Antibiotic Use in Facial Plastic Surgery

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KEYWORDS

• Antibiotics • Facial plastic surgery • Rhinoplasty • Facelift • Blepharoplasty • Implants • Resurfacing • Trauma

KEY POINTS

- Reported infection rates are low for most procedures, though reporting is confounded by inconsistent antibiotic regimens.
- Survey studies show a significant increase in the use of prophylactic antibiotics in facial plastic and reconstructive surgeries.
- Available literature is generally of low quality and inadequate to make a legitimate argument for or against antibiotic prophylaxis.

INTRODUCTION

The discovery of antibiotics marked one of the greatest milestones in human history. The advances that followed have saved countless millions of lives around the globe. These advances have contributed to the evolution of surgery from a practice that was used only when necessary, carrying great risk of death and morbidity, to what we know today. Cosmetic surgery may never have become as mainstream as it currently is if not for advances in prevention and treatment of infections.

Antibiotic use, however, is not without risk. Allergic reactions, side effects, opportunistic infections, increased health care costs, and most importantly the emergence of drug resistance have led many to question whether we are overusing antibiotics. The National Action Plan for Combating Antibiotic-resistant Bacteria developed in response to Executive Order 13,676 by President Barack Obama highlights the importance of this matter.[1]

In 1999 the Centers for Disease Control and Prevention issued the "Guideline for prevention of surgical site infection."[2] In their report, they advocate for the use of an antimicrobial prophylaxis agent for all operations or classes of operations in which its use has been shown to reduce surgical site infection (SSI) rates based on evidence from clinical trials or for those operations after which an SSI would represent a catastrophe. In the following sections the authors discuss the most commonly performed procedures in facial plastic surgery with one question in mind: Is antimicrobial prophylaxis indicated for these procedures based on the available literature?

Preoperative antibiotic administration is defined as any dose given before surgery; perioperative antibiotics are those given within 1 hour of incision and continuing less than 24 hours after the procedure, and postoperative antibiotics are administered 24 hours or more after surgery.[3]

SEPTOPLASTY/RHINOPLASTY

The nasal cavity comes into contact with everything we breathe and is well known to harbor bacterial pathogens.[2,4–6] Studies have demonstrated a clear correlation between nasal bacterial colonization and SSI in general.[6] But is the same true for nasal

Disclosures: Nothing to disclose.

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Facial Plast Surg Clin N Am 24 (2016) 347–356

http://dx.doi.org/10.1016/j.fsc.2016.03.011

1064-7406/16/$ – see front matter

surgery; is antibiotic prophylaxis indicated for these cases?

The incidence of postseptoplasty/rhinoplasty infection found in current literature fluctuates significantly between 0% and 18%, but in general 2% is considered acceptable.[7,8] Although indications are still a topic of debate, various survey studies have shown that, in practice, prophylactic antibiotic use is favored by most physicians performing rhinoplasty.[9–11] Lyle and colleagues[10] found a 200% increase in antibiotic prophylaxis use between 1985 and 2000. Despite their limitation of survey studies with relatively low response rates, these studies demonstrate that prescribing prophylactic antibiotics is becoming more common in today's rhinoplasty practice.

Table 1 shows studies that evaluated patients who did not receive any antibiotics.[12–15] The complication rate for this group fluctuated between 0% and 0.6%. If one looks at these data in isolation, one could make a compelling argument that risk of infection is so low that there is no need for antibiotics. However, 2 studies had well less than 100 patients, which limits their reliability and reproducibility.[13,14] Cabouli and colleagues[12] had larger numbers but were limited by recall bias; of the 12 patients who developed infections, only 5 were well documented. Interestingly, Yoder and Weimart reported a 0.48% (5 of 1040) infection rate without the use of antibiotics or surgical preparation solution.[15]

Table 2 shows studies that prospectively compared patients who received antibiotics with those who received either placebo or nothing at all.[16–19] All had low sample sizes, which limited their power. Three of the studies show no difference between groups, which would support the argument that antibiotic prophylaxis is not helpful. Conversely, Schäfer and Pirsig found a significant difference between groups, whereby the placebo group had a 27% (14 of 52) infection rate, whereas

Table 1
Rhinoplasty/septoplasty literature whereby no antibiotic prophylaxis was given

Authors	Infection Rate	Design	Results	Conclusions/ Recommendations
Okur et al,[13] 2006	0% 0 of 60	Examined 30 septoplasty and 30 open septorhinoplasty patients free of antibiotic ≥20 d	• Preoperative/ postoperative cultures negative • Intraoperative culture positive in 3 Rhinoplasty and 1 Septoplasty • 0 of 60 Had clinical evidence of infection	• Transient bacteremia develops during rhinoplasty. • Precautions should be taken in patients with high cardiovascular risk.
Yoder & Weimert,[15] 1992	0.48% 5 of 1040	1040 Patients with septoplasty/ septorhinoplasty without antibiotics or topical surgical preparation solution	• Minor nasal infection that resolved with antibiotics in 5 patients	• It is safe and acceptable to use no prophylactic antibiotic or surgical prep solution in Septoplasty/ Septorhinoplasty.
Cabouli et al,[12] 1986	0.6% 12 of 2000	Looked back at their last 2000 cases over 6 y without antibiotics	• 12 Cases of infection • Only 5 of which were well documented and reviewed in detail (limitation)	• The danger of drug toxicity exceeds the incidence of infection.
Slavin et al,[14] 1983	0% 0 of 52	Studied the incidence of bacteremia in patients free of antibiotics ≥2 wk before surgery	• 1 Positive culture • 0 of 52 Infections in 60-d follow-up period	• The value of perioperative antibiotic prophylaxis is questionable.