

Using Clear Aligner Therapy to Overcome the Problem of the Deep Bite Dentition ✓

by Steven Glassman, DDS

Deep bites are often the enemy of the restorative dentist. This is an observation that dentists have shared with me during my 10 years of lecturing throughout the country.

Case in point: the patient in **Figure 1** had presented for emergency treatment for the fracture on a porcelain crown on tooth #10. The story is a familiar one for dentists that have been practicing for a while: a deep bite case that began with a chip of the lateral incisor that was first restored with resin bonding; followed, a few years later, with a porcelain veneer; then with a root canal, post and crown; and finally, with an extraction and an implant. It was never mentioned to the patient that the deep bite was contributing to shear forces and lack of “prep room” for the restorative treatment.

While the case shown is for the deep bite in the anterior, a similar scenario can be seen in the posterior, where lingually tipped molars can lead to a lack of prep room for posterior crowns. Uprighting the molars increases vertical dimension, with a resulting increase in “prep room” that provides adequate space for the restorative material.

Additional benefits accrue from using Clear Aligner Therapy before restorative treatments. One is that it allows me to control my gingival margin placement in a more minimally invasive way than doing periodontal surgery. For another, it's great when planning implant cases, because I can set up the position of the adjacent and opposing teeth in a more ideal way, and I can time my cases so that the implants are ready to restore when the aligner therapy is finished.

Adriano came to the office asking for a “smile makeover” (**Figures 2a-2h**). He was not exactly sure, but he mentioned his crooked teeth, unnatural crown on tooth #9, and lower teeth that did not show when he smiled. In the initial consultation, the examination of tooth #9 revealed a suspicious apical lesion and a +2 mobility (**Figure 3**). Adriano accepted the treatment plan we developed involving the use of orthodontics, followed by the extraction of tooth #9, placement of a bone graft, and eventual implant placement. After the orthodontic phase, 2 to 4 porcelain restorations were proposed.

We offered 2 options for orthodontic treatment: conventional or clear aligners. Adriano chose the Clear Aligner Therapy—in this case Invisalign.

After periodontal therapy was completed—scaling, root planing, prophylaxis, and oral hygiene instruction—PVS impressions (Aquasil) were taken and submitted, with 8 digital photos, to Align Technology. (It's important to note that this case was done before I incorporated the iTero scanning system into my practice. I've been using this scanning technology for the last several years.)

The treatment plan that had been developed was to open the bite anteriorly through intrusion of the 2 centrals. This would also have the effect of putting the gingival margins of teeth #7-10 in a more esthetic position. Proclination and expansion were used to provide room to relieve the crowding. The patient



Figure 1: deep bite affords insufficient room for crown preparation.

After graduating from Brandeis University in 1980 with a BA in chemistry and biology, Dr. Steven Glassman attended the Columbia University School of Dental and Oral Surgery, where he received his DDS in 1984. Dr. Glassman is a member of the American Dental Association, the New York County Dental Society, the International Congress of Oral Implantology, and the American Academy of Cosmetic Dentistry.

Dr. Glassman has published numerous articles, including “Aesthetic Tissue Response Using a Multidisciplinary Treatment Protocol for Implant Placement,” *Contemporary Esthetics*; “The SIMPL System—Use of the Atlantis Abutments,” *Inside Dentistry*; “Using a Vasodilator to Reduce Soft Tissue Anesthesia,” *Inside Dentistry*; “Considerations for Treating the Moderately Difficult Esthetic Case,” *Esthetic Dentistry* (contributor); “Digital Impressions for the Fabrication of Aesthetic Ceramic Restorations: A Case Report,” *Practical Procedures & Aesthetic Dentistry*; “My Best Case,” *Practical Procedures & Aesthetic Dentistry*; “How To: Power Whiten in Office,” *Dental Products*; and “Removable Aligner Therapy Plus Conservative Porcelain Veneers,” *Inside Dentistry*.

When he's not traveling the world educating other dental professionals in the newest technologies in cosmetic dentistry, Dr. Glassman practices with his wife, Dr. Debra Glassman, in New York City.



Figure 2a: Adriano's smile at his first office visit.



Figure 2e: mandibular view showing overcrowding.



Figure 2b: Adriano's initial presentation.



Figure 2f: left posterior view.



Figure 2c: Adriano's initial profile.



Figure 2g: note uneven gingival margins.



Figure 2d: maxillary view.



Figure 2h: Class II malocclusion end to end.

had an end-to-end Class II malocclusion on the right side and showed no sign of mobility or wear, and was unwilling to wear class 2 elastics and to undergo extended treatment time. Align Technology developed a ClinCheck treatment plan that reflected these goals and was eventually approved.

On the first visit Adriano was prepared for attachments designed by the software, and a clear template was provided to place these attachments in the ideal position on his teeth. Typically, for anterior intrusion to treat deep bites, there are multiple attachments placed on the adjacent canines and premolars to create the anchorage to aid in the push forces. After the attachments were placed and flash-cleaned, Interproximal Reduction was performed.

Adriano was given 3 sets of aligners at each visit, and returned every 6 weeks to monitor the movement. Since tooth #9 was asymptomatic, extraction was delayed until ideal arch form was developed—about halfway into the treatment. At that time, he was scheduled for an extraction and bone graft with the oral surgeon (**Figure 4**).

Since #9 in the aligner was represented in the arch, it was used as housing for a provisional material. A soft, flexible, tooth-colored resin material was used in the aligner to replace the extracted tooth (**Figure 5**). Auxiliary staff fitted subsequent aligners with the same resin material and instructed the patient on how to keep the area clean. The aligner provisional is a very comfortable and esthetic long-term provisional; however, the patient had to remove it while eating. Subsequently an acrylic “flipper” was also made to wear during social dining situations.

The implant fixture was placed 3 months later, and the implant was ready for restoration 12 weeks after placement. In this manner, orthodontic treatment and implant restoration can be coordinated to reduce total treatment time. As seen in the final photos, the anterior teeth were intruded, which decreased the overbite and evened out the gingival margins. This also allowed adequate room interocclusally for both the restorative material and the loading of the implant, so as to keep the loading forces more tensile and less shear related. When the patient was finished with the Invisalign treatment, the implant was ready to be restored.

The restorative phase included a fixture-level impression, along with opposing models, centric bite recording, and face bow measurements. The dental laboratory fabricated an Atlantis abutment (CAD/CAM-designed and -milled); a duplicate abutment (Gemini, Atlantis Components); and a diagnostic wax-up and matrix. At the next appointment, the abutment was placed and torqued to 30 nt (**Figure 6**). Teeth #7, 8, and 10 were prepared for feldspathic porcelain veneers. Final PVS impressions and bite records were sent to the lab, along with the duplicate abutment for tooth #9. The area was provisionalized with a Luxatemp restoration that was spot-bonded in place. The patient was then scheduled for an appointment to check esthetics and function. Upon approval,

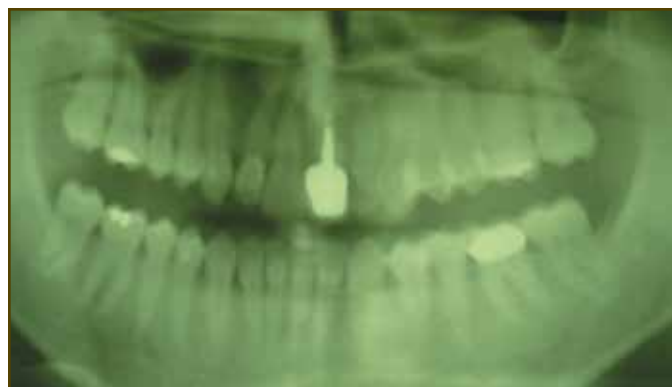


Figure 3: Panorex x-ray with fractured tooth #9 root.



Figure 4: tooth #9 extracted and bone graft placed.



Figure 5: provisional for #9 inside the aligner.

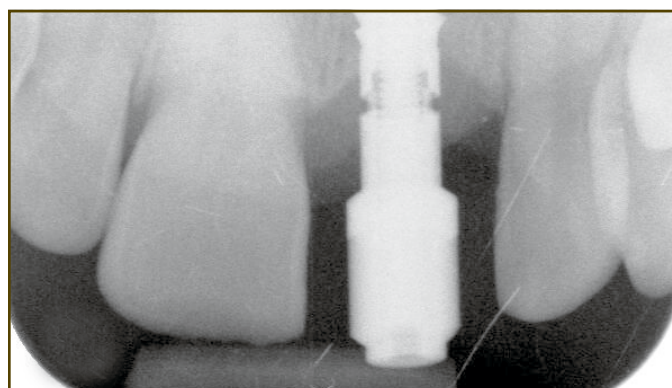


Figure 6: implant and impression coping.



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Figure 7a: Adriano at the conclusion of treatment.



Figure 7e: mandibular view with crowding relieved.



Figure 7b: post-treatment smile.



Figure 7f: left posterior view.



Figure 7c: post-treatment profile.



Figure 7g: porcelain veneers on teeth #7, 8, and 10, and implant abutment and crown for tooth #9.



Figure 7d: maxillary view.



Figure 7h: right posterior view.

the alginate impressions of the provisionals, along with the photographs, were sent to the dental laboratory.

At the subsequent appointment the case was tried in and approved by both patient and doctor, and the veneers were bonded in with Scotchbond adhesive and RelyX veneer cement (**Figures 7a-7h**). The implant crown was bonded with resin provisional cement. I typically cement in implant restorations with a provisional cement for possible retrievability in the future.

When providing comprehensive care to a patient, orthodontics is an important part of the treatment plan. I use Invisalign to help accomplish tooth movement for pre-restorative treatment. Many of these cases can be done in 6 months or less, allowing for more conservative restorative treatment. In the specific case of deep bites, treatment can be a nightmare for restorative dentists, and Clear Aligner Therapy should be considered as a treatment modality. ■



Did you know?

Decades of orthomedical research have demonstrated how poor oral hygiene can be at the crux of many major ailments such as heart disease, diabetes, dementia and arthritis, as well as complications during pregnancy, erectile dysfunction and infertility.

Users of orthodontic appliances have a much greater susceptibility to viral, bacterial and fungal infections, simply due to the nature of these devices. The resin base utilized by nearly all removable orthodontic appliances encompasses a certain degree of porosity (much greater than that of natural enamel), which promotes vast accumulation of harmful pathogens and plaque. This increase in microorganisms can provide an increased risk for many serious ailments including heart disease and diabetes.

In essence, removable orthodontic appliances cause an additional problem for the oral environment. As soon as the orthodontic appliance is removed, the surface of the removable appliance will already be dwelling with streptococci and gram negative and positive bacteria. Without proper sanitation, removable appliances may lead to the creation of new retentive areas and surfaces, which favor the local adherence and growths of various bacteria, viruses and fungi.

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Shocking Statistics

- 1 out of every 2 individuals, worldwide, has some form of periodontal disease
- A recent study by NYU College of Dentistry found that 90% of people with periodontal disease are at an increased risk of diabetes, among other life threatening conditions including stroke.
- Globally, about 35% of adults aged 60-74, have no natural teeth, necessitating false teeth or dentures.
- Roughly 50% of immune-deficient individuals develop oral fungal, bacterial, or viral infections.
- 75% of Americans will need orthodontic care at some point in their lives.

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