

Autologous Fat Grafting as Adjuvant Treatment in Facial Reconstructive Surgery: Case Report

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Abstract:

Introduction: Autologous fat grafting (lip transfer) allows the repair and augmentation of soft tissues and is increasingly used in both cosmetic and reconstructive surgery. Autologous fat has several advantages, including biocompatibility, versatility, natural appearance, and low donor site morbidity. The main limitation is unpredictable graft resorption, which ranges from 25% to 80%, probably as a result of ischemia and lack of neo angiogenesis. To avoid these drawbacks, several studies have sought new ways to increase the viability of transplanted tissue.

Aim: To present a clinical case that highlights current practices and short-term future applications of fat transfer for maxillofacial reconstruction of large defects.

Clinical case: This is a 33-year-old male patient who presented scarring atrophy due to multiple surgical interventions previously performed for mandibular resection and reconstruction due to a plexiform ameloblastoma in the right hemimandible. The fat transplant preparation technology was applied, using the manual liposuction and centrifugation method. Lip transfer was performed in one phase.

Conclusion: Fat transfer has the potential to be an intervention in which resorption rate, tissue quality and safety can be predicted, as it appears to be an effective treatment for contour deformities in facial reconstruction.

keywords: lip transfer; reconstructive surgery; autologous graft; adjuvant alternatives; liposuction

Introduction

Lip transference consists of extracting localized fat from some part of the body, to add it later in areas where the aim is to increase volume [2].

Recent studies have investigated that fat grafts and their autologous stromal cells derived from adipose tissue may result in increased graft viability as assessed by tissue volume enhancement [3,4].

The use of fat transfer to correct contour deformities is considered one of the main advances in reconstructive cosmetic surgery. Its applications in facial reconstructive surgery have been of particular interest due to the prospect of achieving autologous reconstruction using a minimally invasive approach [5].

Case Report:

A 33-year-old male, who after hemi mandibulectomy due to right plexiform ameloblastoma, placement of a reconstruction plate plus taking and application of a free microvascular fibula flap, presents multiple complications, including exposure of osteosynthesis material with the presence of a skin defect, achieving its closure with rotation of the

pectoralis major flap (Figure 1). Infiltrations with 40mg triamcinolone, 2% lidocaine in a 3:1 ratio were performed sub dermally in scar fibrosis areas, avoiding fatty areas to avoid lipodystrophy.

Facial asymmetry is evidenced in the angle region and mandibular body that extends in the cervical region due to loss of volume of the mandibular and cervical contour, for which fat transfer is decided as an adjuvant treatment.

The surgical act of autologous fat extraction is performed in the abdominal region, under intravenous sedation, 3 mm diameter cannulas are used. The donor area was injected with Klein's solution (a combination of sodium bicarbonate, 1% lidocaine, and 1:200,000 epinephrine) and the fat was extracted using a 3mm cannula connected to a 20cc syringe, manually withdrawing the plunger under slight negative pressure.

A modified technique was used to process the liposuction, which consisted of loading 6 20mL syringes and centrifuging at 1500rpm for 1min 30sec; the blood and the tumescent fraction of the lower layer and

the oil is decanted and wiped with gauze. This centrifugation technique separates the viable cell fraction into high- and low-density fat. Higher-density fat has greater vascularity, decreased fibrosis, and a higher survival rate than lower-density fat. 2mm and 1mm transfers are used to

subsequently infiltrate microfat with a 1.2mm diameter needle in the area of the mandibular body and cervical region on the right side. The procedure is carried out in one phase (Figure 2).



Figure 1: Preoperative Photograph.



Figure 2: Intraoperative Photograph.

Controls are carried out 3 months, 6 months and 1 year after surgery where a lasting and aesthetic result is observed in the return of the mandibular and facial contour (Figure 3).

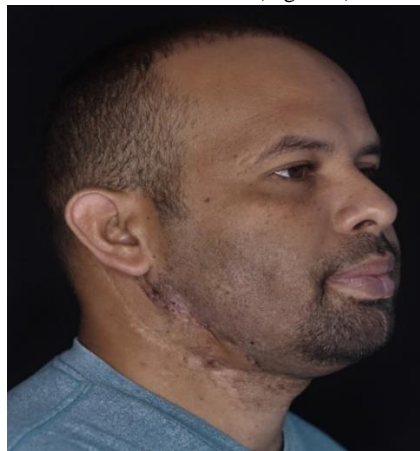


Figure 3: Postoperative Photograph

Discussion:

Lip transference has numerous advantages compared to procedures based on flaps, such as decreased morbidity at the site and operating time of the donor area, total surgical time, and complications. The feasibility of fat

grafting as a combined method to correct large defects achieves a high degree of reconstructive precision [6,7].

Autologous fat transfer may play an important role in the treatment of disfiguring congenital syndromes such as progressive hemifacial atrophy (Parry-Romberg syndrome) or hemifacial (craniofacial) microsomia. For

these disorders, the only viable alternative to correct volume deficits remains free flap transfer, which often leads to disappointing long-term results due to flaccidity and impaired facial musculature [5].

However, the unpredictability of long-term graft retention has hampered the widespread acceptance and application of autologous fat transfer in reconstructive plastic surgery. The loss of a significant part of the grafted volume seems to be an inherent limitation of autologous fat transfer, which has been the main criticism of this technique.⁵ Noting that, in contrast to what has been reported in the literature, despite the inherent limitation regarding loss of grafted volume, in the present study satisfactory results were observed in the immediate and long term postoperative follow up, 1 year after the surgical procedure.

Techniques for processing liposuction are substantially more controversial than harvesting techniques. According to a recent national survey of members of the American Society for Aesthetic Plastic Surgery, 47% currently use centrifugation to process fat prior to grafting, 29% wash fat in normal saline, 12% perform other unspecified techniques, and 12% do not process the collected fat.⁷ In the present study, the processing of the liposuction and subsequent centrifugation was carried out successfully. Where the before-mentioned technique separates the fraction of viable cells into high- and low-density fat and the literature attributes different rejuvenation and graft taking capacities to each of the fractions [7].

Recent laboratory data exploring the differences between high- and low-density fat demonstrate that higher-density fractions contain more progenitor cells and higher concentrations of various angiogenic/vasculogenic and anti-inflammatory adipokines [7].

Studies published to date on autologous fat transfer after treatment of craniofacial pathology seem to suggest that this technique may provide effective treatment for a wide range of aesthetic and functional sequelae [8,9,10].

Conclusion

Fat transfer has certain advantages over existing methods of removing facial soft tissue defects: no visible scar, good long-term aesthetic and functional result, natural contours of the face.

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