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The impact of diabetes on abdominoplasty outcomes: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 February 2024 and was last updated on 28 February 2024.

INTRODUCTION

Review question / Objective The aim of this systematic review is to investigate the impact of diabetes or non-diabetes in terms of the outcomes after abdominoplasty in the patietnts undergoing abdominoplasty to allow plastic surgeons to optimize the treatment pathway and develop a scientific surgical strategy for each diabetic patient to minimize complications after abdominoplasty. To this end, the proposed systematic review will address the following question: Dose the diabetes or non-diabetes affect the outcome of abnominoplasty in patients undergoing this surgery?

Condition being studied Abdominoplasty is one of the most popular cosmetic surgeries performed by plastic surgeons worldwide. Most patients desire cosmetic results or improved function. It is important to provide better final results in abdominoplasty and higher patient satisfaction. To this end, it is essential to reduce postoperative complications through timely management of potential risk factors. Lots of complications can occur after abdominoplasty, including wound infections, dehiscence, seroma, and thromboembolism. Several factors are known to increase the risk of these complications, including body mass index, smoking, and diabetes.

Diabetes is a common chronic metabolic disease characterized by hyperglycemia and microvascular impairment, leading to unsatisfactory surgical outcomes and even various adverse postoperative complications. Delayed wound healing is an urgent problem to be solved in diabetic patients after surgery. On the one hand, abnormally high blood glucose provides a suitable microenvironment for bacterial colonization, which prolongs surgical wound healing. It is reported that wound infections

are one of the most common postoperative complications. On the other hand, compromised vessels lead to inadequate oxygen and nutrient supply to the surgical site, which impairs surgical wound healing. In addition, diabetic patients are prone to postoperative complications due to their impaired immune function and stereotyped metabolic stress response. In diabetics, immune cell dysfunction increases the risk of postoperative infection. Surgical stress also worsens glucose homeostasis and immune function and increases the risk of complications. Therefore, diabetes may increase the incidence of complications in patients who have undergone abdominoplasty.

There is little detailed systematic review and meta-analysis evaluating the association between diabetes and complications of abdominoplasty. A systematic and comprehensive review and analysis will allow plastic surgeons to optimize the treatment pathway and develop a scientific surgical strategy for each diabetic patient to minimize complications after abdominoplasty.

METHODS

Search strategy This meta-analysis will be conducted according to the latest reporting method of systematic reviews (PRISMA 2020).We will search Medline Ovid, PubMed, Web of Science, and the Cochrane CENTRAL databases which are queried from inception to January 2023, with the following string search [abdominoplast* OR panniculectom*] AND [diabet* OR diabetes mellitus]. Only studies meeting the eligibility criteria will be included in the meta-analysis.

Participant or population Patients undergoing abdominoplasty will be eligible for this review, with no exclusions based on gender or age.

Intervention The impact of diabetes on outcomes of abdominoplasty.

Comparator The impact ofnon-diabetes diabetes on outcomes of abdominoplasty.

Study designs to be included Randomized controlled trial, prospective or retrospective cohort studies, and observational studies with comparative data.

Eligibility criteria Studies that met the following criteria will be included: (1) they reported a randomized controlled trial, prospective or retrospective cohort studies, and observational studies with comparative data; (2) they described surgical outcomes in diabetic patients undergoing abdominoplasty; (3) they reported data on primary and secondary outcomes. Primary outcomes were overall complications, including all complications reported in the studies. Secondary outcomes including major complications (including those that required reoperation or hospital readmission or occurred as thromboembolic events and deaths) and minor complications (including those that were treated as outpatient procedures: wound-related complications, minor infections, seromas, and hematomas). We will exclude studies with missing or incomplete primary data, non-English language reports or studies from animal research, and reviews, meta-analyses, case reports, case series, conference abstracts, letters, editorials, or commentaries.

Information sources Medline Ovid, PubMed, Web of Science, and the Cochrane CENTRAL databases.

Main outcome(s) Primary outcomes are overall complications, including all complications reported in the studies. Secondary outcomes includes major complications (including those that required reoperation or hospital readmission or occurred as thromboembolic events and deaths) and minor complications (including those that were treated as outpatient procedures: wound-related complications, minor infections, seromas, and hematomas).

Quality assessment / Risk of bias analysis The Newcastle–Ottawa scale (NOS) is used independently by two reviewers to assess methodological quality. The NOS is a quality assessment tool for nonrandomized studies to be used in a systematic review. It consists of 8 items in the categories of selection, comparability, and outcome.

Strategy of data synthesis Meta-analysis will be performed using Stata version 16.0 (Stata Corp, College Station, TX USA, 2019). The correlation between diabetes and complications after abdominoplasty will be calculated as odds ratio (OR) with 95% confidence intervals (95% CIs). Heterogeneity between studies will be assessed using Q Cochran and I2 statistics. If the I2 heterogeneity index is higher than 50%, pooled effects and 95% CIs will becalculated using a random-effects model with the DerSimonian-Laird method; otherwise, a fixed-effects model with inverse variance will be used. $P < 0.05$ is considered statistically significant.

Subgroup analysis Subgroup analysis will be performed in terms of smoking or non-smoking.

Sensitivity analysis Sensitivity analysis is performed to check the reliability and robustness of the final primary outcomes in this meta-analysis using Stata version 16.0. Then, funnel plot, Egger's test, and Begg's test will be applied to evaluate publication bias.

Country(ies) involved China.

Keywords Abdominoplasty; Complication; Diabetes Mellitus; Tummy tuck.

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