

Closing orthodontic gaps using clear aligner therapy

Stephanie Lingenfelder, leads us through the aesthetic correction of incisor malalignment in a case of undeveloped maxillary lateral incisors using the In-line clear aligner system



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

Many people want a beautiful smile without gaps – irrespective of their age. Hence correction of dental malalignment is an issue for adults as well. However, their therapeutic demands are high: the appliances are expected to be convenient to wear, not to cause problems with speaking and preferably not to be seen. With clear aligner therapy, even surprisingly severe cases can be treated successfully. In the case reported, the treatment was performed using In-Line clear aligners.

Initial situation

The patient came into the practice with an aesthetic request. She felt that the appearance of her smile was compromised by anterior gaps, in particular by the gap between the



Figure 7



Figure 8

teeth 13 and 11 in FDI notation (Figures 1-3).

There was a non-development of the teeth 12 and 22, disto-occlusion with an overjet of 8mm and a frontally and laterally open bite. In addition, there was crowding of the mandibular front. In her youth she had received orthodontic treatment to close the gaps in the area of the non-developed teeth.

The patient had already discussed veneers with her dentist, but due to the awkward position of the teeth it would not have been possible to obtain a satisfactorily aesthetic result using these. Therefore the dentist had been advised to close the gaps orthodontically first, in order to subsequently obtain an optimal result with veneers.

Therapy decision

The patient presented at the practice with a desire for clear aligner therapy for correction of the maxillary front alignment. During consultation, she was informed about the existing mandibular malposition and the correction options using fixed appliances – if desired also in combination with surgery for dysgnathia. However, the patient rejected extensive treatment and fixed appliances. Since physical movement of teeth can be achieved only to a limited degree using aligners, with regard to the desired therapy goal this was a borderline case for aligner therapy. In order to achieve sufficient physical movement, treatment with In-Line was recommended and discussed. From previous experience, I have found that the type of plastic used in the

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Figure 9

manufacture of In-Line aligners is able to move the teeth more effectively than systems made from hard plastic. Additionally, further modelling of the mandibular front was discussed for solving the crowding and in particular for reducing the incisor overjet.

Treatment planning

Following a full examination, accurate impressions and a bite was taken. From the impressions, In-Line was able to produce a series of preview pictures showing how the teeth would look after treatment. After reviewing these pictures with the patient and requests for modifications, the aligners for all the treatment steps leading to correction were produced. For complete closure of the front gap, teeth 13 and 23 were slightly mesialised, and to this end minor residual distal gaps by the canines were accepted. Per splint, the lab provided for a movement of the teeth of 0.3-0.6mm. For the treatment of the maxilla, seven aligners, and for the mandible, five aligners were produced and also one retention splint per arch. Maxillary aligners 1, 2, 4, and 5 were slit incisally for greater flexibility. In order to achieve more precise movement, splints 3 and 6 were closed.

Therapy

The patient wore the individual In-Line aligners, with a high level of motivation, in the daytime as well, so that – depending on the progress of the treatment – the aligners could be exchanged on average after four to five weeks. The next aligner was inserted every time the pre-programmed change of position had been affected.

By this stage the patient no longer felt any pressure on her teeth from the aligners.

Thanks to the extremely positive compliance of the patient, the therapy goal could be achieved within seven months. It is noticeable that the treatment outcome corresponded exactly to the original set-up (Figures 4-6).

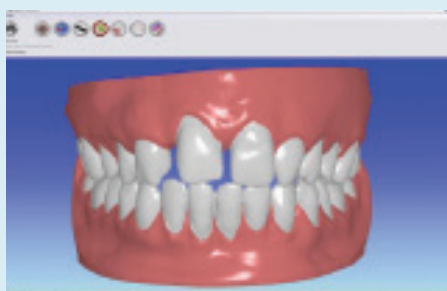
For long-term stabilisation, fixed retainers were bonded to mandibular and maxillary teeth. The patient was not able to make up her mind in favour of a subsequent veneering (Figures 7 and 8), therefore the maxillary retainer was fixed as gingivally as possible so that the patient had



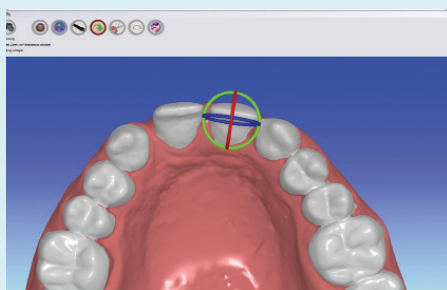
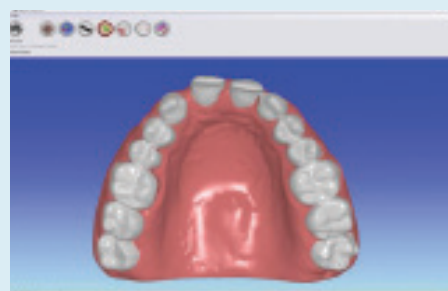
Figure 10



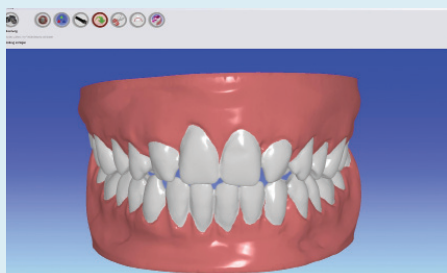
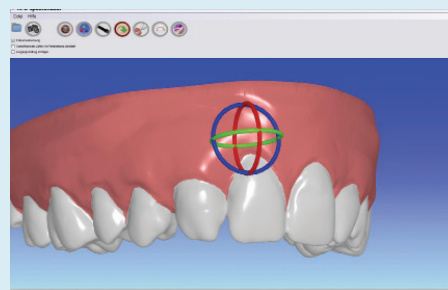
Figure 11



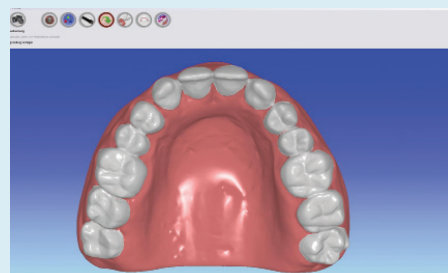
Figures 12 and 13: Treatment beginning



Figures 14 and 15: Change



Figures 16 and 17: End of treatment



the option of having composite superstructures built mesially on teeth 13 and 23 by her dentist (Figure 9).

During a later review appointment, the patient opted for levelling and bonding resulting in a further aesthetic improvement, which brought the canines into a more harmonious appearance in the dental arch (Figures 10 and 11).

Result

The relatively large gaps could be closed very well using the clear aligners, and the overjet was reduced from 8-3mm. The final outcome showed a markedly good correspondence with the set-up created at the beginning of the treatment.

Here the excellent compliance of the patient



was crucial for the swift and thorough success of the treatment. From my point of view, precise and realistic information with regard to all advantages and disadvantages of the various therapy options and exact definition of the therapy goal prior to commencement of the treatment were pivotal for the patient's complete satisfaction.