Pre-alignment - the gold standard of cosmetic dentistry

In this article **Tif Qureshi** looks at two simple methods to quickly and simply align teeth before restorative treatment is completed

Now that we have the ability to move teeth quickly and affordably for patients, our options open up, as does our need to provide more ethical and less destructive smile makeovers. The case outlined below is of a 24-year-old male who hated his smile and for a few years had considered veneers to improve it. His work meant that any orthodontic treatment had to be removable, but he also did not want years of treatment either. He also wanted to keep costs down so that he could replace his old crown and have some bonding to treat his differential tooth wear. Even though he did not like his smile, he also did not want to massively change the character of his teeth, as he was very aware that some people he knew who had veneers had a very generic smile.

Education aims and objectives

The article aims to educate the reader about the advantages and steps taken with a case using the Inman Aligner. It gives a detailed explanation of the steps taken and end result.

Expected outcomes

The reader will understand the treatment steps that are needed when performing such orthodontic treatment through this demonstrated case study.

Examination

The patient had moderate lower crowding and mild upper crowding. He had an old crown PFM crown, which was retroclined and had a dark, partially visible margin. His canines appeared pointy and his uppers were mesially rotated. The crowding of his lower teeth was also creating the incorrect angulation on the upper tooth through occlusal contacts. He was not concerned about his gummy smile.

All options were discussed and the patient

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Figure 1: Before treatment - full smile

Figure 2: After alignment with Inman Aligner lower and clear aligners upper (nine weeks)

Figure 3: After bonding on canines and lower incisal edges. Temporary crown in position

Figure 4: After final crown. Total treatment time three and a half months

Figure 5: Before treatment - close view of lower incisors

Figure 6: Three weeks after the Inman aligner

Figure 7: Seven weeks after the Inman aligner

Figure 8: After Inman aligner, bleaching and bonding

Figure 9: Before treatment - occlusal view of uppers

Figure 10: After clear aligners and crown replacement

Figure 11: Before treatment occlusal view of lowers

Figure 12: After treatment lower occlusal view (nine weeks with Inman Aligner)

decided to have an Inman Aligner on his lower arch and clear aligners on his uppers. This was because there was a larger range of movement required for the lowers. Arch evaluation using Hanchers technique (Hancher 2005) of his lower arch revealed 2.7 mm of crowding. His upper arch showed about 1mm of crowding and therefore only a small degree of movement was needed for the lowers.

Clear aligners can be a useful treatment option when treating the very mild misalignment at the same time as treating more complex misalignment with Inman Aligners. Orthodontic laboratories are very capable of constructing a low number series of aligners cheaply that can work if moving small distances. In my experience Inman Aligners are far better at treating mild to moderate crowding as only one Inman Aligner is necessary and the forces are more gentle but consistent therefore producing far quicker results.

Treatment

The Inman Aligner was fitted to the lower arch and minimal IPR (inter-proximal reduction) was started. This was carried out progressively over three visits to ensure only the minimum amount is required. The Inman Aligner treatment was completed in only nine weeks. IPR is a totally safe technique that shows not increased risk of caries (El-Mangoury et al 1991, Radlanski et al 1991) as long as the teeth are smoothed and the surfaces polished. There is also no increased risk of periodontal disease or bone loss by reducing the interdental distance (Heins 1988, Tal 1984).

Composite anchors are placed to assist in rotations. The upper arch was treated with three clear aligners to upright and balance the two central incisors. This finished at around the same time as the Inman Aligner treatment. Again, only a small degree of IPR was used to create enough space to align the teeth. The patient wore his Inman aligner for 16 hours a day and despite being less than the optimal 20 hours, his case still only took nine weeks of alignment. In the last two weeks of alignment, bleaching trays were made which the patient used. These were Day White home whitening Gel from Discus Dental for 35 minutes a day.

Once the patient was happy with the degree of whitening, one appointment was used to place composite bonding onto the incisal edges of the lower teeth and canines to improve their outlines. In adults these are often uneven due to differential wear. The upper canines were also treated with just direct bonding.

Tetric B1 Shade hybrid composite was used in supporting and load bearing areas, with BO Renamel Microfill from Cosmodent used on all facial surfaces to allow sufficient polish. Polishing was completed with soflex discs, then pogo sticks followed by flexibuff discs with enamelise.

On the same appointment the old PFM crown was removed. An impression was taken and a new temporary was placed which was contoured to a better angle of emergence.

The patient visited the technician (Tony Knight at Knight Dental Design) for shade matching. New blow down retainers were made for the patient to wear.

The new ceramic crown was made from Emax HT and bonded with variolink II and optibond FL. After fitting, impressions were taken of the lower and upper arch and sent to the orthodontic laboratory to produce preformed wire retainers on jigs. In the meantime the patient continued to wear clear retainers.

A week later the wire was bonded to the back of the upper and lower teeth, ensuring the patient could use Tepe inter-proximal brushes under the retainer. Bleaching trays were remade to fit over the new teeth to ensure the patient could perform three to six monthly top ups to keep his teeth white.

Discussion

This patient was delighted that we could produce the result he had envisaged without unnecessary tooth destruction. We had also kept the character of his teeth but simply aligned, bleached and bonded the teeth. Correcting the angulation of his upper crown meant that it was far easier to replace it with a more realistic ceramic one.

From a cost point of view, because Inman Aligners and simple bespoke clear systems are so cheap, it meant that this patient could still afford the other parts of treatment, such as bleaching and individual crown unit. The re-

Figure 13: Side smile view before treatment

Figure 14: Side smile view after Inman aligner, clear aligners, whitening, bonding and new crown

Figure 15: Retracted view before treatment

Figure 16: Retracted view after treatment

Figure 17: Close view before treatment

Figure 18: Close view after treatment

movability of both aligner systems also meant the patient would accept the treatment as they did not interfere with his work or lifestyle. Removable appliances are also arguably safer as studies show root-resorption risk reduces if orthodontic forces are removed for over four hours a day (Kameyama et al 2003).

Conclusion

In the past, many cases like this would be treated with almost full anterior ceramic solutions. With new simple orthodontic techniques, it is now easier and far more ethical to pre-align teeth to either reduce tooth preparation or eliminate it altogether. Long-term problems are far less likely causing less risk for the patient and less headaches for the dentist.

Acknowledgements

The author would like to thank Knight Dental Design for the ceramic work and Nimrodental for the Orthodontic appliances.

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