

JUST A (CLINICAL) MINUTE! With Dr. Arnaldo (Ron) DiRezze.

We all need a little 'professional help' sometimes, and in this month's dental therapy article I would like to discuss with all of you the issue of 'why dentists get so ATTACHED'.

Attachments are an integral part of the clear aligner game and one of the areas that we the practitioner have total control over. There are many variables that can make or break a case, but diligence in your attachment selection is critical if you want to walk into your operatory confident that the teeth have moved where the computer said they would move. We have all practiced 'hope and pray' at one time or another and its my goal today to review some of the basics of attachments, show you some tips and tricks for success, and introduce what is coming for our aligner journeys in the future.

Tooth movement through plastic depends on only two variables: surface area and anchorage. Attachments make the process more efficient. They are like the catalyst in the reaction. The tooth movement would occur anyways, given enough surface area and anchorage because the force is there, but attachments can direct the traffic. With my patients I use the analogy of moving a refrigerator. I can move a fridge with my bare hands. It would take a bit, but I could rock it and push it into place eventually. However, if I had handles attached to the fridge, I could tip it, rotate it, pull it, push it, and maneuver it in tight spaces with less effort and more precision. This is the purpose of attachments.

To review, we use a series of regular attachments and a series of optimize attachments in clear aligner therapy. Regular attachments are simple squares and rectangles which are used primarily for molar movements mesial and distal as well as retention. The takeaway about simple attachments is that if they fall off, you can use the patients tray to replace the attachment. The tray engages these attachments the same way throughout every tray. Optimized attachments are different. They accomplish things like root torque, anterior tooth translation, intrusions, extrusions, and those hated lateral movements (more on this later). These attachments are the engaged by the tray in a different manner throughout the trays. Therefore, if a patient loses one of these attachments, you cannot use the tray. You must go back to the template. Many times, you will need to cut the template for it to fit the teeth since they have now moved over the course of the trays.

I would like to go through some of the attachment features of how I set my cases up. When I receive a plan back from an aligner manufacture, I have a checklist that I go through and my very first point to check is 'correct attachment in correct situation'. It is imperative to review the manufacturer websites to familiarize yourself with what the attachments are called and what they do. Many times, there is a minimum threshold that triggers a certain attachment, and you may find that the amount of movement the software prescribes is not needed in your case (canine and premolar rotations especially). As you gain confidence in manipulating your plans and seeing these cases through until the end, you will find that there is no perfect plan. Only what is best for your patient. For example,

perfect correction of a malocclusion done without any attachments in 15 trays simple cannot happen. Just like anything else in dentistry and especially orthodontics, it is a 3D puzzle whereby when you correct one variable, you have altered the other two. Having said that, here are my pro tips to help you on your way to success and minimize refinements.

Horizontal bevels

Place large, 3mm bevels on ALL premolars. This helps anchorage and most importantly still allows for expansion of premolars when space is needed. I like the security of my patient's trays snapping in at the delivery appointment. I do not want any tiny attachments where the tray can slip, rock or abrade the attachments. I want firm anchorage of those trays while the plastic and the attachments do their work in the anterior.



There are two exceptions to this rule:

1. De-rotation of premolars requires an optimized attachment.



2. Deep bite attachments are used on lower first premolars to solve deep bites by extruding premolars and helping to intrude lower anteriors.



Lingual Canine Horizontal Bevels

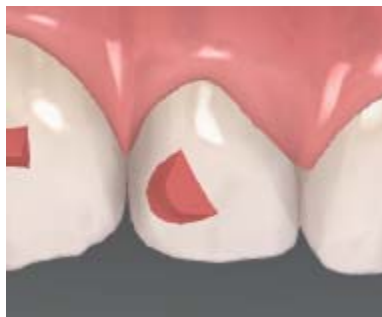
I try to manipulate every treatment plan to minimize ipr and expand as much as I can. One method of expansion is intrusion of lower anteriors. In cases where I have adequate overbite, I will prescribe lingual canine horizontal bevels and intrusion of the lower anterior teeth to save on my ipr. I always strive to get within my comfort zone of 0.2mm – 0.3mm of ipr between my lower canines.



Optimized Lateral Retention Attachment

This pro tip is an automatic in my office so much that my staff is instructed to send back the treatment plans and use this attachment when it is not prescribed. The bane of everyone's clear aligner existence is about to get better – the lateral incisor.

For years we had the 'multiplane' attachment that was supposed to have a 'corkscrew' type movement to extrude the lateral incisor and twist it into position. I will interject a question here...has anyone ever asked for overcorrection on lateral incisors? I have, A LOT!!



Multiplane attachment

Many times, the reason for failed lateral incisor rotation (aside from a decrease in surface area relative to other teeth) is failed central incisor intrusion. The multiplane attachment as shown above is not able to leverage or aid in central incisor intrusion as a method to aid in lateral rotation. As such I ask for every treatment plan to include optimized lateral retention attachments on my lateral incisors. Every time, every plan, no exceptions! This attachment looks like a big smiley in the middle of the lateral incisor. It should make you

happy because it is easy for the tray to grab, aids in most lateral movements (although it is superseded by extrusions) and does not come at the expense of surface area. For any level of clear aligner provider this attachment will remove some headaches and uncomfortable moments when patients tell you that their tooth will not turn!



Optimized Lateral Retention Attachment

The Future

Align recently released their newest algorithm, G8. This is their most substantial change in a while, and they claim they are near true molar expansion. The reason for this? They have engineered a new attachment called the G8 which directs force from the buccal and pushes downward (occlusally) to offset any tipping forces from the plastic pushing an upper molar from the lingual. The obvious big deal here is that they recognize posterior open bites as a problem and are finding a way to alleviate that problem. To fully understand this concept, it is important to review the causes of a posterior open bite (anterior interference, passive eruption, molar expansion, and molar mesial drift) and to see how G8 can fit into your treatment plan to solve this problem. The second feature of note is not an attachment at all, but a feature of the plastic called Smartforce Aligner Activation. This was explained as a method to put different pressures at different times on different areas of the tooth in the absence of an attachment. This is said by align to aid again in molar expansion and deep bite cases to intrude the lower anterior teeth.



G8 attachment and diagrammatic representation of smartforce aligner activation.

In my collaboration with Dr. Rondeau and Rondeau seminars, Brock and I have always professed education education education! It is not ok to go into any dental procedure blind and taking the advice of a manufacture's software. Clear aligner therapy is no different. Clear aligner therapy is a journey for your patients as well as for you and your office and can be personally and professionally rewarding when done right and delivered consistently. Contact Lee at Rondeau Seminars to find out more and to enroll in our upcoming clear aligner trainings. (lee@rondeauseminars.com)

In conclusion of this 'dental therapy' session I guess I would say it's ok to be attached, it's also ok to not be attached. Just make sure you have got the right attachments in your life!!