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GENERAL REVIEW

Smoking and plastic surgery, part I. Pathophysiological aspects: Update and proposed recommendations



*Tabac et chirurgie plastique, partie I. Aspects
physiopathologiques : mise au point et proposition de
recommandations*

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Summary

Objectives. – Smoking patients undergoing a plastic surgery intervention are exposed to increased risk of perioperative and postoperative complications. It seemed useful to us to establish an update about the negative impact of smoking, especially on wound healing, and also about the indisputable benefits of quitting. We wish to propose a minimum time lapse of withdrawal in the preoperative and postoperative period in order to reduce the risks and maximize the results of the intervention.

Methods. – A literature review of documents from 1972 to 2014 was carried out by searching five different databases (Medline, PubMed Central, Cochrane library, Pascal and Web of Science).

Results. – Cigarette smoke has a diffuse and multifactorial impact in the body. Hypoxia, tissue ischemia and immune disorders induced by tobacco consumption cause alterations of the healing process. Some of these effects are reversible by quitting. Data from the literature recommend a preoperative smoking cessation period lasting between 3 and 8 weeks and up until 4 weeks postoperatively. Use of nicotine replacement therapies doubles the abstinence rate in the short

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MOTS CLÉS

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term. When a patient is heavily dependent, the surgeon should be helped by a tobacco specialist. *Conclusions.* — Total smoking cessation of 4 weeks preoperatively and lasting until primary healing of the operative site (2 weeks) appears to optimize surgical conditions without heightening anesthetic risk. Tobacco withdrawal assistance, both human and drug-based, is highly recommended.

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Résumé

Objectifs. — Le patient tabagique bénéficiant d'une intervention de chirurgie plastique est exposé à un risque majoré de complications péri- et postopératoires. Il nous semblait utile d'établir une mise au point sur le retentissement négatif, en particulier cicatriciel, du tabagisme et sur les bénéfices incontestables du sevrage. Nous souhaitons proposer un délai minimal de sevrage pré- et postopératoire en vue de réduire les risques et d'optimiser les résultats de l'intervention.

Méthodes. — Une revue de la littérature a été réalisée sur la période 1972–2014 en interrogeant cinq bases de données (Medline, PubMed Central, Cochrane library, Pascal et Web of Science).

Résultats. — La fumée de cigarette agit de manière diffuse et multifactorielle dans l'organisme. L'hypoxie et l'ischémie tissulaire ainsi que les désordres immunitaires induits par le tabac sont responsables de l'altération du processus cicatriciel. Une partie de ces effets est réversible au sevrage. Les données de la littérature conseillent un délai d'arrêt du tabagisme préopératoire situé entre 3 et 8 semaines et allant jusqu'à 4 semaines postopératoires. L'utilisation de traitements substitutifs nicotiques double le taux d'abstinence à court terme. Le chirurgien doit s'aider d'un tabacologue en cas de dépendance importante de son patient.

Conclusions. — Un sevrage tabagique total de 4 semaines préopératoires et jusqu'à la cicatrisation primaire du site opératoire, soit 2 semaines postopératoires, semble optimiser les conditions chirurgicales sans majorer le risque anesthésique. Un accompagnement du sevrage aussi bien humain que médicamenteux est recommandé.

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Introduction

Smoking is the first cause of preventable death in France, where in 2012 it was directly responsible for 73,000 deaths [1]. Tobacco consumption leads to increases in cardiovascular [2] and pulmonary [3,4] diseases, as well as high levels of mortality connected with the elevated incidence of different types of cancer.

Rapidly addictive, tobacco smoke has a diffused and multifactorial impact in the body. Its privileged targets are the cardiovascular apparatus and the central nervous system, in which nicotinic acetylcholine receptors have the property of being ubiquitous. The receptors are likewise present in the neuromuscular system as well as in leukocytes, lymphocytes, macrophages and the vascular endothelium [5,6]. In the long term, tobacco consumption has an inexorable impact on healing and tissue repair or regeneration. In surgical settings, these effects on the skin are a source of perioperative and postoperative complications. The problem is particularly preoccupying in plastic surgery, a speciality involving scar tissue in which esthetic and functional results are the foundation for success. In order to minimize risk, smoking cessation is clearly a necessary condition preceding intervention.

The objective of our first part is to comprehensively summarize the many different ways in which tobacco consumption affects the healing process. The indisputable benefits of quitting are spelled out in detail, and we propose a synthesis

of the currently available methods of achieving that goal. Do they indeed have a positive impact on healing? What could be the role of the electronic cigarette? Lastly, we wish to inform the reader about our recommendations on the most suitable time lapses for perioperative smoking cessation.

Materials and methods

A computerized literature review of documents dating from 1972 to 2014 was carried out on by searching five different data bases: Medline, PubMed central, Pascal, Cochrane library and Web of Science. Consultations continued through March 2014. The key words were "wound healing", "physiopathology", "smoking cessation", "nicotine replacement therapy", "smoking", "tobacco" and "nicotine".

Initial reading was carried out starting from titles and abstracts, after which the full text of articles of interest was obtained. Randomized controlled and observational studies were retained for further examination. English and French-language publications were included in our research.

Results

As regards the physiopathology of smoking, 1670 references were found. Following elimination of overlap and initial reading of the titles and abstracts, the complete texts of

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