INPLASY PROTOCOL

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None declared.

3D Surface Imaging Volumetric Analysis in Facial Lipotransfer: Is There Science Behind the Art?

Wang, W[1]; Guo, WH[2].

Review question / Objective: Analysis of the reliability of the 3D measurement for the Volume Retention rate after facial fat grafting.

Condition being studied: 3D surface imaging has been considered the most objective way to measure volume retention after facial fat transplantation due to its precise facial morphology capture ability. However, a lack of standardized 3D operation processes and reliability tests led to uncertain errors. Therefore, it is urgent to summarize and understand the current situation and improve it. To our knowledge, this is the first systematic review to analyze the 3D measurement process for facial fat volume retention.

INTRODUCTION

Review question / Objective: Analysis of the reliability of the 3D measurement for the Volume Retention rate after facial fat grafting.

Rationale: This review selected healthy individuals who underwent non-cell-assisted structural fat grafting just once and were measured by 3D surface imaging. This review thought deeply about the 3D operation process and corresponding results, then, for shortcomings, drew lessons from related fields and summarized normative steps.

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METHODS

Search strategy: The search for the articles was conducted in June 2022 and four electronic databases were used. In each database, the following descriptors will be used: ("Face" OR "Facial" OR "midfac*" OR "mid-fac*") AND ("Autologous fat graft" OR "autologous fat transfer" OR "Adipocyte*" OR "Adipose Tissue" OR "Adipose") AND ("Transplant*" OR "Autograft*" OR "transfer*" OR "Autologous" OR "graft*") AND ("Imaging, Three-Dimensional" OR "Three Dimensional" OR "3D") AND ("Residual Volume" OR "volum*" OR "retent*" OR "Graft Survival*" OR "Treatment Outcome" OR "Outcome*" OR "Treatment*") NOT ("stromal vascular fraction" OR SVF OR "Parry-Romberg" OR "Platelet rich plasma" OR "PRP" OR "Hemifacial Atrophy" OR "HIV" OR "malformation" OR "deformity").

Participant or population: Healthy participants were free of deformities and diseases.

Intervention: Participants underwent non-cell-assisted structural fat grafting just once and were measured by 3D surface imaging.

Comparator: The use of 3D technology varied among operators and did not change with subjects. In order to observe the results of the 3D procedure, this review adopted only one type of subjects without setting up a control group.

Study designs to be included: Prospective studies.

Eligibility criteria: This review will be conducted based on the PRISMA guidelines and the PIOS approach. Exclusion criteria :1. Deformed or diseased people,2. Cell-assisted transplantation and more than one operation3. review and commentary.

Information sources: PubMed, Embase, Web of Science, and Cochrane.

Main outcome(s): 3D procedure: 3D software, image pre-processing, alignment methods, reliability test (validity and precision test), surgery information (sample size, age, recipient sites, and follow-up time), and 3D measurement results: volume retention rates.

Additional outcome(s): Standard Image pre-processing, the state of 3D image registration, and standards for reliability testing of registration.

Data management: We made a complete reading of the selected articles and summarized the relevant information in a table.

Quality assessment / Risk of bias analysis: ROBINS-I as a tool to assess "Risk Of Bias In Non-randomised Studies - of Interventions". The tool views each study as an attempt to emulate (mimic) a hypothetical pragmatic randomized trial and covers seven distinct domains through which bias might be introduced. Two researchers independently applied ROBINS-I. An additional reviewer was involved when a consensus was not reached.

Strategy of data synthesis: We extracted data standardly by tabulating the following information: author, 3D software, image clipping, alignment method, reliability test (validity and precision test), sample size, age, recipient site follow-up time, and volume retention rates. Two investigators conducted the literature search independently to verify data accuracy and completeness, with a third reviewer resolving any uncertainties.

Subgroup analysis: This research included one type of subject, so subgroup analysis was not performed.

Sensitivity analysis: Sensitivity analysis could not be performed because some studies had no control group and follow-up times of different studies were different.

Language: Language limits were not imposed on the search.

Country(ies) involved: China.

Keywords: Face; Autologous fat graft; Imaging, Three-Dimensional; Volume retention.

Contributions of each author:
Author 1 – Wei Wang - Performed the search in the database, data collection, evaluated the risk of bias of included studies and drafted the manuscript.
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