

# Complex crowding: clear aligners

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## Introduction

A female patient presented to the practice with a primary concern of dental crowding in the lower anterior region, which had led to the overlapping of teeth. This was an aesthetic issue for the patient but also compromised the oral hygiene routine due to limited access to interdental spaces and surfaces across the dentition.

A complete examination of her dental health was conducted to assess whether treatment would be suitable. Overall, the dental condition was excellent, with minimal bone loss and only a small amount of gingival recession.

The high standard of oral hygiene was especially commendable, as gingival recession can complicate routines, and compromise effective plaque debridement for some individuals.

She exhibited a class III molar relationship and a class I incisal relationship, with severe anterior crowding and displacement. Alongside this, she had an increased overbite of approximately 4mm.

The level of crowding in the mandible had led to the rotation of the incisors. The UL1 was affected to such an extent that it was almost rotated by 90°. As expected in many orthodontic cases, the maxilla was also affected, though rotations were not observed to the same extent.

The patient had undergone fixed orthodontic treatment when she was younger, which involved the removal of all first premolars. No retainer had been used, prompting relapse.



Figure 1. Pre-treatment, anterior view

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Figure 2. Crowding and subsequent rotation of the lower incisors, occlusal view



Figure 3: Crowding of the upper incisors, occlusal view



Figure 4: Pre-treatment, left lateral view



Figure 5: Pre-treatment, right lateral view

Dental health was deemed acceptable for orthodontic treatment to treat both arches, and the options available were discussed.

### Treatment options

Various approaches to treatment were presented to the patient. This included no treatment and monitoring of the dentition, which was not preferred, and the use of fixed orthodontic appliances. These would help enact targeted, effective orthodontic movements.

Invisalign was also discussed as an option, and was preferred due to having a discreet appearance and improved comfort. The removability of Invisalign also appealed, with an opportunity to complete a conventional oral hygiene routine.

Fixed appliances were considered to be too visible, and the patient was concerned that they would be painful against buccal tissue.

After orthodontic care, the opportunity for composite bonding would become available. This was not decided

upon at this point, as the patient wished to see the outcome of the orthodontic care before engaging with further treatment.

Once fully informed consent was received, treatment could begin.

### Treatment overview

The patient was provided with both upper and lower clear aligners across a 12-month period. Invisalign Comprehensive was used, as this was suitable for a more complex case.

Aligners were provided regularly at consistent check-ins, which were used to assess the progression of treatment and also monitor aspects such as oral hygiene. The patient experienced no severe issues, aside from minimal discomfort, which was expected.

Interproximal reduction (IPR) of 0.5mm was performed between the UL3 and UR3 to aid the anterior crowding and to improve the overbite. This minimally invasive approach prioritises the conservation of the dentition, only enacting removal of the enamel where it is functional, aesthetic and required to create space for alignment.



Figure 6: Alignment in the lower arch post-treatment, occlusal view



Figure 7: Alignment in the upper arch post-treatment, occlusal view



Figure 8: Post-treatment, right lateral view



Figure 9: Post-treatment, left lateral view



Figure 10: Post-treatment, anterior view



Figure 11: Final result, smile view

To aid the reduction of the posterior open bite, vertical elastics were employed in a 'box' configuration on the posterior teeth. This was the only notable challenge that had to be managed.

Buttons were placed on the buccal surfaces of the premolars and molars, covering six teeth on each side, with medium strength elastics connecting these. Elastics were only needed for a couple of months, and the patient experienced

no significant difficulties.

The complexity of this case meant that an extended treatment time was necessary, as well as a large quantity of aligners. Throughout the year, 31 aligners were provided for the maxilla, and 45 aligners for the mandible.

Success was only possible with exceptional compliance and commitment from the patient, which she displayed in abundance. The patient wore the aligners for the

recommended duration and followed all oral hygiene instructions, which maximised orthodontic tooth movement and minimised the risk of problems, such as caries development.

### **Post treatment phase**

Following the successful orthodontic treatment, composite bonding was anticipated to address black triangles in the anterior region.

Following a course of whitening treatment, the patient turned down the proposal of further restorative care, as she preferred the natural appearance of the teeth. The case was completed with professional airflow cleaning and scaling, further enhancing the aesthetic result.

In order to preserve results, retainers were provided to the patient at the end of treatment, with advice on how often to wear them.

### **Reflection**

This case was a great success, and one I am proud to have completed. The patient was happy with the outcome, which always makes the case feel truly successful.

Patient compliance and a predictable approach to care ensured results were achieved in a timely fashion.

This case also paralleled my journey through clinical photography, highlighting the impact of the IAS photography online course. The first images in this case were basic, taken without professional equipment. In contrast, the final case documentation was captured using a Canon DSLR camera with a macro lens and ring flash, significantly improving the quality and presentation of the records.

The IAS Academy training provided a valuable enhancement to case documentation and communication.

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