

**TIMING FOR CROWDING CORRECTIONS WITH THE
OCCLUS-O-GUIDE® AND NITE-GUIDE® APPLIANCES**

Although timing is not as critical for the Occlus-o-Guide® appliance as it is with the Nite-Guide®, it is still nonetheless of great importance. To correct crowding with the Occlus-o-Guide® when only permanent teeth are present limits its treatment possibilities considerably. One of the problems is that there is often little or no room for the correction of crowding. Since there are no interproximal spaces present between the permanent teeth once they are all closed in an anterior direction following the second permanent molar eruption. Creating additional space in a crowded lower permanent arch has traditionally been very difficult with not much promise for long-term stability.¹ Several possibilities exist but none are very acceptable. One can;

- a. expand the arch;
- b. distalize the posterior teeth;
- c. strip interproximal surfaces;
- d. extract permanent teeth;
- e. simply move the lower incisors labially;
- f. overlap the canines and laterals.

Expansion in the lower arch is very limited unless the lower anterior and/or posterior teeth are excessively lingually-inclined. The Occlus-o-Guide® on it's own will not create expansion in the posterior segment. In the anterior segment, however, lingually inclined lower incisors can be slightly uprighted with the Occlus-o-Guide® providing some additional space. Lower incisors that are not inclined lingually will not be proclined labially when the appliance is worn actively at least two hours per day.² and where sufficient room for the incisors is present or provided. If no room for the crowded incisors has been provided, these teeth will be labialized and therefore the Occlus-o-Guide® is not recommended in such cases. Distalization of the molars will usually not stay either³ and to move the lower incisors labially is not a recommended procedure due to the possibility of creating gingival recession⁴. Stripping or disking of the incisors tends to be a temporary measure since the same crowding usually returns. For these

several reasons, treatment with the Occlus-o-Guide® (or any other removable or fixed appliances) in the adult dentition with closed contacts, can only be recommended when a very limited amount of crowding is present (1 or 2 mm.) Anything beyond this amount (Fig. 1) risks loss of labial bone on the lower incisors with gingival recession and/or relapse of the correction when the treatment is discontinued. In fact, research indicates about 75% of crowding corrected with fixed appliances at 11 or 12 usually relapses in such cases long-term and does not diminish even with extraction therapy¹.

TREATMENT TIMING GROWTH WITH THE OCCLUS-O-GUIDE®

APPLIANCE:

The most promising method, other than guiding the permanent incisors at 5 to 7 years of age with the Nite-Guide® technique^{5,6}, is to treat these cases during the mixed dentition before the exfoliation of the deciduous molars and before the upper and lower first permanent molars have migrated in an anterior direction⁷ following the forceful eruption of the mandibular second molars. Since the lower deciduous canine and first and second deciduous molars are 2.5 mm. larger mesio-distally (1.4 mm. larger on each side of the upper) than the permanent canine and the first and second premolars⁸ there is additional space (about 2 mm. per side) present for crowding corrections at this early age which is not present in the permanent dentition. If the timing of the Occlus-o-Guide® treatment is such that it can start at least before the second deciduous molars are lost, valuable space for the crowding correction of up to a total (both sides) of 4 mm. is obtained. **The best time, however, is to start as the lower deciduous canines are lost** (Fig. 2). In this way, space can be obtained for the crowded lower incisors from the larger deciduous posterior teeth which can either be sequentially stripped or extracted. Extraction, however, is generally not recommended, since, as the first permanent molars might migrate mesially closing the needed leeway space. As each of the permanent canines and premolars break tissue, they are forced to erupt distally into the space created preferably by sequentially stripping each of the deciduous teeth immediately posterior to the newly-erupting permanent tooth, prior to its complete eruption.

It is, therefore, important to start crowded cases before the larger posterior deciduous molars exfoliate. One can, therefore, start treatment anytime before or after the time of the exfoliation of the first lower deciduous canine to just before the time of the loss of the second deciduous molar (upper or lower, depending on which arch has the crowding). Always resist extracting deciduous canines and deciduous molars unless they are almost ready to be exfoliated. When one removes deciduous teeth before the permanent replacement crown has reached the top of the alveolus, it will often retard the appearance of the erupting permanent tooth in the tissue^{9,10}. This is possibly due to the retention of cortical bone over the crown of the unerupted tooth or to the formation of scar tissue which occurs when the erupting permanent tooth is not ready to come through tissue at the time of the deciduous tooth extraction. This same scar tissue might also cause erratic eruption of the permanent tooth, frequently complicating rather than helping a case. There are exceptions, at times, such as extremely crowded cases or retarded eruptions, or ankylosed deciduous teeth, but for the most part, one should strip or disk the deciduous teeth to provide room rather than extract them.

There are, however, several reasons for starting treatment with the Occlus-o-Guide[®] appliance at the time of exfoliation of the lower deciduous canines. The major reason for this timing is due to the ability to strip the deciduous molars distal to each erupting permanent tooth. (As the canine erupts, the mesial of the first deciduous molar can be stripped and as the first premolar erupts, the second deciduous molar can be stripped.) In this way the crowding will correct in a distal direction without causing the incisors to become labialized². Also if the canine is erupting rotated, the appliance can guide and rotate the tooth due to lack of developed collagenous fibers, which tend to prevent similar rotation once the tooth is fully erupted and these adult collagenous fibers are more developed and restrictive to tooth movement. Another significant reason for starting at the time of lower canine eruption is that the maximum number of opposing permanent teeth will be erupting prior to fiber formation (eight opposing teeth per side) which aides in stabilizing the overbite correction. Another is that a perfectly level posterior plane of occlusion is established by controlling the vertical position of each permanent tooth as they erupt.

TREATMENT TIMING WITH THE NITE-GUIDE® APPLIANCE:

Since the principles of crowding correction with the Nite-Guide® appliance depends on arch enlargement by forcing the incoming permanent incisors to erupt without rotations or crowding, it is important that the appliance is used during this eruption⁶. This is in contrast to the use of the Occlus-o-Guide® appliance where space for the crowding correction only comes from utilization of the leeway space. Since the leeway space exists during the whole mixed dentition stage from about 8 to 10 or 11 years of age, there is a period of 2 to 3 years where the treatment could be initiated. With the Nite-Guide® techniques the natural lower arch expansion occurs at two distinct times. The first is during the lower adult central eruption and the second is during the lateral eruption. If a child is started after the centrals have already erupted, the total expansion possible is reduced by about 1.5mm, with a total average expansion of 2.5mm. If the appliance is started as the lower centrals begin their eruption, the mean total arch increase is 4.0mm. If the same treatment procedure begins after the laterals are fully erupted, no such expansion takes place.

Timing, therefore, becomes very critical and should start as the lower permanent centrals first break through tissue. If, on the other hand, the appliance use is begun prior to the eruption of the centrals, no expansion takes place until the centrals begin their ascent into the mouth and will continue until the lower laterals are fully erupted for about six months. Overbite prevention with the Nite-Guide® appliance is also critical in its timing to coincide with at least the full eruption of the lower incisors. Therefore, the overbite prevention can be started at a slightly later time than the crowding prevention. In fact if the mandibular centrals are already overerupted into position before the appliance use is started, it can still be successful, provided the child actively exercises (clenches) for about one hour per day, which can effectively depress these teeth prior to the full eruption of the upper incisors.

References:

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FIG. 1 - This case exceeds the limits of crowding in the adult dentition. The Occlus-o-Guide® should not be used in this case because there is no space available for the correction of the crowding (3mm.). If additional space can be created with the use of a bumper, sagittal appliance, etc., then the Occlus-o-Guide® could be used to advantage.

FIG. 2 - This is the ideal time to start treatment with the Occlus-o-Guide® appliance as the lower permanent canine begins to erupt.

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