

## How Much of Facial Lipofilling Survive in a year How to Quantify It? Evidence-Based Medicine Data

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### ABSTRACT

Fat autotransplants are one of the more frequently used treatments in Plastic Surgery nowadays, such in reconstructive surgery to augment the soft tissue defects of malformed and deformed faces after surgical operations, traumas and tumors; as in aesthetic surgery to fill and disguise the wrinkles and grooves of the aging faces in order to get a younger aspect.

**Keywords:** Reconstructive surgery; Heterogeneous; Facial

### INTRODUCTION

The advantages of being a biological, natural, ubiquitous, plentiful, safe and easy to get material without sequelae of the donor site [1] joined to the easy and reproducible technique of facial lipofilling described by Coleman in 1997 [2] explain the increasing of this practice all over the world. However, the variable and unpredictable results and the heterogeneous and subjective evaluation methods of the fat survival, go on being controversial issues of this procedure.

Previously, microscopical studies of the biological behaviour of fat autografts in recipient site had led to adipocyte survival theory of Peer [3], confirming that mature and immature adipocytes of the autograft both contribute to the clinical cellular volume that survives along time. Intrinsic factors of the autotransplanted tissue and local factors of the recipient site of implantation would explain the variability of the survival rates found in scientific literature and the variable clinical results obtained by different authors and series.

### MATERIALS AND METHODS

Fat autotransplants were performed using the facial lipofilling technique of Coleman [2]. Clinical volumes and tissue samples were taken in each surgical step: extraction, centrifugation and around one year follow-up. The volumetric quantification of the grafts was performed in every histological sample using the stereological method [4], becoming the first application of Stereology to the quantification of grafts described in scientific literature.

This method requires an optical microscope connected to a computer and to a microcator that allows the superposition of counting grids above the microscopical fat tissue pictures captured

on the tv monitor and the non-biased tridimensional calculation of the stereological parameters. The stereological principles of the optical disector and nucleator allow to get the basic stereological parameters of volume fraction of adipose tissue and the numerical density and cellular volume of the adipocytes, parting from which it was possible to get the absolute number of adipocytes and the volumetric taking rate (VTR) of the grafts that survive along time through the Serra-Santamaría equation [5].

Statistical analysis were performed, expressing all data in mean  $\pm$  standard deviation. The Student t test and the analysis of variance in aspirated, centrifuged and grafted fat sample were performed. The Kaplan-Meier survival analysis of the stereological parameters of the grafts was performed to obtain the survival probability in any moment of the graft evolution. The survival curve along time give us an idea of the biological behavior of autotransplanted fat on the face [6].

### RESULTS AND DISCUSSION

The evidence of viable adipose tissue in fat grafts means that autotransplanted fat survives, being partially substituted by scarred fibrous tissue, what supports the Peer's Survival Theory. The stereological quantification points out that two thirds (66%) of the implanted fat volume on the face survive at 14 months follow-up [7]. Comparing with another survival rates obtained by other authors or methods, ours is a high rate inside the published margin, no better nor worse than other, but obtained by an objective evaluation method. This survival rate afford us to offer a half-term successful result in selected cases, improving the doctor-patient relation. The survival curve show us a fall down of the survival fraction of the stereological parameters of the grafts [8], describing a descendent tendency along time till stabilization around 18

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months of follow-up.

## CONCLUSION

1. The present study ratifies the Peer's Survival Theory of fat autotransplants.
2. 66 % of the autotransplanted fat on the face survives at the 14 months follow-up.
3. Autotransplanted fat is a possible, factible, coherent and partial treatment for the soft tissue defects of the face, that is possitively valuated by the patients, although clinical results are not optimal nor permanent along time.
4. Feasibility, ability and reproductibility of the Stereological method to evaluate the survival of fat autotransplants have been probed. Therefore, it would allow the standardized comparison between other studies and authors.

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