

## During Dental Surgery, Antibiotic Prophylaxis Seems Unnecessary to Reduce the Risk of Joint Implant Contamination

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### Abstract

Oro-dental caused bacteremia is more frequently linked to everyday activities like mastication than tooth extraction. There have been isolated cases of dental infection contaminating prosthetics, but epidemiological studies on joint implant bearers found that antibiotic prophylaxis during oro-dental surgery did not increase the rate of prosthetic infection. The effectiveness of dental antibiotic prophylaxis in immunodepressed patients was not determined by the analysis; however the risk of an infection with a prosthetic is reduced by 30% through oral hygiene and routine dental care. Which is against antibiotic prophylaxis during oro-dental surgery for implant bearers, regardless of implant duration or comorbidity: Costs and risks are out of proportion to effectiveness.

**Keywords:** Dental surgery; Antibiotic; Tooth extraction

### Introduction

Oro-dental-caused bacteremia is more frequently linked to everyday activities like mastication than tooth extraction. There have been isolated cases of dental infection contaminating prosthetics, but epidemiological studies on joint implant bearers found that antibiotic prophylaxis during oro-dental surgery did not increase the rate of prosthetic infection [1]. The effectiveness of dental antibiotic prophylaxis in immunodepressed patients was not determined by the analysis; however, the risk of an infection with a prosthetic is reduced by 30% through oral hygiene and routine dental care. Which is against antibiotic prophylaxis during oro-dental surgery for implant bearers, regardless of implant duration or comorbidity: Costs and risks are out of proportion to effectiveness [2,3].

Less than 1% of hip replacement bearers and between 1% and 2% of knee replacement bearers are affected by osteo-articular prosthetic infection (OAPI) [4]. In 30% of cases, it is hematogenous and typically has a urinary or cutaneous origin. A possible link between dental surgery and OAPI has been suggested in some reports. Antibiotic prophylaxis during dental treatment may therefore be recommended to prevent hematogenous prosthetic contamination in certain risky situations. Amoxicillin is recommended in this situation in France for patients with immunodepressed conditions and implants less than two years old. Despite the high costs and the risk of selecting resistant bacteria, no studies have demonstrated the interest in such prophylaxis.

During tooth extraction, bacteremia occurs at 100%. Within 30 seconds of extraction, intensity reaches a plateau lasting 10 to 20 minutes [5]. The incidence is lower for commonplace activities like brushing one's teeth or chewing gum (between 19% and 58%) but lasts for a longer period of time, proportional to the activity.

It is difficult to determine whether the bacteria in the secondary lesion and the dental site are similar. When a patient present to a doctor with a negative blood culture and an OAPI that suggests the presence of a microorganism thought to be of oro-dental origin: e.g., *Streptococcus* sp. (*mitis*, *salivarius*, *sanguinis*, *mutans* and *anginosus* among others). which are the primary species of strictly anaerobic bacteria found in oral flora (*Prevotella* sp., *sp. fusobacterium*, *Staphylococcus aureus*, etc.) either *staphylococcus* Age, local pH, oral hygiene, associated parodontitis, tooth decay, saliva quality, and other factors influence oral flora. Fortunately, local defenses prevent the bacteria from

spreading, and less than 1% of the bacteria in hematogenous OAPI are *S. aureus* or uro-digestive species (*Escherichia coli*, *Proteus* sp., *sp. salmonella*, *Streptococcus* sp., *Listeria*, etc.). Even in series with no antibiotic prophylaxis, prosthetic contamination as a result of oro-dental surgery is extremely uncommon.

### Literature Review

The molecule most frequently used for prevention is ampicillin; It decreased, but did not eliminate, the risk of bacteremia involving streptococcus or anaerobic bacteria when administered prior to oro-dental surgery [6]. Patients who received either a placebo or 2 g i.v. of *Streptococcus viridans* were more likely to develop bacteremia. one hour prior to dental surgery, penicillin or three grams of amoxicillin; Amoxicillin significantly reduced the risk of bacteremia (compared to placebo:) rates of *S. viridans* bacteremia were comparable in blood cultures taken before, during, and 15 minutes after the procedure (95 percent, 90 percent, and 85 percent, respectively). 84% versus 33%, administered either prior to or following tooth extraction (76% versus 15%) or postoperatively (20% versus 6%).

whereas tooth extraction resulted in low-intensity bacteremia lasting no longer than 6 to 30 minutes, daily tooth brushing and mastication caused bacteremia for 5370 minutes (3.7 days) per month in a subject with healthy teeth: Specifically, daily activities are 154,000 times more likely to cause bacteremia than tooth extraction. This is why subjects with poor oral hygiene have a much higher rate of spontaneous bacteremia than those with tooth extraction.

As a result, there is some debate regarding the connection between prosthetic infection and the length of a dental procedure. Only three

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of the 52 late infections found in a retrospective study of 2973 total hip replacements were associated with dental procedures (6%; 1 percent of hip implants); The procedure took longer than 45 minutes and the patients had not received any antibiotic prophylaxis. Only seven of the 62 infections that were observed in another series of 3490 knee replacements (11%; 0.2% of knee implants) were the result of dental procedures that did not include antibiotic prophylaxis and lasted between 75 and 205 minutes on average; Diabetes and rheumatoid arthritis were risk factors for five of the seven patients.

Lastly, the prevalence of prosthetic infection is unaffected by this antibiotic prophylaxis. The only prospective case-control study in the field found that patients undergoing dental surgery had the same risk of OAPI (for hip and knee implants). Antibiotic prophylaxis administered during tooth extraction did not lower the risk of OAPI (in hip and knee implants) in the same study with or without prophylaxis; In addition, antibiotic prophylaxis had no effect on OAPI risk following dental surgery in a subgroup with implants younger than one year [7].

## Discussion

Antibiotic prophylaxis for oro-dental surgery in joint implant bearers was not found to be effective, according to the current literature review [8]. The majority of studies were case reports or retrospective; the one prospective case-control study showed that there was no effectiveness; In order to evaluate efficacy in the immunodepression subgroup, statistical power was insufficient. There is insufficient long-term follow-up and information regarding the type of dental procedure and protocol (duration, with or without antibiotics) to draw a definitive conclusion.

For the purpose of reducing the incidence of bacteremia and OAPI, oral hygiene seems to be more significant. However, no specific guidelines have been established regarding the ideal frequency of oral dental examinations; one per year seems reasonable for maintaining healthy teeth.

## Conclusion

Antibiotic prophylaxis covering oro-dental surgery in joint implant bearers, regardless of immune status, has not been shown to be effective, and abstinence has not had any adverse effects, so French experts have suggested switching to guidelines for improving oro-dental hygiene instead.

## Acknowledgement

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## Conflict of Interest

None

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