

THIRD MOLARS AND LOWER INCISOR CROWDING

Introduction

When children and adolescents undergo orthodontic treatment, their appliances are usually removed prior to the eruption of their third molars (wisdom teeth). The prevailing theory has historically been that if enough room for complete eruption of these teeth does not exist in the mandibular arch, later eruption or impaction of the third molars will push the mandibular teeth forward leading to crowding of the lower anterior segment during retention.

Literature Review

Dewey first described the role of the third molar in causing crowding of the mandibular incisors in 1971. According to Dewey, "the mandibular third molar will become impacted (in some cases) due to lack of space", while in other cases "it creates space for eruption by causing the lower anterior teeth to crowd". This article set the stage for a controversy which still exists today.



Fig 1: Note a supernumerary fourth molar on lower right side.

In 1961, Bergstrom and Jensen completed a study of 60 subjects with unilateral third molar agenesis, concluding that greater crowding occurred in quadrants which had third molars present. Schwartz in 1975, compared 56 patients who had third molar tooth germs moved to 49 who had complete development of third molars, and concluded that more frequent crowding of mandibular incisors was the result of the sagittal force exerted by the third molars. Lindquist and Thilander supported these findings in 1982, based on their study 52 patients receiving unilateral third molar extractions, although they were unable to predict which patients would react favorably to these extractions.

Several authors have published data showing that third molars actually have a minimal effect, if any, on lower incisor crowding in the years following completed orthodontic therapy. Shanley, in a study of 44 patients with third molars either impacted, erupted, or congenitally missing, found no significant difference between the groups. Likewise Lundstrom and Kaplan could find no connection between erupted, impacted, or congenitally missing teeth third molars and arch dimension changes. Other researchers have also come to the conclusion that there is no connection between third molars and lower incisor crowding.

In the most recent study, Ades and co-workers have attempted to settle the controversy regarding long-term changes in the mandibular dental arch and the presence or absence of the mandibular third molar. They looked at the pretreatment, post treatment, and post retention study models and lateral cephalometric radiographs of 97 patients. These patients either had erupted, impacted, congenitally absent, or previously extracted third molars. All patients had been followed for at least 10 years after retention. **In general, for all groups mandibular incisor irregularity usually increased, while arch length and intercanine width typically decreased.** No correlation could be found between the presence or absence of mandibular third molars and lower incisor crowding. Further, no significant differences in mandibular growth could be found between the subgroups. The authors concluded that **“recommendation for mandibular third molar removal with the objective of alleviating or preventing long-term mandibular incisor irregularity may not be justified.”** As noted by Proffit, erupting teeth create a pressure of only 5 to 10 grams; thus it is difficult to understand how a pressure of that a light a magnitude, exerted at the posterior part of the arch, could cause crowding in the anterior part of the arch.



Fig 2: Lower incisor crowding in an adult. May be the influence of late mandibular growth.



Fig 3: Note lower incisor crowding and fully erupted lower third molars on Panoramic X-ray.

Effect of Late Growth

While the rate is very slow, Behrents has noted that late growth of the mandible occurs into adulthood. Such growth could provide a general explanation for late mandibular incisor crowding. For patients with a tight anterior occlusion prior to late differential mandibular growth, the contact relationship of the anterior teeth must change if the mandible grows forward. One of three events will occur: 1) the mandible is displaced distally, accompanied by a distortion of the structures of the temporomandibular joint; 2) the upper incisors flare forward, opening spaces; or 3) the lower incisors displace distally, creating crowding because the lower arch fits inside the upper arch like a telescope, thus its circumference is contained. While all of these responses occur, **distal movement of the lower incisors with concomitant crowding has been reported as the most common response.** Lip and tongue pressures may also have an effect on the outcome of this late growth.

Discussion

The reality is most people simply do not have enough room in the maxilla or mandible for the four third molars to erupt fully and to function properly. In many patients, these teeth are partially impacted and covered with an operculum, providing an excellent sanctuary for bacterial infection.

Further, while third molars do not appear to exert a significant forward pressure on the anterior teeth, it may be possible that they help prevent the posterior movement of mandibular teeth as an adaptation to late mandibular growth. If the mandibular teeth are allowed to shift distally, it is possible that lower incisors might be able to upright without crowding. It is important to note, however, that crowding of lower incisors occurs even in patients with no third molars at all.

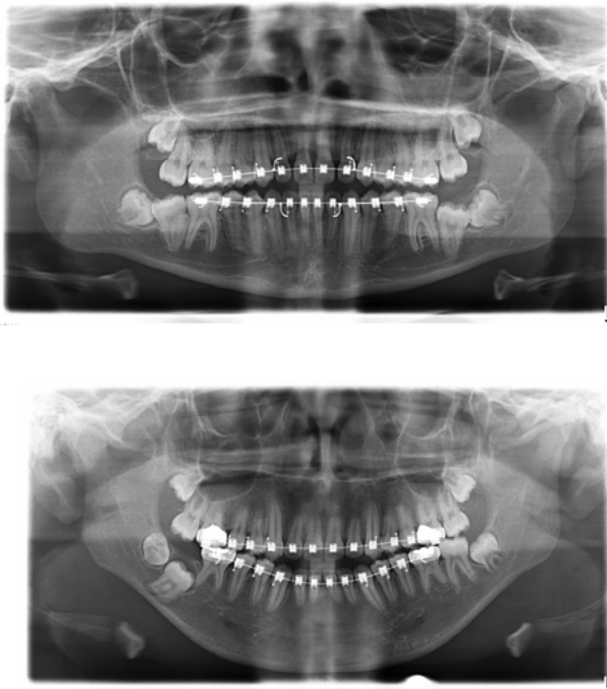


Fig 4 : Panoramic X-ray. Third molars are disrupting eruption of second molars.

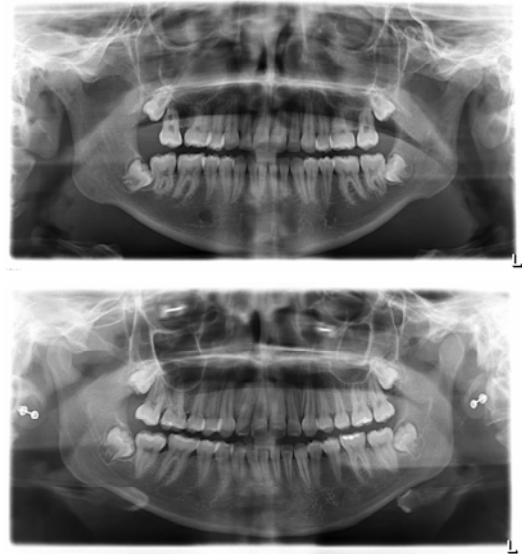


Fig 5: There is not enough room for the lower third molars to erupt and function normally.

Conclusion

Considerable controversy exists regarding the role of the third molar in mandibular incisor crowding. **Historically, it has been assumed that the push of the third molar resulted in mandibular incisor crowding. The latest evidence does not support this theory; rather, it may be the influence of the late mandibular growth which results in incisor crowding.**

Many patients will have third molars removed for a variety of reasons. While most will not have enough room for them, their removal does not guarantee increased stability of the post orthodontic result.

Long term retention until all growth has ceased is recommended for most orthodontic patients. This requires a cooperative effort between the orthodontist, patient, and dentist.

References

1. Richardson, ME, The development of Third Molar impaction. Angle Orthod 1975; 2: 231-4
2. Bergstrom, K. and Jensen R.: Responsibility of the third molar for secondary crowding. Dent. Abstr. Vol.6, p544, 1961.



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Tongue Thrust: Orthodontic Considerations.

Q U I Z

1. T F In past studies, mandibular incisor irregularity usually increased, while arch length decreased.
2. T F It is recommended that third molars be removed to prevent mandibular incisor crowding.
3. T F Mesial movement of lower incisors occurs with late mandibular growth.
4. T F Most people do not have room for maxillary or mandibular third molars.
5. T F In the past it was assumed that the push of the third molar resulted in mandibular crowding, but today the influence of late mandibular growth results in incisor crowding.