

# Clinical Techniques

## Attachment Placement Utilizing Injectable Composites

by Geri Holmes, RDA, and Christie Scott, CDA, EDDA



Geri Holmes began her passion for and dedication to dentistry 25 years ago, and received her certification in dental assisting from Tulsa Technology Center in 1991. She currently is the clinical supervisor/lead assistant for Kenneth Garner, DDS, at his three practices in Tulsa, Oklahoma.

Ms. Holmes is also a product evaluator and team trainer for Contemporary Product Solutions. She travels all over the United States and Canada educating dental auxiliaries about Invisalign. Ms. Holmes has attended numerous continuing education courses during her career, and holds an Align Certificate of Excellence (A.C.E.) as well as certifications in radiation safety, coronal polishing, and monitoring nitrous oxide anesthesia.



Christie Scott began her dental career as a dental laboratory technician and bookkeeper for Advanced Dental Studio in Bowling Green, Kentucky. Over ten years, she has expanded her skills and has held almost every staff position in the dental office, with the exception of dentist and

dental hygienist—including assisting orthodontic and surgical cases. In her spare time she volunteers at the local free dental clinic and travels as a volunteer with the “Smiles from the Heart” program.

### Introduction

Many courses of Clear Aligner Therapy are accomplished using nothing in the patient’s mouth other than the aligners themselves. For some cases, however, the desired tooth movements require attachments in combination with the aligners for proper tooth positioning.

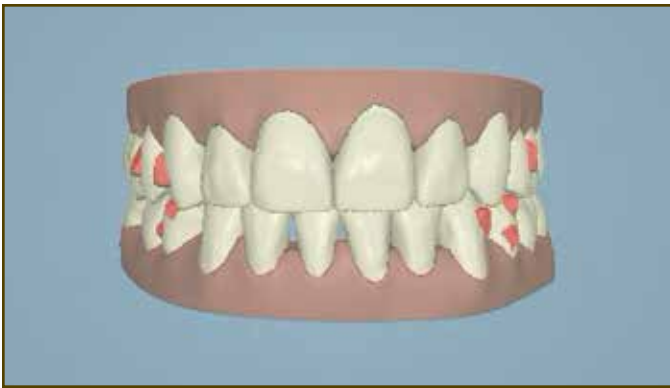
Attachments enhance the aligner trays’ ability to grip and move a patient’s teeth by providing greater surface area retention. Attachments for Invisalign aligners also serve as anchors for specific segments of teeth, so that some can move while others remain stationary. Easily removed at the end of therapy using a polishing tool, Invisalign attachments do not cause any permanent alteration to the tooth surface(s).

During initial treatment planning, and when treatment planning for Invisalign via ClinCheck, dentists can determine whether attachments are necessary and where they will need to be located (**Figure 1**). Dentists or dental assistants can then create the attachments by affixing small amounts of enamel-colored composite to the teeth, using a bonding agent and Invisalign-designed template aligners. Although this is a simple procedure that requires no anesthesia, dental attachments for Invisalign treatments do require precise placement to ensure that they properly facilitate optimal tooth movement. Complications can occur, especially when improper adhesion delays treatment and/or affects the esthetics of an overall successful orthodontic treatment.

### Material and equipment selection

Invisalign provides template aligners for creating optimal attachments, reducing the possibility for variations in attachment shapes and locations. After the practitioner submits the diagnostic records and approves the ClinCheck, Invisalign fabricates the aligners and the template aligners as well. When the patient returns for his or her first aligner appointment, it can include attachment placement and/or Interproximal Reduction.

Many clinicians, however, prefer to only insert the aligners at the first appointment, give the patient a chance to get used to wearing the aligners, and then place attachments and perform Interproximal Reduction at a second visit.



**Figure 1:** patient's ClinCheck to review for attachment placement.



**Figure 2:** trying in the attachment template and the patient's first aligner to ensure that it snaps into place and fits properly.

Attachments require a bond strong enough to anchor aligners, but weak enough to avoid altering the healthy tooth structure during removal. Although many options in bonding materials are available, G-Premio BOND™ from GC America (gcamerica.com) provides enhanced adhesion with quick working time. G-Premio BOND is a universal, eighth-generation bonding agent that is compatible with total-etch, self-etch and selective-etch techniques, providing excellent versatility.

Additionally, because maintaining high esthetics remains an important characteristic of Invisalign treatment, and because placement of the attachments frequently occurs on anterior teeth, a shaded composite (e.g., G-aenial Universal Flo from GC America) that matches the patient's enamel should be selected. This prevents the attachment from interfering with case esthetics throughout the treatment, and reduces patient anxiety regarding the appearance of the attachments. G-aenial Universal Flo composite demonstrates enhanced wear resistance, color stability with higher gloss retention than other tested flowable composites, and great sculptability to achieve the optimal attachment shape.

With many shades to choose from when using G-aenial Universal Flo, the clinician can use a standard Vita shade system, or new outside special shades that will help the clinicians create restorations with age-appropriate value, such as JE (Junior Enamel) and AE (Adult Enamel) from GC America.

Many attachments can be prescribed when it comes to Invisalign treatment. Depending on the complexity of the case, patients can have multiple attachments on one tooth.

Some clinicians are more comfortable using an injectable, flowable composite in creating attachments, while others find they obtain better results with a sculptable composite. The choice of composite is purely a matter of the clinician's preference. With that said, injectable composites are usually much easier to handle, especially when there are multiple attachments to place. When placing attachments, there is a risk of over- or underfilling the attachment window of the template; therefore, most trainers who teach attachment placement for Invisalign prefer to use an injectable composite. The injection method provides the clinician with better control for filling the attachment window areas of the template.

The dental armamentarium provides dental assistants with other tools for use in successfully placing attachments. The assistant should use a retractor that comfortably isolates teeth, and saliva ejector or high-volume evacuation to reduce excess saliva and fluid in the oral cavity that could potentially interfere with bonding. Additionally, if the practitioner chooses a heavier, sculptable composite (e.g., G-aenial Sculpt® by GC America), it is essential to use composite placement tools that allow the clinician to press the composite into the template well, ensure that the optimal amount of material is present, and stabilize the template aligner during light-curing.

On occasion, attachments may debond during Invisalign treatment for a variety of reasons, most commonly improper placement technique. A slightly wet template aligner decreases the bonding agent's ability to bond the tooth with the composite and reduces the bond strength. If an attachment debonds, locate the Invisalign Doctors Site (IDS) and request a new template for the patient based on the stage or aligner the patient is wearing at that point in the treatment. (It is extremely difficult to place a new attachment using the aligner the patient is currently wearing, because the actual aligners are stiffer than the template aligners.) In 2 to 3 days, Invisalign will ship the new template aligner, and the missing or debonded attachments can be placed again.

### Clinical technique

1. Prior to treatment, explain the attachment process so that the patient knows what to expect.
2. Insert the retractor into the patient's mouth prior to treatment, to isolate the teeth and reduce salivary contamination.
3. Try in the attachment template and ensure that it snaps into place and fits properly. Remove the template and try in the first aligner to ensure that it also fits properly (**Figure 2**).
4. Use an air-water syringe to completely air-dry the template.
5. Review the Invisalign attachment instructions regarding shape and location.



**Figure 3:** acid-etching the enamel where the attachment will be placed.



**Figure 4:** applying the bonding agent to the etched surface.



**Figure 5:** filling the attachment template window with the composite.



**Figure 6:** light-curing the bonding agent.



**Figure 7:** filling the attachment template window with the composite.

6. Acid-etch the enamel of the tooth or teeth that will receive an attachment (**Figure 3**), as per the manufacturer's instructions. Etch only the specific shape and location where the composite attachment will be placed; avoid covering any of the rest of the tooth.
7. Rinse the etched tooth/teeth for 15 seconds and dry until the tooth surfaces have a frosted appearance. If you do not see this, then repeat the step of etching the tooth.
8. Mix the bonding agent and apply it to the etched surface (**Figure 4**), then wait 10 seconds. Dry with light air for 5 seconds (**Figure 5**). Light-cure the bonding agent for 10 seconds, placing the curing light right on the tooth/teeth (**Figure 6**).
9. Load the shade-matched composite into the window of the attachment template (**Figure 7**). Make sure the attachment window is slightly overfilled.
10. Fully seat the loaded template onto the teeth. Use a spatula to apply gentle pressure around each attachment to ensure full adaptation, and squeeze excess composite away from the etched area.
11. Firmly hold down the composite and light-cure according to composite instructions.
12. Remove the attachment template, and then remove all flash and bonding resin between teeth. Floss interproximal areas and remove any excess resin or composite.

13. Repeat the procedure for any additional attachments. Seat the patient's first aligner, demonstrating how to put the aligners in and take them out.
14. Keep the template in the patient's Invisalign box. The attachment template is never to be given to the patient.

### Conclusion

Invisalign treatments may sometimes require attachments as a fundamental tool to correct tooth alignment and manage occlusion. Accurate and secure placement of attachments ensures that the optimal movement of teeth occurs and avoids wasted time in fixing failed attachments. Dental clinicians can easily place attachments by practicing the optimal placement technique and using the proper tools and materials. This helps to achieve esthetic and functional Invisalign treatment results. ■