-Romberg disease. Guerrerosantos J and Guerrerosantos F [6] managed 95 patients with different types of facial tissue atrophy and they classified the cases according to the facial depression into four grades (Table 1), and they recommended management of depressions grades I and II by only fat grafting and for grades III and IV, they recommend combined treatment with lipoinjection, galeal flaps, free dermis-fat grafts, and bone and cartilage grafts.

In this study 26 cases with facial atrophy were managed, 14 cases with grade I and II facial depression were managed with autologous fat transplantation, and 12 cases with grade III facial depression were managed with free dermofat grafting.

Agostinin and Agostini [11] managed cases with hemifacial atrophy with free (microsurgical) adi-

pofacial anterolateral thigh flap with satisfying results.

Cox and saderberg [12] managed a case of idiopathic hemifacial atrophy with serial injection of calcium hydroxylapatite with good results.

Guerrerosantos and Guerrerosantos [6] managed 95 patients with facial atrophy with good results, but with 9 cases (9.47%) with postoperative hematoma, 7 cases (7.36%) undercorrection, prolonged oedema in 2 cases (2.10%) and induration in 4 cases (4.21%).

In this study 26 patients with facial atrophy were managed with 3 cases (11.54%) of postoperative hematoma, 2 cases (7.69%) undercorrection, and 2 cases (7.69%) induration and with patient satisfaction in 22 cases.

To conclude: Fat and dermo-fat grafting is a safe and simple method of management for patients with facial atrophy. Patients with grade I and II facial depression can be managed with transplantation of autologous fat, grade III can be managed with dermo-fat grafting, while grade IV facial depression needs in addition to fat grafting other techniques as galeal flap, dermofat graft, free flaps or cartilage and bone grafting.

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