

## Original Research

### Assessment of effect of third molars on lower anterior crowding

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#### ABSTRACT:

**Background:** To assess the effect of third molars on lower anterior crowding. **Materials & methods:** A total of 10 cases were enrolled. The CBCT images of the 10 cases were collected and studied. These images were divided into two groups: A, in which the 3rd molars were absent, and B, in which the 3rd molars were present, with 5 images in each group. The linear measurements were summed up to obtain Little's irregularity index score for that sample. SPSS software was used for statistical analysis. Descriptive statistics and Pearson's correlation test were performed to assess the effect of mandibular third molars and mandibular anterior crowding. **Results:** A total of 10 CBCT images were enrolled. Group A, in which 3rd molar were absent indicated moderate irregularity and group B, with presence of 3rd molars indicated severe irregularity. **Conclusion:** There is positive effect of mandibular third molars on the lower anterior crowding.

**Keywords:** third molar, lower anteriors, crowding.

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#### INTRODUCTION

Malocclusion is one of the most commonly encountered abnormalities in human dentition. It is the malalignment of the teeth relative to each other and with the surrounding structures. Malocclusion can arise due to various etiological factors and is not related to the teeth only. Any deviation in the skeletal and soft tissue integrity can lead to malocclusion. Malocclusion is more of a developmental disturbance rather than a disease.<sup>1</sup> Whether third molars contribute to or aggravate the relapse of dental arch alignment, particularly in the mandibular dental arch, after orthodontic treatment remains controversial. Several studies have reported inconsistent findings. And orthodontic clinicians vary greatly in their practice regarding prophylactic removal of third molars after orthodontic treatment.<sup>2,3</sup>

Many articles are available about this topic in the literature. Bergstrom<sup>4</sup> in 1961 was one of the first authors to analyze the influence of the third molar in the developing dental arch and to say that there was a relationship between the teeth and the incisor change. Vego 1 year later concluded that the eruption of lower third molars could exert a force on the neighboring teeth.<sup>5</sup> More recently, Lindqvist maintained that the

eruption would create a pressure toward the anterior teeth.<sup>6</sup>

The CBCT technique relies on the principles of tomosynthesis.<sup>7</sup> The CBCT scan involves an x-ray source and an opposing x-ray sensor that rotates around the patient's head to record a series of images in the form of slices called voxels. These slices are then reconstructed into a three-dimensional image using mathematical algorithms.<sup>8</sup> CBCT produces less radiation exposure than the CT scan technique and is hence ideal as an imaging modality in dentistry. Since impacted teeth can easily be visualized on a CBCT image along with the normal dentition, the records obtained from this imaging modality were selected for this study. Hence, this study was conducted to assess the effect of third molars on lower anterior crowding.

#### MATERIALS & METHODS

A total of 10 cases were enrolled. The CBCT images of the 10 cases were collected and studied. These images were divided into two groups: A, in which the 3rd molars were absent, and B, in which the 3rd molars were present, with 5 images in each group. The images were viewed from the axial dimension to calculate mandibular incisor crowding. The images

were adjusted in the axial view to the point where the incisal edges and the contact points of mandibular incisors were barely visible. The points were manually plotted from the mesial incisal edge of one tooth to the distal incisal edge of another tooth to make linear measurements. Such points were plotted from the mesial incisal edge of the left mandibular canine to the mesial incisal edge of the right mandibular canine. The linear measurements were summed up to obtain Little’s irregularity index score for that sample. SPSS software was used for statistical

analysis. Descriptive statistics and Pearson’s correlation test were performed to assess the effect of mandibular third molars and mandibular anterior crowding.

**RESULTS**

A total of 10 CBCT images were enrolled. Group A, in which 3rd molar were absent indicated moderate irregularity and group B, with presence of 3rd molars indicated severe irregularity.

**Table 1: little's irregularity index scores**

Sample	Group A ( 3rd molar absent)	Group B (3rd molar present)
1	0.30	7.50
2	3.36	18.85
3	0.00	5.05
4	1.32	1.62
5	4.02	13.36

The results for Pearson’s correlation test were analysed. There was a positive correlation between groups A and B, which was statistically significant P = 0.03), indicating an association between the presence of mandibular third molar and mandibular anterior crowding.

**Table 2: Pearson's correlation test**

		Without 3rd molar	With 3rd molar	P - value
Without 3rd molar	Pearson's correlation	1	0.4	0.03
	n	5	5	

**DISCUSSION**

The relation between third molars and dental crowding has not yet been clarified in the literature. Clinicians have always been divided between supporters and opponents of anterior dental crowding produced by the force generated by the third molar eruption. For the same reason, the surgical prophylactic approach for the third molar has always been seen as the cure by the former and a ‘placebo’ by the latter.<sup>9</sup> In this study, a total of 10 CBCT images were enrolled. Group A, in which 3rd molar were absent indicated moderate irregularity and group B, with presence of 3rd molars indicated severe irregularity.

A study by Husain S et al, consisted of 40 samples of CBCT images divided into two groups (n=20). Group A comprised CBCT images without third molars, and group B included CBCT images with third molars. The images were observed in the axial view and manually marked to calculate the amount of crowding using Little’s irregularity index. The obtained values were statistically analyzed using Pearson’s correlation test. SPSS 23 was used for statistical analysis. The results showed a positive correlation between the mandibular third molars and mandibular incisor crowding, which was significant (P = 0.033). The mean Little’s irregularity index score for groups A and B were 4.26 and 6.799, respectively (P = 0.033).<sup>10</sup> In this study, the results for Pearson’s correlation test were analysed. There was a positive correlation between groups A and B, which was statistically significant P = 0.03), indicating an association

between the presence of mandibular third molar and mandibular anterior crowding.

Another study by, Ades et al reported an increase in the incisor irregularity and decreased arch length and intercanine width with aging. However, the role of the third molar in this event is not significant, and it does not necessitate the extraction of third molars for the sake of retention.<sup>11</sup> Niedzielska used Ganss ratio and measured the crowding and arch length to determine an association between third molar and incisor crowding and supported the third molar extraction.<sup>12</sup> Lindqvist and Thilander reported 70% crowding on the side of the arch with a third molar compared to the side without a third molar.<sup>13</sup>

The impact and association of third molars in the occurrence of late incisor crowding have been a topic of interest for orthodontists and oral surgeons alike. According to a study by Lindauer et al, orthodontists believe that third molars are not responsible for incisor crowding. In contrast, surgeons believe that the third molars are responsible for late incisor crowding, advocating the prophylactic extraction of the third molars for this very reason.<sup>14</sup> A similar survey between American and Swedish orthodontists showed that both believed that the erupting third molars exerted an anterior force. They were also believed that they rarely or never caused crowding.<sup>15</sup> Another study by Niedzielska I et al, changes in dental arch dimensions were assessed in 47 patients (36 females, 11 males) three years following either removal of the third molars or deciding to leave them in situ. A dental pantomogram (DPT) was taken at the start of the study and plaster study models were

obtained at both the beginning and end of the observation period. The results showed that the measurements of crowding and arch length and width had changed in 12 lower and two upper dental arches. The relationship between these results and the Ganss ratio was statistically significant. Calculation of the Ganss ratio may therefore assist investigations into the development of dental arch crowding and also help determine the indications for third molar removal.<sup>16</sup>

## CONCLUSION

There is positive effect of mandibular third molars on the lower anterior crowding.

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