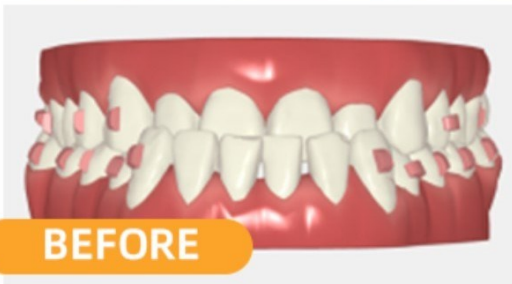




Invisible Orthodontic Appliance

VinciSmile Club Case Study (I)

Severe underbite in anterior area



BEFORE



AFTER

Basic Information

Name: Ms. Zhai

Gender: Female

Age: 27 yrs old

Chief Complaint: underbite, crowded teeth

HPI: Malalignment occurred after mixed dentition, never treated

Admission Date: 28th Feb, 2018

Clinical Examination

- **Facial and intraoral examination**

The face is asymmetrical, and the chin deviates to right. Angulus oris is asymmetrical when smiling; facial profile presents as concave type; the nasolabial angle is in the acute angle.



Permanent dentition: bimaxillary I° crowding;

Anterior teeth: underbite;

Canines and molars: Class III relationship on both sides;

Midline: the upper midline is in the middle, and the lower midline is about 1mm right aversion.

- **X-Rays Examination**



Panoramic radiograph shows the dental root distance of upper anterior teeth is in the safe state, and the root of the incisors is slightly shorter.



Cephalometric radiograph shows the diagnosis as skeletal Class III with normal SNA value, higher SNB value and negative ANB value. The anterior underbite is caused by mandibular retrusion.

IMP: Angle's CL. I, Skeletal CL.III, Anterior teeth underbite, Bimaxillary I° crowding

Treatment Goal

1. Correct anterior underbite;
2. Correct bimaxillary crowding, align teeth;
3. Keep or improve facial profile.

Treatment Plan

1. Mesialize the lower molars on both sides to correct into neutral relationship, IPR should be avoided on mandibular anterior teeth;
2. Align and level the upper and lower dentition;
3. Use Class III elastics on upper #6 tooth and lower #3 tooth;
4. Treat with VinciSmile invisible clear aligner: totally 70 sets, about 3 years.

Scheme process:

Mesialize the lower molars on both sides to correct into neutral relationship, retrude lower teeth, no IPR programmed on lower anterior teeth; align the upper teeth with slight expansion, correct teeth rotation, anterior underbite and midline.

VinciSmile 3D Scheme



Treatment Process

Phase I:

1. IPR and its timing: No IPR programmed.

2. Attachment bonding

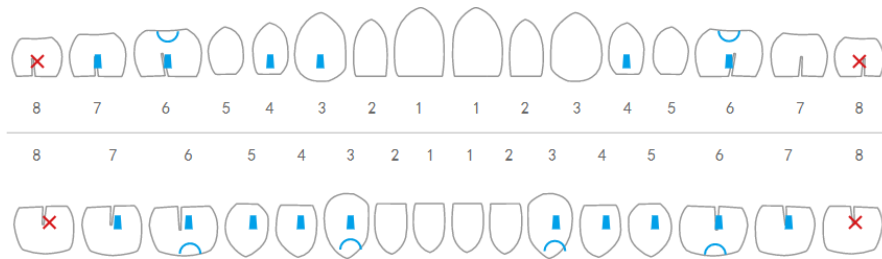
Phase I attachment programming:

Rotation attachment—assist to correct rotation of teeth 13, 14, 44 and 45;

Horizontal rectangular attachment—assist retention of teeth 24&33 and correct torque;

Vertical rectangular attachment—assist dental-root control and retention of teeth 16, 17, 26, 33, 35, 36, 37, 43, 46 and 47;

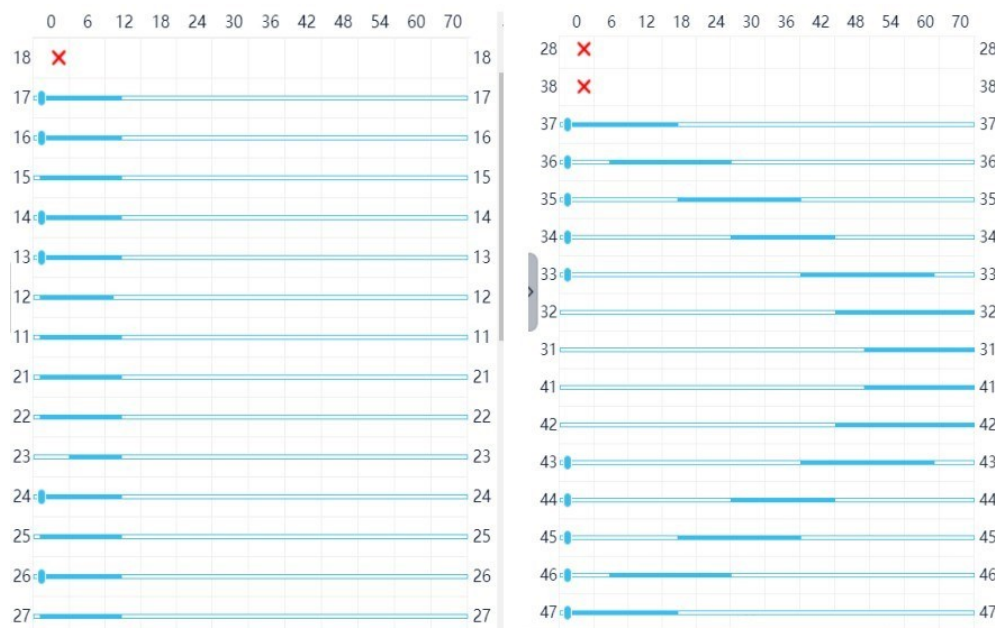
Class III elastics—assist to correct the molars in Class III relationship on both sides.



As shown in the picture, all attachments should be bonded before the first step.

3. Timing of tooth movement:

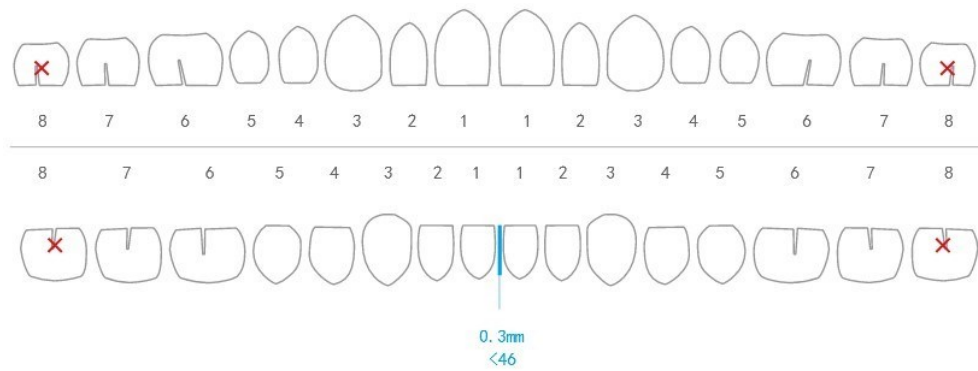
The vertical column numbers indicate the FDI, the horizontal column numbers indicate the treatment steps, and the dark blue bar indicates the specific teeth movement from one step to another step.



As shown in the picture, teeth 17-27 move from the first step and end at the 13th Step. The lower teeth are moved in V-pattern for molar distalization.

Phase II:

1. IPR and its timing:



Before stage 46, the IPR amount between 31 and 41 is 0.3mm.

2. Attachment bonding:

Phase II attachment programming:

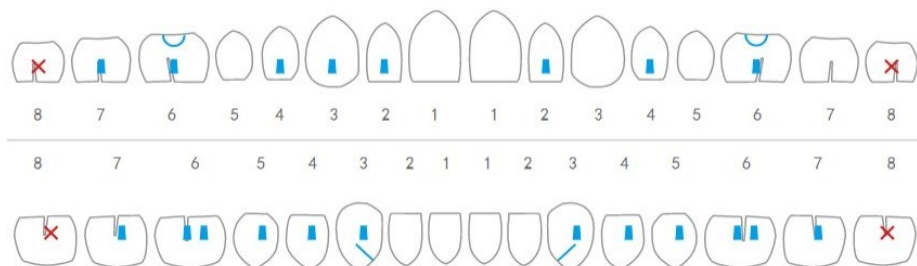
Horizontal rectangular attachment—assist retention and extrusion of teeth 34, 35, 44, and 45;

Extrusion attachment—assist to extrude teeth 12 and 22;

Vertical rectangular attachment—assist dental-root control and retention of teeth 14, 16, 17, 24, 26, 33, 36, 37, 43, 46 and 47;

Rotation attachment—assist to correct rotation of tooth 13;

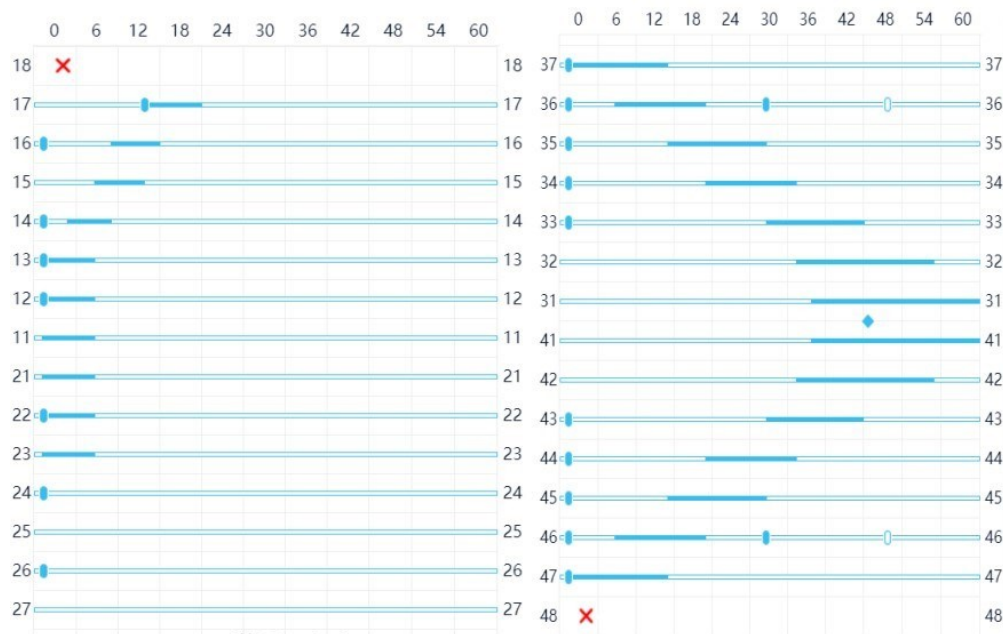
Class III elastics—assist to correct the molars in Class III relationship on both sides.



As shown in the picture, all attachments should be bonded before the first step except the ones on teeth 17, 36 and 46. Class III elastics begins at step 1. Attachments on tooth 17 should be bonded before step 14, and the ones on teeth 36 and 46 should be bonded before step 31.

3. Timing of tooth movement:

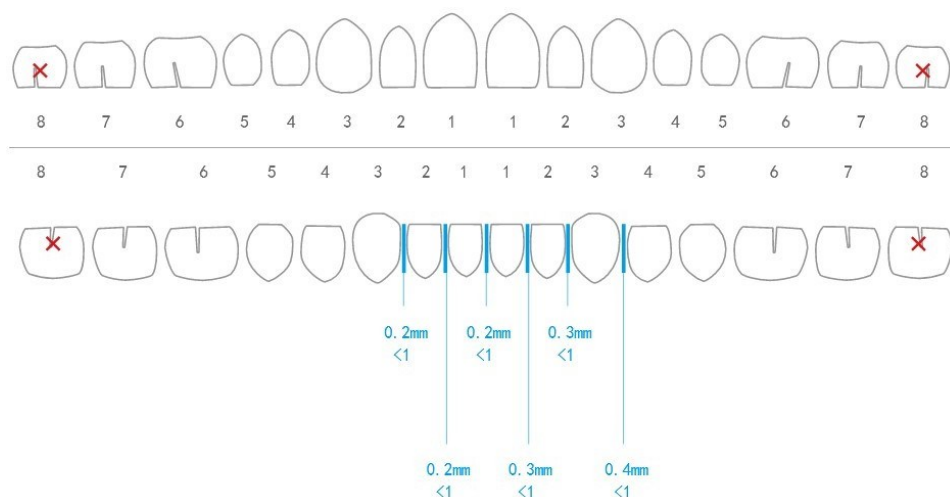
The vertical column numbers indicate the FDI, the horizontal column numbers indicate the treatment steps, and the dark blue bar indicates the specific teeth movement from one step to another step.



As shown in the picture, upper anterior teeth move from the first step, tooth 15 moves from 8th step, tooth 16 moves from 10th step, and tooth 17 moves from 12th step. The lower teeth are moved in V-pattern for molar distalization.

Phase III:

1. IPR and its timing:



Before stage 1, the IPR amount between 31 and 41 is 0.2mm, between 42 and 42 is 0.2mm, between 42 and 43 is 0.2mm, between 32 and 31 is 0.3mm, between 33 and 32 is 0.3mm, between 34 and 33 is 0.4mm.

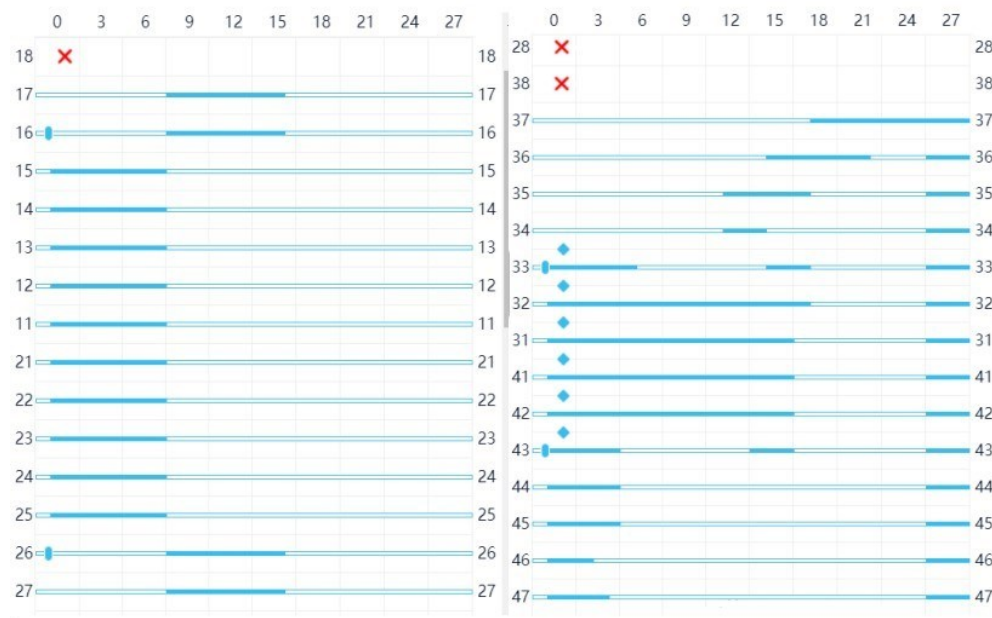
2. Attachment bonding

No attachments programmed

Class III elastics—assist to correct the molars in Class III relationship on both sides.

3. Timing of tooth movement:

The vertical column numbers indicate the FDI, the horizontal column numbers indicate the treatment steps, and the dark blue bar indicates the specific teeth movement from one step to another step.



Initial intraoral photos



7 months later

After 7 months, tooth 47 didn't distalize as expected, lower than the occlusal plane. Therefore, the tooth 47 was added with an attachment to strengthen the

movement in the reprogrammed plan.



Final stage of treatment

After the treatment, the intraoral photos show that the anterior midline is corrected, and the normal overbite and overjet have achieved.

Treatment Results

Through 30 months of invisible orthodontic treatment, the following results are achieved:

1. Corrected anterior underbite;
2. Corrected bimaxillary crowding;
3. Normal overbite and overjet;
4. Aligned upper and lower midline.

Comparison of Cephalometric radiograph before and after treatment



Comparison of Cephalometric radiograph before and after treatment



Before



After

Comparison of panoramic radiograph before and after treatment



Before



After

Case Difficulties

This case is diagnosed as Angle Class III, Skeletal Class III, and anterior underbite, and it requires large amount of lower molar distalization to solve incisor underbite.

Besides, the case also requires to align the bimaxillary midline, thus Class III elastics is necessary.

VinciSmile invisible orthodontic technique has been applied throughout the treatment, which has corrected the crowding, underbite and midline discrepancy. However, as a case of Skeletal Class III with mandible protrusion, the patient's lateral facial profile is not improved well.

Case Difficulties	Difficulty	Solution
Large amount of molar distalization	Advanced	Molar anchorage preparation and vertical rectangular attachment support
Less anchorage	Advanced	VinciSmile mechanical optimization design + V-pattern molar movement
Underbite	Advanced	Anterior expansion overcorrection

Treatment Conclusion

VinciSmile invisible orthodontic appliance is efficient and rapid in the treatment of anterior underbite cases. Carrying out the refinement 2 times, the case is treated with 80 steps in total, lasting for 30 months.

Before treatment:

Concave profile, mandible protrusion; acute nasolabial angle; underbite.

After treatment:

Concave profile, maintained relationship of nose, lips, and chin; straightened and aligned teeth, corrected underbite and midline.

Scheme Design:

Transverse: A small amount of arch expansion, it is necessary to consider that the dental root cannot go beyond the range of the basal bone.

Sagittal: Correct Class III relationship by lower molar distalization.

Vertical: Largely keep the original state.

Long axis: Add horizontal rectangular attachment.

[Start Your New Case](#)