Minimum intervention and maximum results

Dr Tif Qureshi discusses a combination case and how to achieve aesthetically-pleasing alignment results whilst avoiding tooth destruction

Aims and objectives
To highlight a common case type where the patient would almost certainly have had aggressively prepared porcelain veneers placed to improve her smile as she had previously refused fixed or invisible aligner orthodontics.

Since the introduction of treatment modalities such as the Inman aligner, the traditional methods of cosmetic dentistry have been re-examined by many cosmetic dentists now taking a more conservative approach.

This article highlights a fairly common case. A few years ago, the patient would almost certainly have had aggressively prepared porcelain veneers placed to improve her smile, as she had refused fixed or invisible aligner orthodontics.

Because of the new options that the Inman aligner provides, a structured approach to dealing with the patient's wants must be undertaken. A combination of treatment such as alignment, whitening and direct bonding need to be discussed and explained.

Case discussion

This patient was a 24-year-old who complained that she was unhappy with her smile. She felt that her teeth were 'prominent and very crooked.' On examination it was clear that her upper four incisors were rotated and had chips and differential wear that created an uneven outline. Occlusal examination revealed that there was space to retract and derotate these teeth, while still maintaining anterior guidance.

Patient discussion

The patient had initially ruled out fixed braces or any type of treatment taking longer than six months. These options were offered again as it was explained that the ultimately fixed orthodontics would give better three-dimensional control, but she refused as she wanted a fast solution.

Full BACD-style digital images were taken and discussed with the patient. It was important at this stage to highlight the differential tooth wear. It is often the case that before alignment the edge shape is less noticeable as ones eye will often focus on the misalignment along line angles and contact points first. After the teeth have straightened, many adults will then notice differences in tooth length due to previous tooth wear. While rare in children, this is very common in adults and, of course, teeth that are rotated or crowded will wear at different amounts resulting in the necessity to be able to deal with this to satisfy a patient.

Cosmetic and restorative dentists are in an ideal position to be able to identify and educate the patient about this and then, of course, treat it.

Our plan was to:

- Align the upper anterior teeth with an Inman aligner and a clear finisher
- Bleach with home whitening with sealed trays
- Correct incisal edges with minimal prep composite addition
- Retain.

Treatment plan

Study models were taken and arch evaluation was completed. This is done to calculate the amount of space needed to align the teeth and to make sure that it is a suitable case for an Inman aligner.

As well as de-rotating the crowded teeth, we also needed to retract the uppers. This meant that we needed to create nearly 4mm of space using inter proximal reduction (IPR) and expansion. Many authors accept that it is perfectly safe to remove 0.5mm per contact around the incisor teeth. This equates to 2.5mm from the mesial of the canine to canine, however, an extra 1.5mm of space can be claimed, by using a midline expander combined with the aligner. More space can be claimed by performing IPR distally to the canines. In this case, a standard upper Inman aligner was made with a midline expander incorporated.

Appointments

On the fitting appointment it important to only perform a small amount of the IPR necessary. Ideally 0.13mm per

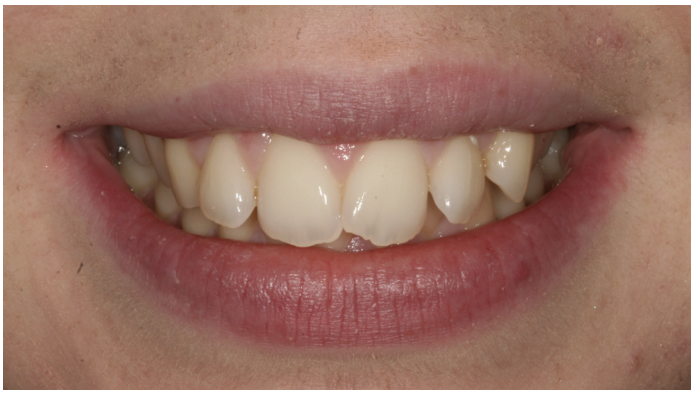

Figure 1: Before

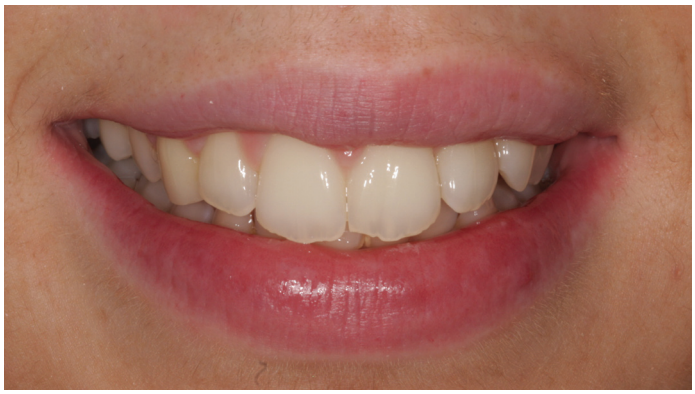

Figure 2: After alignment (12 weeks)

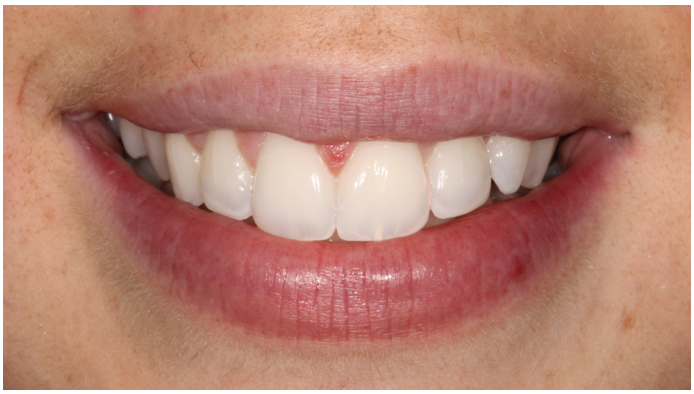

Figure 3: After bleaching and min prep bonding

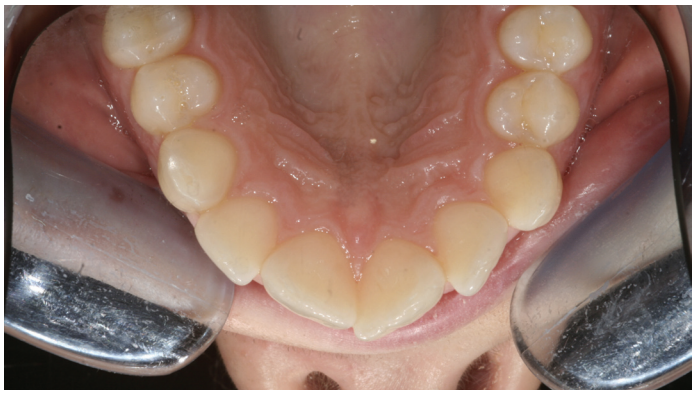

Figure 4: Before occlusal

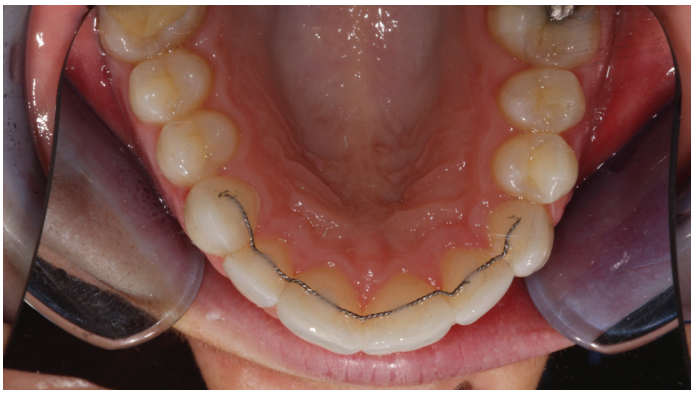

Figure 5: After occlusal

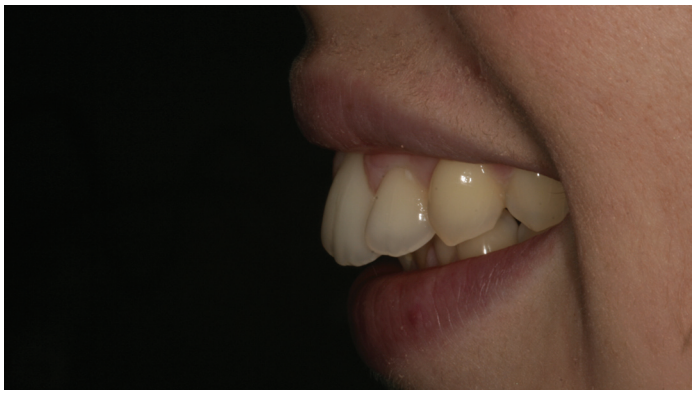

Figure 6: Side view before

contact is reproximated using Visionflex strips from the distal of the canine to canine. The contacts are smoothed and then fluoride gel is placed.

It is important not to over strip as, more often than not, less IPR is needed than expected. This way excess space creation can be avoided.

Once the IPR is completed, instructions are given for the patient to operate the midline expander once a week (0.3mm per turn). On the first review after three weeks, the contacts are re-checked and IPR repeated. The patient was instructed to only perform two more turns to achieve 1.5mm of midline expansion (beyond this occlusal equilibration might be necessary and beyond this, expansion of the opposing arch will also be required). Four weeks later, the patient was reviewed and the teeth were improving quite steadily. A further 0.13mm of IPR per contact was performed.

As her teeth were aligning, the labial bow was starting to slip down the facial surface so a composite anchor was placed just to passively engage the bow in the correct position-the incisal third. After a further three weeks, the

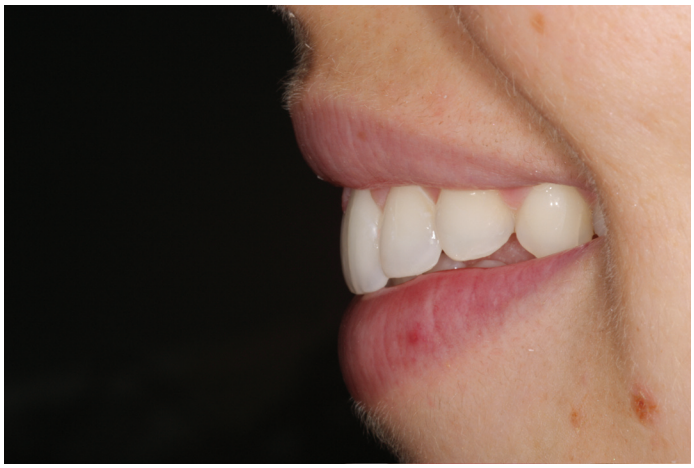

Figure 7: Side view after Inman and bonding

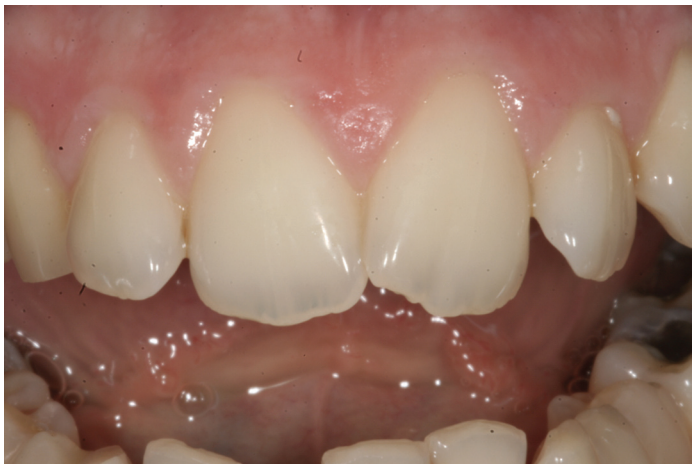

Figure 8: Close view before

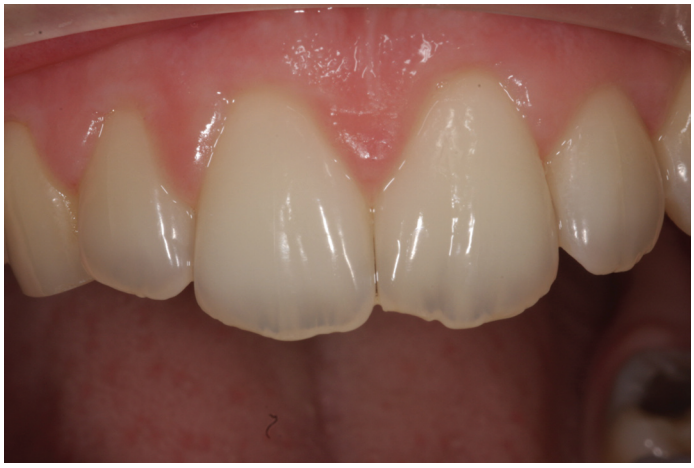

Figure 9: Close view after alignment

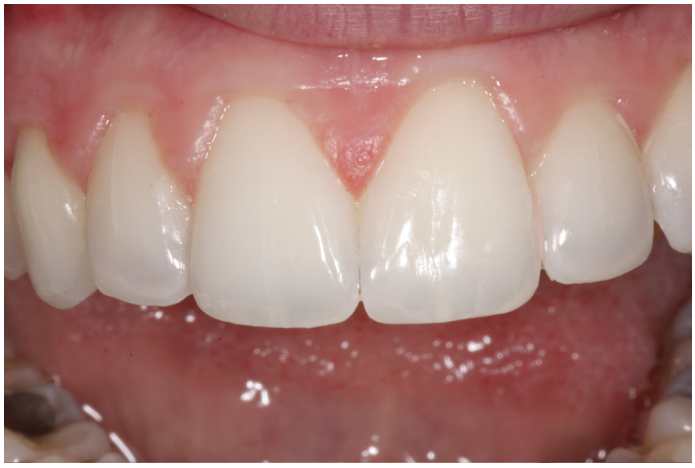

Figure 10: Close view after bleaching/min prep bonding

teeth were nearly aligned. Photos were taken to compare to the original position and to help with patient motivation. At this point a clear finisher was constructed from an impression.

The teeth are tweaked by the technician who will correct any final small rotations and a 2mm essix blank is used to make a fairly rigid clear finisher. It is clear from the photos, that while the alignment is improved, the aesthetic focus is now on the incisal edges. This clear finisher was worn by the patient for 3-4 weeks while she started to bleach her teeth over the same period using sealed trays and 6% hydrogen peroxide for 30 minutes a day. After three weeks of whitening, the patient was satisfied with the new shade. An impression was taken to construct a jig for a pre-formed wire retainer, which would be fitted at the same time as the composite edges.

After a further two weeks post-bleaching, the multi-strand stainless steel wire retainer is fitted using a preformed jig. The palatal surface is sandblasted and the wire is bonded with opti-bond solo and flowable composite before the jig is cut free. In adults permanent retention is essential. This technique has massively simplified what can be a fiddly procedure. It is important to show the patient how to clean through the contacts using threaded floss or small inter-dental brushes as conventional floss will be difficult to use. It is also important the no occlusal interferences exist with the wire.

On the same appointment, the chipped edges were very lightly bevelled. No local anaesthetic was necessary. Composite was built directly with load bearing surfaces and edges being made with hybrid material and the facial surfaces using microfill composites and then polished. The

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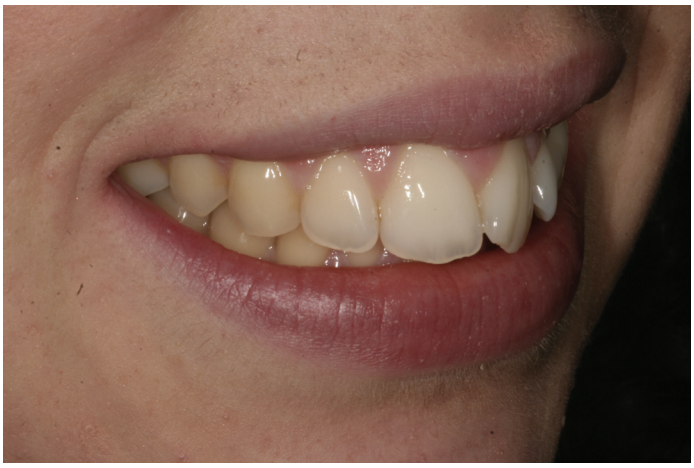

Figure 11: Before side smile view

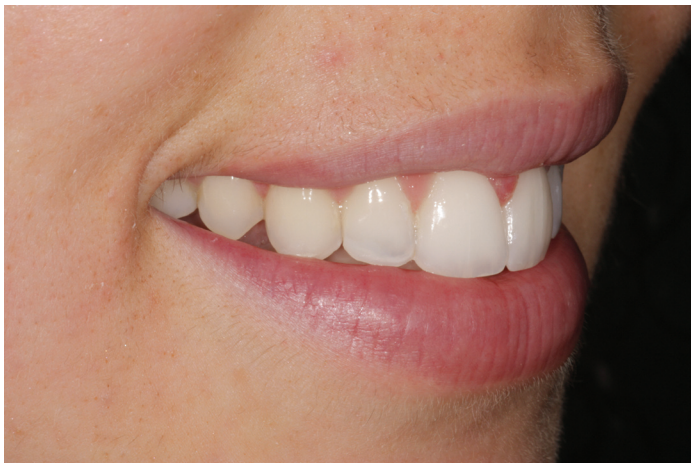

Figure 12: Side smile view after

Figure 13: Full face before

Figure 14: Full face after

patient was instructed to store her Inman aligner safely as in the event of a retainer failure and relapse, the Inman will still fit and get the teeth back into position quickly with the minimum of fuss – a great bonus.

Discussion

A very pleasing aesthetic result has been achieved without tooth destruction and the long-term maintenance required if indirect veneers had been placed.

A fairly high degree of retraction has also been achieved and this improves the profile aesthetics as can be seen in the case photos.

A highly uneven outline had been converted to something more symmetrical closer to golden proportion but still retaining a degree of natural imperfection. Clearly the composite edges will need replacement over time, but an irreversible restorative cycle has been avoided and ultimately the patient can have veneers when she actually needs them to restore her eroded enamel in the future. At least her teeth will be straight to do so. This has proved to be a very simple tool that can dramatically change the traditional approach to cosmetic dentistry.

I believe that simple removable orthodontics and pre-restorative alignment will play a big part in the future of cosmetic dentistry. PD

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Dr Tif Qureshi is a BACD board member and director of Straight-talk seminars. Dr Tif Qureshi will be at the BACD annual conference, The Future of Dentistry, in Edinburgh November 2009. For more information contact Suzy Rowlands through info@bacd.com or through the website at www.bacd.com. The Inman Aligner Certification course is available through www.straight-talks.com.