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Review

Current evidence on the role of smoking in plastic surgery elective procedures: A systematic review and meta-analysis



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Summary *Background:* Smoking is considered to be a significant risk factor for the development of postoperative complications after various surgical procedures, mainly by limiting oxygen delivery to tissues. Evidence on the collective impact of smoking in aesthetic procedure outcomes is scarce. The aim of this study is to evaluate the current evidence on the association between smoking and postoperative outcomes in patients who underwent common elective procedures in plastic surgery.

Methods: PubMed and Cochrane bibliographical databases were searched from January 1950 to October 2016 for studies reporting on patients who underwent facelift, abdominoplasty, breast reduction and breast reconstruction and for studies with included data on smoking history of treated patients.

Results: Fifty-three studies reporting on postoperative complications in tobacco users undergoing facelift, abdominoplasty, breast reduction and reconstruction were identified. Tobacco use is found to significantly increase the total number of postoperative complications as far as abdominoplasty (OR: 5.43; 95% CI = 2.92–10.10), breast reduction (OR: 2.36; 95% CI = 1.64–3.39)

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and breast reconstruction (OR: 1.91; 95% CI = 1.69–2.17) are concerned. Smoking history does not significantly affect total postoperative complications after facelift procedures (OR: 3.36; 95% CI = 0.92–12.30).

Conclusions: Smoking predisposes to surgical site infections, delayed wound healing and skin necrosis in patients undergoing the most common aesthetic procedures in plastic surgery. More rigorous and detailed reporting on the history of tobacco use and surgical outcomes following plastic surgery procedures is needed to better quantify the impact of smoking on the overall postoperative care for this patient population.

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Introduction

Smoking is highly associated with the development of post-operative complications after a variety of surgical procedures. Specifically, tobacco use has been reported as a major risk factor for postoperative pulmonary, cardiovascular and surgical site complications.^{1–6} The indirect effect of tobacco metabolism byproducts on oxygen supply to the tissues has been proposed as a possible mechanism, as it impairs the healing process and increases the risk for wound infections.^{7–11}

The association of tobacco use with postoperative infection and delayed wound healing poses a challenge for the plastic and reconstructive surgeon who is expected to perform a wide variety of aesthetic or reconstructive procedures on an active smoker.^{12,13} Improved functionality and better cosmetic result are the ultimate goal of such interventions, however risk factors interfering with the wound healing process could potentially affect both functionality and cosmesis.²

According to the most recent statistics published by the International Society of Aesthetic Plastic Surgery, facelift, abdominoplasty, breast reduction and breast reconstruction are four of the most commonly performed aesthetic surgery procedures all around the globe.¹⁴ In 2016 more than 1,700,000 elective plastic surgery operations have been performed in the United States and the aforementioned ones were totalling 400,000 of them.¹⁵ It is also apparent that over the last 16 years an ascending trend in the occurrence of this operation has been widely observed.¹⁵ Since optimal aesthetic outcomes are always the goal, it is important to investigate the impact of aggravating factors, such as smoking tobacco products, on the outcomes of these procedures and the complications they could possibly cause.

The aim of this article was to systematically review the current evidence of published studies reporting on patients who underwent facelift, abdominoplasty, breast reduction or breast reconstruction and evaluate the potential association between tobacco use and postoperative suboptimal outcomes.

Methods

Search strategy and article selection

This systematic review is conducted according to the guidelines of Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) and in line with the protocol agreed by all authors.¹⁶ Eligible studies were identified by a meticulous search of PubMed and Cochrane bibliographical databases (last search: 31 October 2016). Two investigators (IK and VT) working independently executed the search using the keywords “smoking”, “tobacco”, “nicotine”, and “cigarette” as a main search component. More specifically, in our search we included all possible combinations of the following keywords: “facelift”, “rhytidectomy”, “abdominoplasty”, “dermolipectomy”, “tummy tuck”, “breast reduction”, “mammoplasty”, “mastoplasty”, “breast reconstruction”, “breast implant”, “TRAM”, “transverse rectus abdominus myocutaneous”, “expander”, and “tissue-expansion”. If there were discrepancies between the two authors, then a third reviewer (E.S.) was consulted and decision was reached by consensus. In addition, all references of relevant reviews and eligible articles were hand-searched for potentially missed eligible studies following a snowball procedure.

We included studies reporting on postoperative outcomes of four types of plastic surgery procedures (i.e. facelift,

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