

# I.P.R. – Inter Proximal Respect

By Benjamin Schwartz, DDS, FAGD



I.P.R. these three simple letters strike fear into the hearts of dentists and patients alike. Patients are fearful that you are going to 'shave down' their teeth, leaving them with nothing but stubs to smile with. Dentists are scared they will over-reduce the interproximal surfaces, leaving gaping spaces and poppy seed magnets. As more general dentists are utilizing some form of orthodontic therapy in their offices (see Invisalign®; Clear Correct®; Six Month Smiles®), it is imperative that this treatment modality be given the proper respect it deserves.

IPR (Inter-Proximal Reduction) must be done in a careful manner to prevent over-reducing the teeth since this can then lead to food traps, incorrect embrasure spaces and unproductive additional treatment time in order to correct these issues. Furthermore, if IPR is not done properly, then the contact points may be altered and irreversible tooth damage can occur.

Outlined in this article are two cases that highlight the opposite ends of the IPR spectrum; how they could have been prevented and what steps were necessary to rectify these issues.

## Case #1: Under-Reduction

While most clinicians focus on not over-reducing the teeth, under-reduction can lead to its own host of problems. Below is an example where not enough IPR was performed during treatment, which led to an unexpected outcome.

A 27-year-old female patient presented to my office seeking to close the large gap between her front teeth, as she did not like her appearance when she smiled (Figure 1). Clinical examination revealed that she had a stable Class I occlusion with an approximate 3mm diastema between teeth numbers 8 and 9. In addition, there was slight spacing (approximately 1mm) distal to the lateral incisors. The mandibular anterior teeth had mild crowding present.

After a thorough discussion of all treatment options, including fixed braces, removable orthodontics, and veneers, the patient opted for Invisalign therapy. In order to achieve an aesthetic result in this case, the mandibular anterior teeth would need to be positioned posteriorly to create space for the maxillary teeth to retract to close the diastema. The patient was informed of the treatment sequence and agreed to proceed with Invisalign.

The Invisalign ClinCheck called for 1.8mm of IPR throughout the lower mandibular arch in order to create space for the teeth to move appropriately. Incremental reduction was performed over the course of the treatment as opposed to creating all the necessary reduction at one time. The mindset at the time was to be careful and conservative in this regard, instead of being too aggressive and overzealous in my IPR campaign.

As treatment progressed, the diastema between the maxillary central incisors was closing as planned. All was looking good in the world of orthodontics until I spied tooth #22. Due to the under-reduction of the mandibular anterior teeth, the lower left canine tooth ended up being pushed out of the arch. Lack of appropriate IPR caused the tooth to become wedged out of place (Figures 2-4)!

When indicated, IPR is a crucial component of clear aligner therapy. It creates necessary space for the teeth to move into the desired positions. By under-reducing the interproximal surfaces of the surrounding teeth in this case, tooth #22 was physically evicted from its rightful space and was now a sad dejected loner.

In order to correct this, a refinement phase was necessary with additional IPR to be performed. This time around the IPR was carefully monitored using an IPR gauge, ensuring that the accurate amount of room was created during treatment.

This allowed for a successful treatment outcome and a very happy patient who now loves to smile (Figures 5-6).



Figure 1. Initial presentation with diastema present between teeth #8 and #9.



Figure 2. Lack of appropriate IPR caused tooth #22 to be pushed out of the arch.



Figure 3.



Figure 4.



Figure 5. Completed case with adequate IPR ensuring proper tooth movement.



Figure 6. Mandibular arch view of completed case.

## Case #2: Over-Reduction

IPR is crucial as it provides the necessary space for proper tooth movement to occur. However, as will be viewed from this case, meticulous attention must be paid to how IPR is performed. Failure to do so may lead to some very unwelcome outcomes.

A 30-year-old female patient presented to my office as a new patient. She recently completed Invisalign therapy in a different state and relocated to New York for a job opportunity. During our new patient examination, she mentioned that while the rest of her teeth were straighter, there was still one tooth on her upper left side that never became aligned properly. In addition, this tooth was very sensitive to cold and she described floss as shredding in that area.

A full set of radiographs was then taken to evaluate the condition of the patient's dentition. As can be readily seen from the bitewing, tooth #13 had IPR performed in an incorrect manner (Figure 7).

The consequences from this improper IPR therapy are: 1) irreversible tooth damage; 2) tooth hypersensitivity; 3) food impaction; 4) inability to properly clean the affected area; and 5) incomplete alignment of the teeth due to inappropriate IPR.

When IPR is being performed, attention must be paid to the tooth shape and contour to prevent unintentionally damaging any tooth structure. Particular consideration must be given when using any high speed burs or discs to perform the necessary reduction as these can create irreversible damage.

Treatment options were discussed with the patient at length. Since the tooth was still vital, a conservative resin restoration was chosen as the preferred method. The patient was aware of the possible need for future endodontic therapy. Since she was happy with her smile, no further tooth movement was to occur. Subsequently, a successful direct resin restoration was placed and the patient has been symptom-free since that time (Figure 8).

Both under- and over- reduction during IPR can lead to adverse treatment outcomes. An appropriate instrument should be used to verify proper reduction and all IPR should be performed as directed. Failure to follow the required steps may require additional treatment time. Conversely, meticulous care and attention must be paid to the manner in which the IPR is performed to prevent inappropriate reduction of healthy tooth structure. Once the tooth is damaged, supplementary treatment will be needed to rectify the situation. The take home message from both these cases is that IPR deserves our utmost respect!



Dr. Benjamin Schwartz received his dental degree from New York University College of Dentistry. He is a Fellow of the Academy of General Dentistry and maintains a private practice in New York City with an emphasis on patient-centered dental technology. He has published numerous articles on Invisalign therapy and its successful integration in a general dental office.

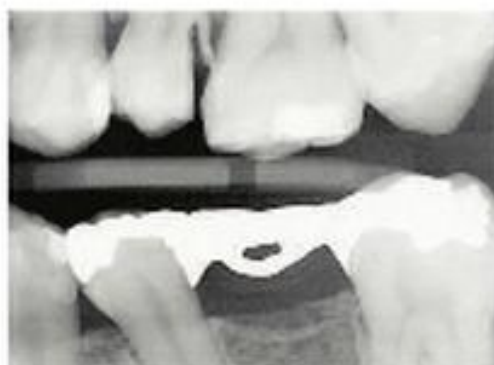


Figure 7. Improper IPR performed on tooth #13.



Figure 8. Direct resin placed on #13 to rectify the inappropriate reduction.



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