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Case Series

Lipofilling as an aesthetic restorative technique for the facial hemiatrophy of Parry-Romberg syndrome: An analysis of 27 cases

Rachid Aloua [b,*], Ouassime Kerdoud [b], Amine Kaouani [b], Faiçal Slimani [a,b]

[a] Faculty of Medicine and Pharmacy, Hassan II University of Casablanca, B.P 5696, Casablanca, Morocco
[b] Oral and Maxillofacial Surgery Department, CHU Ibn Rochd, B.P 2698, Casablanca, Morocco

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ABSTRACT

INTRODUCTION: The aim of this paper is to present our experience using autologous fat transplantation for facial augmentation and to evaluate the effectiveness of lipofilling in different regions of the face for the reconstruction and aesthetic improvement of the facial contouring.
CASE PRESENTATION: Data in term to the age, gender distribution, harvest and injection sites, degree of satisfaction with post-surgical facial, and complications were recorded.
DISCUSSION: Progressive haemifacial atrophy, also Known as Parry Romberg's disease, is a common craniofacial disease that conventionally affects the subcutaneous tissue on one side of the face. We report here a series of 27cases of hemifacial atrophy (Parry-Romberg syndrome), admitted to our department, and treated with lipofilling in conformity with Coleman's guidelines. The volume of fat grafting was assessed by an attempt to reach symmetry with the controlateral side within a single procedure.
CONCLUSION: All patients claimed that they were satisfied or very satisfied with the aesthetic results and affirmed that it had a positive psychological impact on their daily life.

1. Introduction

Parry-Romberg syndrome is a common and devastating disease that leads to severe disfigurement and possible functional impairment after years of progressive haemifacial atrophy [4]. It has a great impact on social life; aesthetic rehabilitation is a difficult task for the rehabilitation of these patients.

2. Patients and methods

The study was performed on 27 patients (16 women and 11 men) treated in the aesthetic unity of maxillo-facial department.The period of study between June 2010 and June 2020.

The entire series had an identical indication for fat injection, i.e. haemifacial atrophy, and were initially examined to accurately assess and mark areas requiring lipofilling treatment.

Fat grafting site is in function of the most affected region of the face: upper, middle and lower. The Fat harvest, preparation and reinjection were performed in a standardised procedure in conformity with Coleman's guidelines [1].

Preoperative and post-operative photographs were systematically obtained. The repair procedure was performed with general anaesthesia and fat was taken from the abdominal wall, the thigh or the inner side of the knee. The volume of transplanted fat was determined by trying to reach symmetry with the controlateral side. Overcorrection was (O-C) performed with the awareness that there will be some volume loss over a period of time.

Post-operatively, patients were invited to come back for follow-up at two weeks, six-month, twelve-month and eighteen-month. At each follow-up visit, surgical complications were documented and patients were photographed. They were asked to rate their level of satisfaction with post-operative facial aesthetics on a five-point score (1: poor, 2: fair, 3: good, 4: very good, 5: excellent). This score has been used and validated by several previous studies [2,3]. Two groups of outcomes (positive and negative) have been described on the base of surgeon and patient satisfaction.

IBM SPSS Statistics for Windows (Version 25.0.0 Armonk, New York: IBM Corp) was used for all statistical analyses. Descriptive and Chi-square analysis were used to determine univariate relationships. The level of statistical significance was set at $P < .05$. The results are presented in Tables 1–3.

This case series has been reported in line with the PROCESS criteria [15].

* Corresponding author.
E-mail address: alouarachid1@gmail.com (R. Aloua).

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Table 1
Characteristics and results of patients with (PRS) Parry Romberg Syndrome.

characteristics	N	%
Group-Age (years)		
< 20	2	7.4
21–39	17	63.0
40–59	8	29.6
Gender		
Male	11	40.7
Female	16	59.3
Harvest site		
Abdomen	13	48.1
Thigh	5	18.5
Knee	9	33.3
Graft site		
Upper	4	14.8
Middle	14	51.9
Low	9	33.3
Complication		
Absente	5	18.5
Over-correction	8	29.6
Skin-irregularities	4	14.8
Fat-reabsorption	7	25.9
Other	3	11.1
Outcome		
Negative	14	51.9
Positive	13	49.1
Reinjection		
Yes	12	55.6
No	15	44.4

Table 2
Relationship Between outcomes, Gender, Harvesting site, and Grafting site.

characteristics		Outcome		
	NEGATIVE	POSITIVE		
Gender	Female	12	4	*p* .004
	Male	2	9	
Harvest site	Abdomen	7	6	*p* .839
	Thigh	3	2	
	Knee	4	5	
Graft site	Upper	4	0	*p*. 023
	Middle	4	10	
	Lower	6	3	

*Significant $p < .05$.

3. Results

Patient characteristics, technical considerations and results concerning their outcomes with the procedure are reported in Table 1.

Sixteen of the participants were women and eleven were men.

The average age of the 27 patients enrolled in the study was 33.93 years at the moment of surgery, leading to a sex ratio of 1.45 (range, 16–52 years).

Due to its ease of access and availability, the most frequently used donor site was the abdominal wall (13 procedures), followed by the inner side of the knees (9 procedures each). Surgical intervention was performed by our chief professor of the departement who has 15 years of operative experience.

In all cases, good incorporation of the grafted fat was observed in the host sites (Figures 1, 2 and 3).

Fig. 1. (A) Marking of harvesting abdomen wall. (B), (D) Fat preparation for autologous fat transplantation. (C)Marking of recipient facial site.

Fig. 2. A twelve-month follow up with a good result.

Retrospective photographic documentation analysis showed a progressive volumetric decrease until about 6 months after surgery; after that, the volume of the graft remained fairly stable (Figure 4).

Eight of our patients have graft hypertrophy as a complication; this overcorrection (O-C) was done with the expectation that there will be some loss of volume over a period of time. In spite of massage

Table 3
Relationship Between seeking reinjection and follow-up period.

characteristics		Follow-up (months)			
	Six	Twelve	Eighteen		
Reinjection	Yes	2	4	6	*p*. 048
	No	9	1	5	

*Significant $p < .05$.

Fig. 3. A six-month follow up of the overcorrection with a satisfying result.

Fig. 4. A fat-reabsorption after six-month follow up.

therapy, Four patients had skin irregularity (S-I). Seven patients felt the need for a second surgery. A second fat transfer after fat reabsorption (F–R) was performed in 3 patients.

There were no major surgical complications, either at the fat harvesting site or at the reconstructed site. Slight oedema and ecchymosis were common during the first week postoperatively; no hematomas, infections, vascular or nerve damage was noted.

The assessment of surgery outcomes after the last follow-up visit clearly showed better results in the middle region and in the lower region. Less satisfactory results were obtained in the upper hemi-face region (p. 023) Table 2.

In all cases, patients reported improvement and relief after the surgery.

Follow-up fluctuated from six months to eighteen months; facial aspect remained stable for 5 patients during this follow-up period. Two, four and six patients requested a second fat re-injection surgery respectively after six, twelve and eighteen months after the first one.

4. Discussion

Progressive haemifacial atrophy, also known as Parry-Romberg syndrome, is a common and devastating disease that results in severe disfigurement and potential functional impairment after years of progressive hemifacial atrophy [4].

The atrophy will end when the disease goes into remission, although there may be significant tissue destruction in the meantime. Many different methods have been used to treat these defects, ranging from fillers and implants to free tissue transfers [5]. Lipofilling provides an option for voluminous flaps, improving skin quality and preserving the natural contours of the face [6]. Due to its ease of use; fat grafting can be tailored to each patient and is a viable reconstructive option for the location of the defects in question.

When correcting PRS soft tissue defects, the amount of fat injected can be adapted to the level of tissue loss. Small volumes of 1–3 ml can be infused in isolated areas such as the periorbital or glabellar areas, while larger volumes can be administered in the facial and mandibular areas [7,8].

Our analysis revealed that the amount of fat transplanted was determined by attempting to obtain symmetry with the controlateral side depending on the location and severity of the soft tissue defect.

Lipofilling has several benefits in comparison to flap-based procedures, including a reduce in donor site morbidity, operating time and complications, which indicates the viability of fat grafting as the primary method for correcting defects associated with PRS and achieves a high level of reconstructive precision [9,10].

One of the main challenges of autologous fat grafting is the variable rates of reabsorption of the injected aspirate. Many authors recommend an overcorrection of 20–50% to compensate (29.5% of our patients had an overcorrection as a benefit-complication in the long term.), although it is expected that several sessions will be required for larger defects. Variability in fat reabsorption is probably caused by a combination of donor site, fat collection method, grafting and recipient site [11].

In our study, we were able to evaluate the effectiveness of lipofilling in relation to the different facial region. The most satisfactory outcomes of our study were obtained in the malar and lateral regions of the cheeks (middle region) followed by the chin, the naso-labial fold and the puppet folds (lower region) ($p < .05$).

Why are the results better in some anatomical regions than in others, as our study shows? There are no scientifically justified explanations, only hypotheses that are still waiting to be experimentally proven. The most widespread theories in the literature relate to the degree of vascularisation and mobility of the recipient site and the donor site quality (fibrosis, ischemic changes, other morbidities, etc.).

In our series, a second fat transfer was performed in 12 patients, when the patient and the surgeon considered the obtained result insufficient, in case of under-correction of the defect. The explanation for the under-correction could be an underestimation of the volume required, high reabsorption of the grafted fat or an inadequate recipient site [12]. In our trial the request for second fat grafting is depending on the time which explains time-reabsorption of the fat (p .048).

Skin irregularities are less frequent. It may be observed when fat is injected too superficially or in an area with thin skin. They can be very deceiving, in particular for female patients. In our trial, four patients complained of skin irregularities on the graft site, these Irregularities may be noticed when fat is injected too superficially or in an area with thin skin. They can be very deceiving, in particular for female patients.

The subjective evaluation of the outcomes (pre- and post-operative photographs, surgeon judgment and patient satisfaction) is the principal limitation of this study. Negative outcome based specially on patient satisfaction was more frequent in the females (p.004). In spite of this, our perception of the results seems to be strongly related to the level of patient satisfaction, which makes the precision of the assessment method relatively high.

Satisfaction degree and percentage of results were rated as v̈ery good(M̈SS = 5) and g̈ood(M̈SS = 4) and appear to correlate with the outcomes of Mojallal and Fulton [13,14].

Surgery was performed by maxillo-facial surgeons who had been practicing these techniques for many years. The procedures were well tolerated and had positive effects for the patients. Most

impressive, even when the esthetic result was limited, patients seemed satisfied and we observed positive results regarding behavioral changes, with patients showing improved interpersonal relations and increased self-esteem. With well-trained surgeons, harmonious and safe results can be achieved using Coleman's lipostructure in patients with Parry Romber syndrome who present facial lipoatrophy, leading to prompt and long-term impacts on the patients' self-confidence.

5. Conclusion

Fat reinjection is a simple, efficient and reproducible procedure, with a high degree of satisfaction and few complications. The corrective surgery of facial hemiatrophy in Parry-Romberg syndrome can provide benefits in terms of physical appearance and psychological well-being, and should be considered as a part of the general management.

Declaration of Competing Interest

Authors of this article have no conflict or competing interests. All of the authors approved the final version of the manuscript.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Rachid Aloua: Corresponding author writing the paper.
Ouassime kerdoud: writing the paper.
Faiçal Slimani: Correction of the paper.

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