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GENERAL REVIEW

Smoking and plastic surgery, part II. Clinical implications: A systematic review with meta-analysis



*Tabac et chirurgie plastique, partie II. Conséquences cliniques :
revue systématique de la littérature et méta-analyse*

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Cosmetic surgery;
Bariatric surgery
sequelae;
Microsurgery;
Breast reconstruction

Summary

Objectives. – Tobacco addiction is a risk factor for complication in plastic surgery. The authors have assembled concrete arguments detailing the risks of perioperative and postoperative complication that are incurred by a patient with continued tobacco intoxication who wishes to undergo a surgical intervention.

Research strategy. – Through application of the PRISMA criteria, we have carried out a systematic review of the literature, in which we explored five databases while using predefined keywords. We selected randomized, controlled observational studies on the perioperative and postoperative complications related to tobacco use in actively smoking, abstinent and non-smoking patients.

Data collection and analysis. – The levels of evidence for each article were evaluated. Risk of bias was assessed using the Newcastle-Ottawa Scale. Incidence parameters including the Odds Ratio and relative risk were calculated for each complication of which the number of occurrences had been indicated. Meta-analysis of the results was carried out.

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Results. — We included 60 observational studies. In the cosmetic surgery group, we calculated a combined Odds Ratio of 2.3 [1.51–3.54] $P < 0.001$ for surgical site infections and 2.5 [1.49–4.08] $P < 0.001$ for delayed wound healing. In the bariatric surgery sequelae group, we found a combined Odds Ratio of 3.3 [1.90–5.64] $P < 0.001$ with regard to delayed wound healing and 3.1 [1.39–7.13] $P = 0.006$ for cutaneous necrosis. No proof was provided as to the possible influence of tobacco on the success rate of free flap microsurgery, but it is difficult to extrapolate results on the latter to digital reimplantation.

Conclusions. — The review underlines the fact that patients with smoking habits run a significantly heightened risk of cutaneous necrosis, particularly in the event of major detachment (cervico-facial lift, skin-sparing mastectomy, abdominoplasty), of additionally delayed wound healing and of additional surgical site infections. Rigorous preoperative evaluation of smokers could help to diminish these risks.

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Introduction

A smoker undergoing plastic surgery incurs a major risk of postoperative complications. Active smoking should be considered as a highly prevalent disease in the French population, since 33% of French adults are smokers. Postoperative repercussions specifically implicate the wound healing process. A plastic surgeon performing a predominantly functional operation is frequently confronted with this problem, especially insofar as the patient does not necessarily tell the truth about his tobacco consumption.

On a worldwide scale, there is now a rise in awareness of the benefits of smoking cessation with regard to surgical and anesthetic risk [1,2]. All in all, a smoker is 1.38 times more likely to die on the operating table than a non-smoker [3]. Approximately 100,000 plastic surgery operations take place in France each year, but surgical reviews include a relatively low number of French publications, which is one reason why the awareness mentioned above is less than universally shared.

Our objective in this study was to develop concrete responses as well as assessment of the scientific level of evidence on the elevated risk of complications incurred in plastic surgery by active smokers in comparison with abstinent smokers and non-smokers; in order to achieve this double objective, we carried out a systematic review, followed by meta-analysis of the results. In our synthesis of the latter, we wish to put forward compelling arguments to be presented to a patient when informing him of the need for total perioperative smoking cessation. What shall happen if the patient continues to smoke, or lies on his smoking status? And if cessation fails to occur, should surgery be postponed?

Material and methods

Eligibility criteria

We included randomized controlled and observational studies reporting on the incidence of perioperative and postoperative complications secondary to tobacco consumption in the framework of plastic surgery. The studies had to compare the rate of complications occurring in active smokers as compared with abstinent smokers or non-smokers. Abstinent smokers have to have constantly abstained

from smoking through at least the fifteenth day after the operation.

We excluded clinical cases, correspondences and observational studies presenting a number of participants (less than 60 patients) insufficient to produce significant statistics.

Research strategy

Five databases were interrogated for the period 1972 – July 2014: Medline, Cochrane Library, Pubmed Central, Pascal, and Web of Science. As a complement, the references associated with the different articles and systematic reviews of the literature were explored manually and added on. The research involved English and French-language publications. There was no limit pertaining to the age and sex of the subjects.

We decided to divide plastic surgery, which is a particularly wide-ranging specialty, into several sectors. Our keywords were (“smoking” OR “nicotine” OR “tobacco”) AND (“cosmetic surgery” OR “bariatric surgery sequelae” OR “microsurgery” OR “breast reconstruction”).

Study selection

Selection was carried out by the first author (IP); in the event of uncertainty, the senior author (BC) was consulted for advice. Initial reading of the abstracts then took place, following which, the full texts of the articles of interest were procured. After complete reading, a second round of selections was performed, taking into account the criteria of inclusion and exclusion. In order to reduce selection biases, in cases where several publications reported on the same series, only the publication presenting the highest number of subjects was retained for further examination. The articles having gone successfully through the two stages of selection were included in the review.

Data collection and analysis

The pieces of information extracted from each study of interest were registered in a database using a standardized data collection support, namely an Excel table. The following parameters were recorded: first author and year of

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