Orthodontic Treatment That Leads to Patient Satisfaction

Introduction
In an ever-changing marketplace, more and more adults are pursuing improved smile aesthetics through orthodontic treatment. Today, adults see their smile and dentition as an important contributor to their self-confidence. Consequently, the incidence of adults seeking orthodontic treatment in the U.S. has steadily increased from 5% in the 70s to 25% in the 90s. These orthodontic patients, however, express concern about traditional metal orthodontic appliances, and often request alternative aesthetic orthodontic appliances, mainly due to the fact that adults consider the face a main focus of attention during social interactions. Moreover, orthodontic appliances have been reported to negatively affect a patient’s self-perception when they view themselves in the mirror.

To complicate matters further, adult patients often “burn-out” quickly during orthodontic treatment and are often not prepared to proceed with treatment plans that last two to three years. Adult patients are often employed in occupations that limit their availability for routine orthodontic adjustments. As a result, they often seek out treatment options that are shorter, with fewer adjustment appointments, and no unplanned appointments, such as broken brackets and poking wires. The following case report demonstrates a combination of aesthetic Clarity SL Self-Ligating Brackets with the technology of APC Flash-Free Adhesive to provide effective and efficient orthodontic treatment in an adult patient.

Diagnosis and Treatment Plan
A 44-year-old female presented with the chief complaint of crowding and slanted tilt of the upper and lower incisor teeth (Figure 1A-J). Having worked in the dental field for over 20 years, the patient expressed concerns about orthodontic treatment that could last in excess of two to three years. Clinical examination revealed Class II division 1, subdivision right malocclusion with 50% overbite and 6 mm overjet and mild maxillary and moderate mandibular tooth-size-arch-length discrepancy (Figure 3, Table 1). The mandibular right lateral incisor tooth was fully blocked out and tipped distally. The maxillary right first premolar tooth was extracted years ago, resulting in the shift of the maxillary midline to the right by 4 mm.

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Upon completion of his orthodontic training, he was invited to join the department as an assistant clinical professor, where he founded and directed the Skeletal Anchorage Clinic, and has integrated various TAD systems into the training program.

He served as the orthodontist for the Cleveland Browns, and is currently a member of the clinical staff at the University of Alberta.

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traditional metal brackets as the treatment modality. The finalized treatment plan including the extraction of the remaining first premolar teeth in the maxillary left to allow for improvement of the maxillary midline position, and mandibular right and left to assist in resolving the tooth-size-arch-length discrepancy. The patient expressed her fears of extraction treatment leading to collapse of smile width and lip support, however, she understood the limitation of treatment options given the current malocclusion. An alternative treatment plan to create space for the previously extracted maxillary right first premolar and its future restoration using a dental implant was rejected.

Treatment Progress
Fixed appliances (.022 slot Clarity™ SL Self-Ligating* Brackets) were bonded, and leveling and aligning was initiated. The passive self-ligating appliances were chosen as they provided an aesthetic treatment option, while providing the advantage of elimination of friction which often occurs during space closure mechanics when ligated appliances are used. This property would provide an environment for more rapid space closure due to the lack of friction and hence address the patients desires of limiting treatment time to less than two years.

The brackets used were part of our initial trial series of the APC Flash-Free Adhesive, where instead of traditional filled composite cement, the brackets are lined with a non-woven mesh that is impregnated with lightly filled resin (Figure 2), and hence no flash is left behind around the bracket margins. The lack of flash leads to improved hygiene with no staining around the bracket margins as the resin is hydrophobic, and therefore, impermeable to the colored solutes in ingested foods and liquids.4,5 This was a main concern for the patient, as she is a regular coffee drinker and was concerned about the long-term aesthetics of the ceramic brackets. Clarity SL Ceramic Brackets are made of a material that has been

Profile analysis revealed well balanced facial proportions. Cephalometric evaluation revealed well balanced skeletal relationship. TMJ analysis was within normal limits. Comprehensive orthodontic treatment options were discussed and the patient expressed her desire to avoid
shown not to stain. Furthermore, the initial bonding appointment can be reduced in time as there is no time devoted to flash clean-up.

Light chain modules were used on the mandibular arch to allow for distalization of the mandibular canines on the initial .014 Super Elastic Nitinol wires (Figure 3). The case was completed using .019×.025 Heat Activated Nitinol for the maxillary and .019×.025 Beta Titanium wires, with slight reverse curve of Spee in the mandibular arch during space closure.

All spaces were closed in the first 10 months of treatment (Figure 4A-E) and a mid-treatment panorex was used to assess root parallelism in order to commence the detailing and finishing stage of the treatment. Elastics were used to settle the posterior occlusion. Fixed mandibular lingual retainers were placed, and the patient was debonded. During the debond appointment, we noted the ease with which the cement clean-up was achieved. The non-woven mesh pad remains on the tooth, and it can be easily removed using a slow-speed handpiece. Cement clean-up was quick and did not lead to patient discomfort, compared to using high-speed handpieces which can lead to discomfort due to the high pressure of cold air expressed by the turbine of the handpiece and potential post-operative sensitivity.

**Treatment Results and Discussion**

The patient was seen for a total of 13 appointments during the 19-month active treatment period. Robb *et al.*, reported a mean treatment of 30.6 ± 8.0 months in a group of adults with mainly Class I malocclusion that underwent 4 premolar extraction. The reduction in treatment time could be attributed to the efficiencies gained through the use of self-ligating appliances. The patient was pleasantly surprised by the 1.5 year treatment time, compared to the two to three years she had anticipated at the time she sought out her orthodontic consultation in our office.

No brackets were inadvertently debonded. This has been the most impressive aspect during our transition to APC Flash-Free Adhesive. Prior to using this system, our bond failure rate was 2.91% when using APC™ II Adhesive, a value significantly lower than the industry average of 5%. However, since the transition, the overall bond failure rate for both APC II and APC Flash-Free Adhesive in our office has diminished to 1.73%. This drop in unplanned appointments has not only improved the overall patient experience by nearly eliminating the number of emergency visits to the office for bracket failure, but has allowed the clinic to run without the stress of having to fit these patients into an otherwise busy day.
Post treatment records revealed a Class I molar relationship with ideal overjet and overbite (Figure 5A-J, Table 1). Cephalometric superimposition indicated slight retroclination of the maxillary incisors (Figure 6), however, the overall superimposition reveals no flattening of the profile and retraction of the upper lip. Historically, premolar extraction has been associated with such unflattering facial results, in addition to larger buccal corridors and a less aesthetic smile. However, careful treatment mechanics and the use of broad archforms wires, prevented these undesirable results in this patient (Figure 7).
Overall, the patient was extremely satisfied by the treatment results. In her own words, the patient remarked, “Eternally grateful to Dr. Razavi for giving me a smile I’ve waited 25 years for! He is a magician and he has the most skilled team in the business! Thank you, thank you, thank you!!!”

In our profession, we can often get consumed by treatment mechanics, bracket types, tips, torque, overhead costs, and can too often lose sight of the overall patient experience. As clinicians we should aim to arm ourselves with the tools that can provide our patients an aesthetic and functional smile, in a painless, effective and efficient manner. Combining Clarity SL Brackets and APC Flash-Free Adhesive allowed us to exceed this patient’s expectations.

Case photos provided by Dr. Moe Razavi.

References
5. Razavi MR. APC™ Flash-Free Adhesive: The Game Changer in Orthodontic Bonding – Part II. Orthodontic Perspectives; Vol. XX, No.2:10-12.

Footnote
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