

Zirconia Straight Wire Appliance Combined with Flat Bite Plate for the Treatment of Lingual Tipping Deep Overbite with Undersized Lateral Incisors

Yuanyu Tu, Weiping Zhao*, Xu LIU and Yuan Qin

Department of Orthodontics, Suining Central Hospital, Sichuan Province, China

*Corresponding author: Weiping Zhao, Department of Orthodontics, Suining Central Hospital, Sichuan Province, China



ARTICLE INFO

Received: 📅 November 28, 2022

Published: 📅 December 07, 2022

Citation: Yuanyu Tu, Weiping Zhao*, Xu LIU and Yuan Qin. Zirconia Straight Wire Appliance Combined with Flat Bite Plate for the Treatment of Lingual Tipping Deep Overbite with Undersized Lateral Incisors. Biomed J Sci & Tech Res 47(3)-2022. BJSTR. MS.ID.007509.

ABSTRACT

Keywords: Lingual Tipping Deep Overbite; Oversized Malocclusion; Zirconia Straight Wire Appliance; Flat Bite Plate

Case Report

Patient Jiang, Female, 25 years old, came to the clinic for irregular teeth. The case was reported as lingual tipping deep overbite with maxillary undersized lateral incisors, which the patient did not accept to restore the malocclusion morphology by denture, resulting in the selection of extraction of bilateral maxillary lateral incisors and mandibular second premolars, and orthodontic treatment by zirconia straight wire appliances combined with flat bite plate. The facial shape of the patient was well maintained after orthodontic treatment, the upper anterior teeth improved aesthetically, the upper and lower teeth realigned, the anterior teeth were covered in a normal position, and the bilateral molar relationship became neutral. During the orthodontic procedure, the extraction of lateral incisors increases the difficulty of controlling the support of the maxillary anterior teeth. The use of flat bite plate both opens the occlusion and increases the support of the upper anterior teeth, which avoids the application of micro-implant support as well as reduces invasive operations on the patient. In

cases where the aesthetics of the anterior region is affected by the abnormal morphology of the lateral incisors, it is possible to consider treatment by orthodontic treatment with the adjustment of the cusp morphology, and the replacement of the lateral incisors with cuspids.

Basic Patient Information

Patient Jiang, Female, 25 years old, First visit time: September 12, 2016, End time: January 17, 2020, The total treatment time is 39 months.

Chief Complaint

Misalignment of teeth.

Current Medical History

Misaligned teeth, request for orthodontic treatment Past and family history: no special.

Systemic Condition

No special.

Facial Examinations

General facial symmetry, Straight-faced type, with a well-

balanced ratio of upper and middle, normal height of the middle and lower 1/3 of the face, teeth uncovered by lips (Figure 1). The bilateral temporomandibular joints showed no clicking, and the opening pattern and degree of opening were normal.



Figure 1.

Oral Examinations

- Sagittal inspection: Molar and cuspid teeth Class II relationship, Upper anterior teeth lingual inclination.
- Vertical inspection: Overbite degree III.
- Horizontal inspection: upper and lower dentition crowding degree I, scattered gap in the upper dentition about 2.5 mm, bilateral labial misalignment of maxillary cuspids, and bilateral maxillary lateral incisors are undersized

malocclusions. Bilateral mandibular central incisor incisive margins were significantly attrited (Figures 2-4 and Table 1).

- Crowding of upper and lower teeth.
- bilateral upper and lateral incisors undersized malocclusion.
- lingual inclination of maxillary central incisors.
- mandibular central incisors upright compared to mandibular plane.



Figure 2: Panoramic radiograph.



Figure 3: Lateral cephalogram.



Figure 4.

Table 1.

Measuring parameters	Normal value (standard deviation)	Pre-treatment
FMIA	54.9±6.1	71.4
FMA	27.3±6.1	24.8
IMPA	92.6±7	83.8
SNA°	82.8±4	80
SNB°	80.1±3.9	77
ANB°	2.7±2	3
U1-SN°	105.7±6.3	94.4
SN-MP°	32.5±5.2	35.6
U1-NA (mm)	5.1±2.4	1.9
L1-NB (mm)	6.7±2.1	1.4

Diagnosis

Dental Type

Angle ClassII malocclusion, skeletal class I malocclusion, lingual tipping deep overbite, undersized lateral incisors.

Orthodontic Goals

To remove dental crowding, align the upper and lower range of

teeth, improve the aesthetics of the upper anterior region, correct deep overbite, restore the normal incisive function of the teeth, and improve the occlusion relationship. There are two treatment plans that are drawn up based on the patient's condition.

Plan A:

- 1, use fixed straight wire appliance orthodontic treatment.
- 2, extract the bilateral mandibular second premolar teeth.
- 3, open

the occlusion . 4, close the extraction gap, orthodontic molar relationship is completely distal-medial, cuspids are neutral, and the second molar is inserted into the orthodontic treatment. 5, maintain the normal crown width of the maxillary lateral incisors, and restore them to normal form after the orthodontic treatment.

Plan B

1,use fixed straight wire appliance orthodontic treatment. 2,extract the bilateral maxillary lateral incisors and the mandibular second premolars. 3, control the upper anterior anchorage and open the occlusal dentition with a flat bite plate. 4,close the extraction gap, adjust the molar relationship to neutral, and

incorporate the second molar into the orthodontic treatment. 5, adjust the crown morphology of the bilateral maxillary cuspids after the orthodontic treatment, and replace the lateral incisors with cuspids. After communication with the patient, the patient selected treatment plan B, extraction of bilateral maxillary lateral incisors and mandibular second premolar teeth.

Treatment Process (Figure 5)

The upper and lower dentition have been aligned and leveled, which is 0.016 × 0.022 square steel wire. A small amount of gap remains between 34, 36, and using power chain to close space.



Figure 5.

Treatment Outcome

The patient's facial shape was well maintained, the upper and lower teeth were aligned, the overbite and overjet of the anterior

teeth were normal, the labial inclination of the upper anterior teeth was improved, the relationship between the bilateral molars was neutral, and the crown morphology of the bilateral maxillary cuspids was adjusted (Figures 6-10).

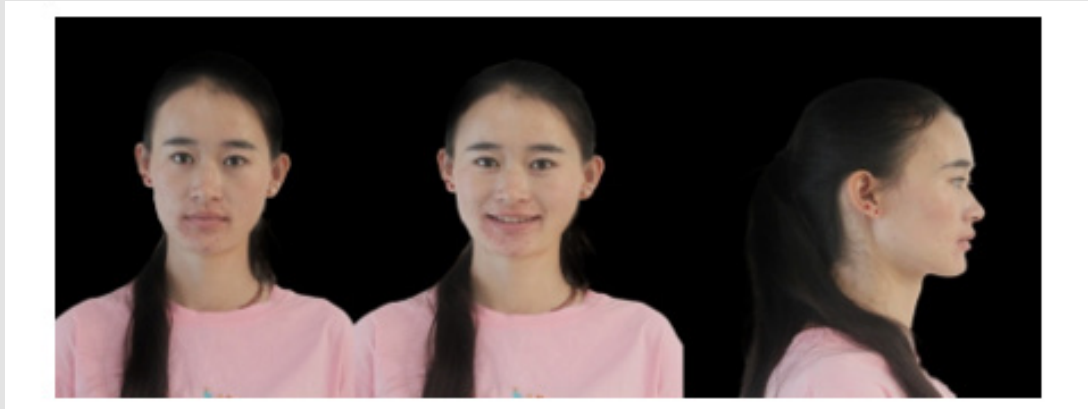


Figure 6: Facial photos after treatment.



Figure 7: Oral photos after treatment.



Figure 8: Panoramic radiograph after treatment.



Figure 9: Lateral cephalogram after treatment.

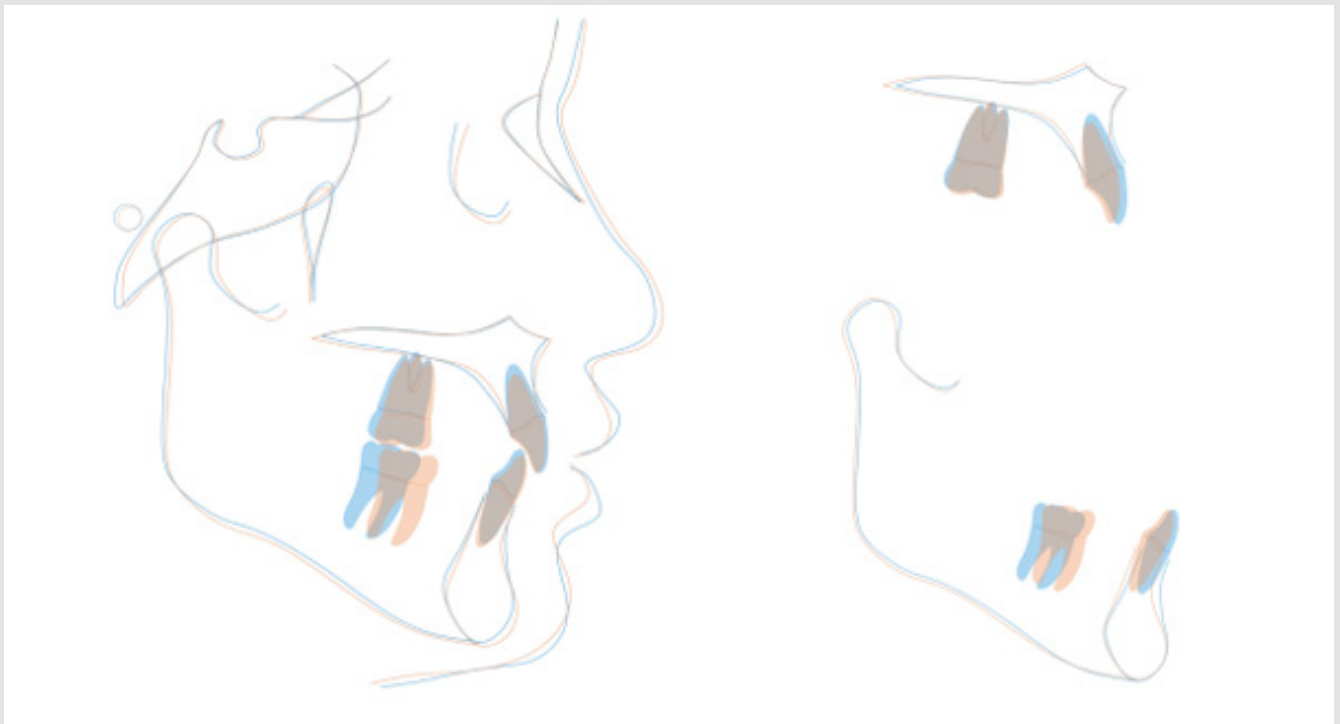


Figure 10: Overlap chart before and after treatment.

Cephalometric Analysis (Table 2)

Treatment Mechanisms and Experiences

1. This case is a lingual tipping deep overbite with little crowding, so the extraction needs to be done with caution. Since

the patient did not accept the restoration of the malocclusion lateral incisor morphology through the denture, the option of extracting the maxillary malocclusion lateral incisors added to the difficulty of controlling the maxillary anterior anchorage in the orthodontic treatment.

Table 2.

Measuring parameters	Normal value (standard deviation)	Post-treatment
FMIA	54.9±6.1	68.1
FMA	27.3±6.1	23.6
IMPA	92.6±7	88.3
SNA°	82.8±4	80.2
SNB°	80.1±3.9	77
ANB°	2.7±2	3.2
U1-SN°	105.7±6.3	92.9
SN-MP°	32.5±5.2	35.1
U1-NA (mm)	5.1±2.4	2.7
L1-NB (mm)	6.7±2.1	2.4

2. The flat bite plate was used in the maxillary anterior region during the orthodontic procedure. In this case, the flat bite plate served two purposes, one was to open the occlusal dentition, and the other was to increase the anchorage of the maxillary anterior teeth, the direction of tooth movement in the upper dentition was anterior to the posterior teeth, and the wearing of the flat bite plate blocked the lingual movement of the upper anterior teeth. It also avoided the use of

3. Micro-implant anchorage and reduces invasive operations on the patient.

4. In order to adjust the mandibular molar relationship as neutral, the bilateral mandibular second premolars were extracted and the mandibular extraction gap was closed with continuous ligatures between the bilateral mandibular first premolar as a whole to strengthen the anchorage control of the lower anterior teeth, while the second molar was incorporated

early in the orthodontic treatment to prevent the first molar from tilting forward when the gap was closed.

5. The key to successful orthodontic treatment is well controlled anchorage.

6. The effect of the planar guide to open the occlusion is positive, and in adult patients it improves the deep overbite mainly by depressing the mandibular anterior teeth.

7. Through orthodontic treatment, in conjunction with adjusting the cusp morphology, replacing the lateral incisors with cuspids is a way to solve the aesthetic impact on the anterior region due to the abnormal morphology of the lateral incisors.

8. Zirconia brackets have the advantages of aesthetics, hardness, small size and low friction to meet the clinical needs and clinical utility.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2022.47.007509

Weiping Zhao. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>