

# Controversies in Dentoalveolar and Preprosthetic Surgery



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## KEYWORDS

- Controversies in dentoalveolar surgery • Third molars and periodontal disease
- Drug holiday in ONJ • Dental clearance for sepsis • Bone grafting the extraction socket

## KEY POINTS

- Identify scientific evidence and current consensus in evidence-based practice of dentoalveolar surgery.
- Explore the scientific evidence behind the fact that asymptomatic third molars can be responsible for progression of future periodontal disease.
- Clarify the rationale behind drug holidays in ONJ.
- Investigate the claim that dental disease can cause systemic disease.
- Inspect the current evidence and rationale for bone grafting extraction sockets.

## INTRODUCTION

Given that dentoalveolar surgeries are the most common procedures undertaken by oral maxillofacial surgeons, there are several controversies associated with many of its related aspects. Although good scientific evidence is the basis of most things oral maxillofacial surgeons do, some of what is accepted as common wisdom may not meet strict guidelines of evidence-based practice. This article explores some controversies that are relevant to the current practice of dentoalveolar surgery.

### THE THIRD MOLAR DEBATE: THE ASYMPTOMATIC THIRD MOLAR CAN CAUSE PERIODONTAL DISEASE IN THE FUTURE

It is only apt that we begin this article with the debate that seems to most consume the specialty: the third molar (M3) and the indications for removing the asymptomatic tooth.

A recent update on the prevalence of periodontitis in the US adult population using combined

data from the 2009 to 2010 and 2011 to 2012 cycles of the National Health and Nutrition Examination Survey estimates that in 2009 to 2012, a total of 46% of US adults representing 64.7 million people had periodontitis with 8.9% having severe periodontitis.<sup>1</sup> Most epidemiologic studies investigating periodontal disease tend to define periodontitis by combinations of clinical attachment loss and periodontal probing depth (PD) from six sites per tooth on all teeth, except M3. Therein lays the challenge when one attempts to investigate the relationship of partially impacted M3 on periodontal disease.

### *Seeking Clarity: Is There a Relationship Between Partially Impacted Third Molars and Progression of Periodontal Disease?*

Steed recently presented an elegant synopsis of the current evidence on the indications for removal of M3.<sup>2</sup> He summarized that “evidence based clinical data from prospective investigations show that an asymptomatic third molar does not necessarily reflect an absence of disease.”

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Strong scientific evidence suggests that significant periodontal pathology exists in the area of M3 and second molar (M2), especially when M3 was visible in the oral cavity.<sup>3</sup> Partially impacted M3 is associated with higher rates of periodontal disease, especially at M2 sites, even in asymptomatic patients. In fact, M3 may be the site of initial presentation of periodontal disease in many patients.

Research on periodontal pathogens in erupting or partially impacted M3 of otherwise periodontally healthy patients suggests that these sites harbor species of bacteria that cause severe periodontal infections. Species, such as *Porphyromonas gingivalis*, was positive even in 20% of the symptom-free cases. Studies that have looked at changes in periodontal status of mandibular M2 after surgical extraction of adjacent M3 suggest that removal of partially erupted M3 can improve periodontal health in younger patients.<sup>4</sup> Retained partially impacted M3s are associated with more severe periodontal disease in older patients.

### ***Periodontal Disease Associated with the Partially Impacted Third Molar***

Regardless of whether patients exhibit symptoms, there is significant evidence that partially impacted M3 is associated with increased PD around these teeth and distal to the M2. This increased PD is associated with attachment loss in nearly all patients, even young healthy adults with good periodontal health. However, there are several studies that suggest that if the PD is greater than 5 mm, there are elevated levels of inflammatory mediators present in the subgingival samples from these sites.

Studies of microbial colonization of partially erupted follicles show that these are populated by periodontal pathogens even in healthy subjects without evidence of periodontal disease. Numerous studies have implicated the same bacterial species found around a partially impacted tooth in local colonization leading to pericoronitis, upper respiratory tract infections, and possibly systemic invasion.

There is credible evidence that shows that the red and green bacterial complexes seen around M3s visible in the oral cavity may be responsible for initiation of periodontal disease in young healthy adults. These bacterial species have been detected at M2/M3 sites in otherwise periodontally healthy patients in larger quantities if the tooth is partially exposed in the mouth or if the PD is deeper. The presence of these complexes heralds a higher risk of progression of

periodontal disease at these sites. Furthermore, M3 periodontal pathology is a significant risk factor during pregnancy for progression of generalized periodontal disease. In studies that have investigated periodontal pathology in older patients, the presence of partially erupted M3 was associated with more severe periodontal disease.

The elimination of a partially impacted M3 eliminates a focus for periodontal pathogens at these sites. An improvement of periodontal health distal to M2 in particular and the posterior quadrant in general has been suggested by researchers who have looked at this following removal of M3 in young periodontally healthy patients. They have found a positive effect on generalized periodontal health and demonstrated gain in distal M2 alveolar bone following extraction of M3.

### ***A Consensus?***

Although the term “partial impaction” or “partial visibility” in the oral cavity may be applied to any M3, maxillary or mandibular, a thorough review of the literature that pertains to scientific studies on the subject reveals that most investigations focused on the mandibular M3 and extrapolated that data to the maxillary M3. However, clinicians are aware and accept that the far reaches of the oral cavity, whether in the maxilla or the mandible, remain limited in access to cleansing and tend to attract more plaque and debris deposition.

Dodson<sup>5</sup> developed a practical guide for clinicians to establish the presence or absence of disease in light of presence or absence of symptoms. The system exposes that the absence of symptoms does not necessarily mean the absence of disease.

Partial impaction or partial visibility is associated with increased PD around M3. White and coworkers<sup>6</sup> found that this increased PD and associated loss of attachment in nearly all patients. In a related study,<sup>7</sup> they found that a cross-sectional analysis of data from healthy young adults with periodontal pathology was detected more frequently on asymptomatic M3s compared with first/second molar teeth; caries experience was detected more frequently on first/second molars compared with M3s. Their extensive work spanning a wide spectrum of clinical scenarios led to findings that the prevalence of periodontal pathology with erupting M3s or a visible M3 was almost three times greater compared with M3s below the occlusal plane.<sup>8</sup> Furthermore, there was significantly elevated levels of inflammatory mediators present if the PD around these M3s was greater than 5 mm. While looking for microbial complexes in the

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