

AUXILIARY TREATMENT: ROTATION AND IN-OUT MOVEMENT TECHNIQUES

Tips by: Robert A. Norris, DDS,
Michael B. Stewart, DDS,
Ray McLendon, DDS

Section Editor:
Rob van den Berg, DDS, MS

PURPOSE

Overcorrection, attachments, case refinement and auxiliaries can be used to complete challenging movements, in conjunction with Invisalign treatment. This sec-

tion describes tips & techniques to successfully complete the treatment to your and your patient's satisfaction.

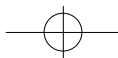
METHODS

During treatment it is critical to ensure that adequate space for movement is present to allow full expression of the Aligners. The tightness of the contact points is tested simply with floss, and IPR is used if needed. For the patient in figure 1 the rotation of #25 needs to be overcorrected.

Overcorrection of rotation and in-out position can be requested at the time the original prescription is submitted. It can also be added to the treatment at the time of ClinCheck review. If a case needs overcorrection after completion of the Invisalign series, then the case refinement process can be used to order case refinement Aligners. Severe rotations and in-out misalignment can be overcorrected over the last 2 to 3 stages of treatment.

Overcorrection of space closure has to be done last, to ensure adequate space exists for correction of rotations and in-out first. During case refinement monitor clinical progress closely, to avoid overshooting the goal. It is recommended to keep all of the finishing Aligners so the patient can step back if needed. Success with challenging rotations can be increased when buccal and lingual attachments are planned into the treatment to create a force couple (figure 2).

An alternative to case refinement Aligners is the use of "Invisa-Shims". These are small composite bumps that the doctor places on the portion of the tooth that is still turned out (figure 3). Invisa-Shims can also be used for small in-out adjustments. For severe rotations, buccal and lingual buttons can be bonded to the teeth and C-chains used to create a force couple (figure 5). Also, a lingual sectional anchorage wire with a lingual button on the rotated tooth can be used (figure 5). A small amount of wire extends from the distal end of the molar to hook an elastic chain to the button on the tooth that needs to be de-rotated. In this particular case the auxiliary was used prior to the Invisalign phase of treatment. Another technique for de-rotation is to bond an 012 or 014 NiTi wire directly to the severely rotated tooth (figure 6). The other end of the wire is lubricated with Vaseline to allow sliding and is then bonded to an adjacent tooth. To ensure sliding a 3 mm section of small gauge tubing could be bonded instead. A window is cut in the current Aligner so the patient can continue to wear it to provide the necessary anchorage. Figure 7 shows the same concept applied to the lower anteriors to complete desired root



Finishing: Rotations, In-out and Tip Movements

Invisalign Tips & Techniques

movement. Again lubrication is needed at one end of the wire and the current Aligner with a window is worn to ensure anchorage.

Buttons bonded to the teeth with a c-chain can be used to obtain better root approximation, for example in the lower incisor extraction case shown in figure 8.

The current Aligner should still be worn, to help control side-effects of the elastic force. A window is cut out of the current Aligner so it will still fit over the teeth. The use of a power arm instead of a button places the elastic force closer to the center of resistance of the root. Figure 9a and 9b shows before and after views of a lower right canine, which was up-righted successfully

with this method. Because there are no wires to guide the teeth it is critical that the treatment is monitored very closely with short visit intervals (for example weekly), to prevent or minimize unwanted side effects. In addition the current Aligner with a window cut out needs to be worn in conjunction with the fixed auxiliaries.

SUMMARY

Finishing begins at the time of diagnosis. Severe rotations and in-out misalignment can be overcorrected at the time of ClinCheck. Buccal and lingual attachments can be requested for round teeth (lower bicuspids). During treatment it is critical to have adequate mesio-distal clearance for rotations and in-out movement to be expressed fully. At the end of the treatment composite buttons, fixed auxiliaries and case refinement Aligners can be used to complete the case if needed.

Figure 1



Initial alignment

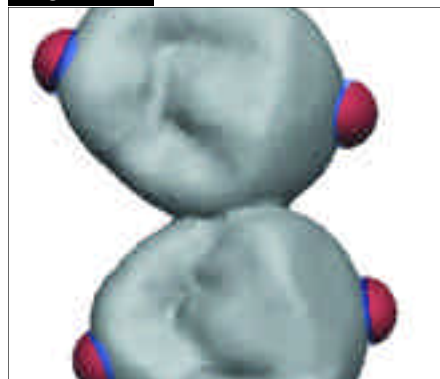


Clincheck goal



After Initial series of Aligners: rotation of #25 requires additional correction.

Figure 2



Buccal and lingual attachments on round teeth to obtain force couples.

Figure 3



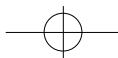
Invisi-Shim bonded to #9, marked with pencil to show placement. (Stewart)



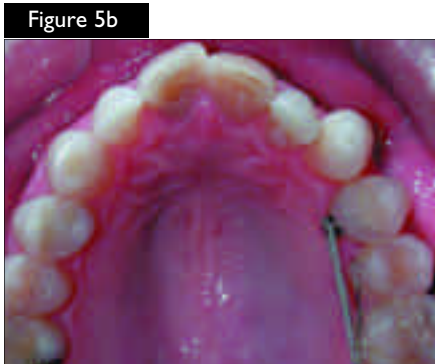
Figure 4



Buccal and lingual buttons can be bonded to the teeth and C-chains used to create a force couple for rotation.



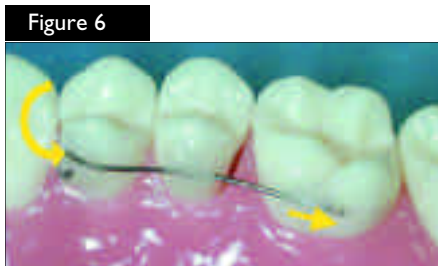
Initial. Rotated



Button bonded to UL4



Final. Upper left upper left first bicuspid. Wire auxiliary bonded to UL5 and UL6. First bicuspid de-rotated Elastic chain used from UL4 to UL6 (Stewart)



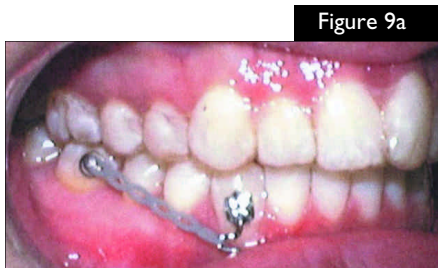
Auxiliary wire bonded to rotated tooth and to adjacent teeth. Windows are cut around the auxiliary and the Aligners are worn (Stewart)



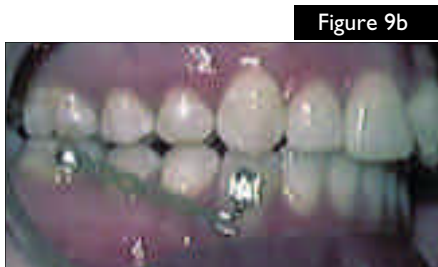
Auxiliary wire bonded to 2 lower incisors to obtain mesial root tip. Windows are cut around the auxiliary and the Aligners are worn (Stewart)



Buttons and c-chain are being used to bring the roots closer together. Current Aligner is worn. (McLendon)



Appliance placed to upright and distal rotate lower right canine. Current Aligner is worn.



Significant root uprighting and distal rotation was accomplished, in only 2 weeks time. Invisalign treatment is in progress in the upper arch. (McLendon)



881 Martin Ave., Santa Clara, CA 95050
1-888-82ALIGN
www.invisalign.com