

Crowding and Rotational Corrections with the Occlus-o-Guide® Appliance

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The Occlus-o-Guide® is a preformed appliance designed in 13 graduated sizes for the mixed dentition and the same number for the permanent dentition^{1,2,3}. Since the sizes of the adult teeth are highly correlated in any one individual, it is possible to predict the sizes and shapes of teeth sufficiently to design an appliance that can accurately guide teeth as they erupt into the mouth. Therefore, the Occlus-o-Guide® is designed in uniformly graduated sizes that can be selected by measuring the mesiodistal widths of the incisors. The pointer of the measuring guide is placed at the distal of the upper left lateral incisor (Fig. 1a), and bent along the incisal edges to the distal of the right lateral incisor (Fig. 1b). The measured size in the example is a 5 1/2 G (if a mixed dentition case) and a 5 1/2 N (if a full adult dentition case). The Occlus-o-Guide® appliance is shown in the mouth in Figure 2. In a crowded case it is always better to have the appliance fit exactly or slightly larger than the teeth measured, while in a case with spacing the appliance should fit exactly or slightly smaller. The ruler as seen in Figures 1a and b can also be used in a similar way in the lower arch.

Because of the leeway space, where the deciduous molars are larger mesio-distally than the premolars that replace them, about 4 mm. of crowding can be corrected in mixed dentition cases with deciduous molars still present, while only one to two mm. can be corrected in cases with all adult posteriors in place. Figure 3a represents such a case in the mixed dentition where the deciduous molars afford about 4mm. of additional space for the crowding correction. Both second deciduous molars are disked (or sliced) 2 mm. on the mesial at the time the case is started to provide immediate space for the crowding correction. The Occlus-o-Guide® is used by the patient by actively biting and clenching for at least 5 minutes at a time for 2 to 4 hours each day and at night passively while sleeping. The preformed sockets in the appliance force the crowding to be corrected to the distal using the space created by the disked mesials of the lower second deciduous molars (Fig. 3b).

A similar case (Fig. 4a) started with the upper second deciduous molars still present, allowed space for the correction of the crowded maxillary anteriors after mesial stripping (2mm. each side) of these deciduous molars. The final result showing the improvement in the crowding and rotations is seen in Figure 4b. After the rotations are almost 75% complete, rotation cleats are placed into the appliance to finish the correction properly (Fig. 4c). These cleats are heated (red hot) and quickly placed into the appliance with a serrated plier parallel to the long axis of the teeth. The Occlus-o-Guide® appliance is then tried into the mouth to make sure the cleats are properly placed in order to exert the additional force in the right direction.

The timing of crowding corrections should be made while the deciduous molars are present due to the size difference mesio-distally when compared to the permanent premolars. In the lower arch this difference is about 3.5 mm. on each side (3.27 mm., male; 3.4 mm., female), while in the upper arch it is about 2.5 mm. (2.37 mm., male; 2.32 mm., female). When one includes the canine, the difference is slightly less (2.5 mm., lower; 1.5 mm., upper)⁴.

By using this size differential, it is therefore, possible to correct more crowding when the case is started when these deciduous molars are present. Even if only a single second deciduous molar is present as in Figure 5a, it can afford an extra 2.5 mm. (2.56 mm., lower; 2.23 mm., upper) of arch length. This was sufficient to allow the crowding to be properly corrected in a distal direction (Figure 5b). The correction of crowding usually takes anywhere from a week to only a couple of months usually for a satisfactory result. The lower corrections are particularly rapid due to the small root size of the incisors. It is critical, however, to provide space for the correction at the beginning of Occlus-o-Guide® wear due to the rapidity of the movement. Stripping, therefore, should be performed immediately as one starts this therapy (first appointment).

When the treatment is started after the loss of all deciduous teeth, one is limited in the amount of crowding that can be corrected. Figure 6a represents about the maximum amount of correction with only permanent teeth remaining by using the Occlus-o-Guide® alone. The correction is successful, (Figure 6b) but with any greater amount of crowding this case would have required some additional help to distalize the upper molars with a cervical head gear or an upper bumper. The crowding in Figure 7a for example is a case that exceeds the limits for crowding correction in the adult dentition without the use of the bumper if it had been started while the lower second deciduous molars were still in place. These two deciduous teeth enable up to 4 mm. of crowding to be easily corrected. After their loss and with the anterior closure of the leeway space, only one to two mm. of crowding should be attempted. The thickness of the mandibular body and the health of the labial alveolar bone and gingival tissue determines how much adult crowding should be attempted without proper distalization of the molars. The case in Figure 7a requires a lower bumper to properly distalize the molars and provide the necessary space at the same time the patient actively wears the Occlus-o-Guide®. The result after 4 months is seen in Figure 7b. The bumper is tied into the arch at least on one side so it cannot be removed by the patient and the Occlus-o-Guide® can be worn normally together with the bumper (Fig. 7c) to obtain the proper result.

At times, even more complicated problems such as seen in Figure 8a, where a right first molar has drifted mesially along with the second molar impacting the second premolar underneath tissue. With the use of a mandibular bumper together with the Occlus-o-Guide® appliance worn actively has enabled the crowding to be properly corrected (Fig. 8b).

In review, the Occlus-o-Guide® can correct up to 4 mm. of upper or lower crowding, provided the deciduous molars are still present. The mesial of these teeth are stripped 2 mm. per side at the time the Occlus-o-Guide® is initiated in use. Since the correction can occur so rapidly, it is important that this

space is created at the beginning of treatment. If even after a week passes without stripping while the Occlus-o-Guide® is being worn, the lower incisors might be fully corrected and displaced labially in the process with gingival recession as a result. In the adult dentition, no more than 1 or 2 mm. of crowding correction should be attempted without proper distalization of the molars with a bumper or cervical head gear, etc. Rotations of up to 45° severity can be successfully corrected with the Occlus-o-Guide®. Any rotation that exceeds a few degrees rotation, however, should be aided in its final stage of correction with the placement of cleats. Rotations that exceed 10° severity can be helped in retention with a circumferential supracrestal fiberotomy and/or the placement of retainers such as a canine-to-canine fixed lingual or a removable Hawley, etc. Rotations can be retained with the Occlus-o-Guide® but will usually require one hour of daily exercise.

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