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REVIEW PAPER

Third Molars: A Threat to Periodontal Health??

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Abstract The third molars have received the fair amount of interest in literature. It has been blamed for problems such as—lower incisor crowding, atypical facial pain, caries etc. They are considered as 'waste bins' in dental practices as they are regarded as functionally non-essential. While making the clinical decision, they are given less importance and often extraction is considered to be the treatment option. Despite periodontal problems that can arise with extracted third molars, retention of third molars can also lead to periodontal problems with the adjacent teeth in addition to teeth farther to third molars. Of late, it is very important to consider the periodontal problems while making the clinical decision. This review paper has been discussed keeping this as prime objective.

Keywords Third molar · Periodontitis

Introduction

Over the years the humble wisdom tooth has come in for a fair amount of attention in the literature. This mass of dentin and enamel, essentially the same as any other tooth in the dentition has been blamed for problems such as lower incisor crowding, atypical facial pain, caries and even disorientation in air crew.

In yester years, third molars were extracted due to infection as preventive measure. With the advent of antibiotics, this is now unnecessary and outmoded. Third molars were retained in those patients who were susceptible to some forms of periodontal disease in whom first molars were lost at an early age in argument that third molars act as 'spare tyres' of molar tooth loss and can be used as abutments for bridges at later stage.

The therapeutic recommendations with regard to third molars are critical. The clinical decision making to retain or remove the third molars always appears questionable. It is not just the presence or absence of symptomatic or asymptomatic third molar that makes the decision difficult but sometimes the consequences that follow with either of it. One needs to consider the endodontic, prosthodontic, surgical, periodontic, orthodontic prognosis of third molar. It is this inter-disciplinary concern that makes the clinical decision difficult and needs to be totally weighed.

Thus, many dental practitioners do not attach significance to the presence of third molars when making therapeutic recommendations to patients about preservation of the dentition. However, the need for taking a more serious account of third molars and its relation to periodontal health is reviewed in this paper.

Genesis of Wisdom Teeth

Eruption of the third molars occurs in the later teenage years through the early 20 s. Timing of the eruption varies widely. Eruption can be seen as early as 13–14 years of age, and follows root development. Conversely, it is also possible for delayed root formation to occur, and result in incomplete development of impacted wisdom teeth or late eruption. The third molar is the last to develop in the dental arch. Typical development of the third molar tooth germ begins around the age of 8–9 years with radiographic

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appearance distal to the second molars. The crown is visible by 14 years of age and root formation is generally considered to be nearly complete by the age of 20–21 years [1].

The ability to predict with a degree of accuracy the potential for eruption of the third molar would allow for much more controlled template for determining the need for removal. A number of radiographic techniques to assess the potential for impaction of the third molars exist. In spite of these varied techniques, there remains a degree of uncertainty with regards to the definitive ability to predict complete eruption of the third molars.

Reasons for third molar removal [1]

1. Pericoronitis
2. Periodontal disease
3. Prevention or management of caries
4. Root resorption of adjacent teeth
5. Orthodontic considerations
6. Systemic health considerations
7. Prevention or management of odontogenic cysts
8. Management of odontogenic tumours
9. Preparation of orthognathic surgery
10. Economic considerations

A number of studies have looked into the impact of removal or retainment of third molars on the periodontal status of the adjacent second molars. The vast majorities of these studies focuses on the mandibular third molars, and are assessed on the basis of attachment levels, pocket depths and bone levels on the second molars. The important question as to whether the mere presence of third molars, asymptomatic or otherwise will definitely result in the risk of adjacent teeth developing periodontitis is yet to be answered. The difficulty is that historically, many studies have excluded third molars from findings, on the basis that reproducibility of measurements within studies is limited by the ongoing development of the third molars. These assumptions have been shown to lack true validity, and there are ongoing studies to assess the prevalence and severity of periodontitis as a result of the presence of wisdom teeth.

Most of the times, the dentist opts for extraction of third molars as a treatment modality. Third molars are often sacrificed without giving the second thought whether the tooth is impacted or fully erupted, carious or any pathology present. Of concern is that problem won't end here and instead may give rise to. Third molars have been described as different from other teeth in the oral cavity. They have the highest rate of developmental abnormalities and, most importantly, are last in the eruption sequence. Caries and periodontal diseases occurring in relatively older age group were the major reasons for non-surgical extraction of third molars while recurrent pericoronitis occurring in relatively younger age was the major reason for surgical extraction of impacted third molars [2].

Prophylactic surgical extraction of third molars is not a common practice in our environment. Surgical removal of impacted lower third molars is widely carried out in general dental practice and in many institutional clinics. Despite the fact that there are well established indications for the removal of impacted lower third molars, prophylactic removal of these teeth is still being universally practiced. Some reports have estimated that the proportion of impacted third molars that are removed when no clinically sound justification for surgery is present is between 18 and 50.7%. Justifications for prophylactic surgery include the need to minimize the risk of disease (cysts and tumors) development, reduction of the risk of mandibular angle fracture, increased difficulty of surgery with age, and that third molars have no definite role in the mouth [3].

Although all those with retained third molars are not at increased risk, the summary data reported suggest that those with a visible third molar are more likely to have greater periodontal probing depths overall, particularly on second molars, and a greater surface area of the biofilm-gingival interface compared with those with no visible third molar [4].

Most subjects had clinical evidence of caries experience or periodontal pathology on visible third molars; few subjects had visible third molars that were disease free. Subjects with periodontal pathology or caries experience on third molars were significantly more likely to have these findings detected on teeth more anterior in the mouth [5]. The finding of more severe periodontal conditions associated with visible third molars in the young adults indicates that third molars may have a negative impact on periodontal health [6]. The relationship between third molars and periodontal disease pathogenesis deserves further study using longitudinal data. In the absence of good evidence to support prophylactic removal, there appears to be little justification for the removal of pathology-free impacted third molars [7].

Studies have concluded the incidence of deep periodontal pocket in second molar after removal of third molars. Daniel Richardson and Thomas b. Dodson [8] studied the risk of periodontal defects after third molar surgery and found that 48% had worsening of their periodontal measures after third molar removal who had healthy periodontal status preoperatively. Other studies correlating to these findings are Ash et al. [9], Chin quee et al. [10], Osborne et al. [11]. In contrast to this, there was improvement in periodontal conditions of second molar following the removal of third molar and were reported in studies by Pecora et al. [12], Grondahl and Lekolm [13].

The mere presence of third molars also had shown negative impact on periodontal health. It is not just a sigh

of relief when third molars have completely erupted in the oral cavity and are present as asymptomatic tooth, because there is prevalence of periodontal pathology associated with asymptomatic third molars too. John R. Elter et al. [14] have conducted the study with the goal to assess the association between the presence of visible third molars and periodontal pathology in a community dwelling sample of middle aged and older adults and concluded that the visible third molar was associated with 1.5 times the odds of increased pocket depth on the adjacent second molar. Similarly, George H. Blakey et al. [15] have also reported the unexpected results as 25% of patients in their study showed considerable periodontal pathology in the posterior region with retained asymptomatic third molars.

The impact of the presence, removal and pathologic changes associated with wisdom teeth on the periodontal health of patients is a long-standing issue, and emerging evidence of the possible association of periodontal disease and systemic health makes this a potentially more urgent issue to understand.

Advances in science and technology over the last century have greatly expanded our knowledge of the pathogenesis of periodontal diseases. Periodontal disease is an infectious disease, but environmental, physical, social and host stresses may affect and modify disease expression. Certain systemic conditions clearly may affect the initiation and progression of gingivitis and periodontitis. Systemic disorders affecting neutrophil, monocyte/macrophage, and lymphocyte function result in altered production or activity of host inflammatory mediators. These alterations may manifest clinically as early onset of periodontal destruction or a more rapid rate of destruction than would occur in the absence of such disorders.

Evidence has also shed light on the converse side of the relationship between systemic health and oral health, that is, the potential effects of periodontal disease on a wide range of organ systems like cardiovascular, cerebrovascular system, endocrine system, reproductive system and respiratory system.

The concept of periodontal diseases as localized entities affecting only the teeth and supporting apparatus is oversimplified and in need of revision. Rather than being confined to the periodontium, periodontal diseases may have wide-ranging systemic effects. In most persons, these effects may be relatively inconsequential or at least not clinically evident. In susceptible individuals, however, periodontal infection may act as an independent risk factor for systemic disease and may be involved in the basic pathogenic mechanisms of these conditions. Furthermore, periodontal infection may exacerbate existing systemic disorders.

In more recent developments, a series of long-term trials focusing on systemic health risks has found that greater periodontal probing depths (>5 mm) are associated with the presence of visible third molars [1]. Third molar periodontal pathology appears to be a significant risk indicator for periodontal disease progression during pregnancy [16]. Women of child-bearing age should be made aware of the systemic risks of oral inflammation with third molar periodontal pathology [17].

In recent literature from a 2007 study, an association with progressive periodontal disease on non-third molar teeth was found around patients with asymptomatic third molars. Measurements such as pocket depth and bleeding were found to increase around first and second molars over a 4-year period, leading to the suggestion that asymptomatic wisdom teeth can, in certain circumstances be potentially classified as a chronic health risk, given the association of periodontal disease with systemic health issues [1].

It is important to provide appropriate treatment and prevent the disease occurrence and progression. Thus, in patients with systemic diseases, pathological third molar needs to be indicated for extraction and asymptomatic third molars can be retained which may be useful for interdisciplinary treatment.

Conclusion

It is tempting to conclude that worsening of periodontal conditions is seen with the removal of third molars and so also with retainment of asymptomatic wisdom tooth. It is not only the negative impact of periodontal health that is seen but also there is improving of periodontal condition with the removal of third molar as a positive impact too. Perhaps, both periodontal and surgical literature lacks evidence of support to make any straight statements and more longitudinal studies comparing the periodontal health and third molars are needed. Therefore, one should be circumspect while making clinical decision with third molars and periodontal condition should always be weighed for as patients need specific help.

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