10.5005/jp-journals-10029-1028

CASE REPORT

ISW for the Treatment of Facial Asymmetry Crossbite Case with Upper Right Lateral Incisor Missing

Chia-bin SUN, Jian-hong YU

ABSTRACT

Class III malocclusion with facial asymmetry is difficult to treat with orthodontic treatment without surgery. Skeletal class III malocclusion can be treated with surgery or orthodontic treatment by camouflage. Functional class III malocclusion can be treated perfectly by orthodontic treatment, using the intermaxillary elastics (IME) to correct the jaw relation. Differentially, diagnosing a class III case is important before deciding the treatment plan. We must understand the type of class III malocclusion and then we can make the best choice for the patient. This article reports the treatment of adult class III malocclusion by the improved superelastic TiNi alloy wire (ISW). Using the ISW crossbite arch, coil springs and IME, adequate overbite and overjet were achieved and better facial symmetry was also improved.

Keywords: Dental class III, Functional class III, Skeletal class III, Facial asymmetry.

How to cite this article: SUN Cb, YU Jh. ISW for the Treatment of Facial Asymmetry Crossbite Case with Upper Right Lateral Incisor Missing. Int J Experiment Dent Sci 2012;1(2): 113-117.

Source of support: This work was supported by China Medical University and Medical Center, Taichung City, Taiwan (Grant number: CMU97-080 (2008) to JH YU).

Conflict of interest: None

INTRODUCTION

Improved superelastic TiNi alloy wire[1] (ISW; developed by Tokyo Medical and Dental University, Japan) with low-stress hysteresis (LH) will be discussed in the treatment of adult facial asymmetry with anterior crossbite and upper right lateral incisor missing case. The properties and characteristics of ISW are particular on their superelasticity, shape memory, and shock and vibration absorbing property.[2] Differentially diagnosing a class III case by dental[3,4]/functional[5,6]/skeletal[7-9] is very important before the active treatment. This case shows functional interference around the anterior portion which was corrected by ISW crossbite arch. After 2 years and 6 months of treatment, a desirable outcome was achieved and the patient was pleased with the treatment result.

CASE REPORT

An adult male (24 years old) came to our clinic with a chief complaint of bad bite, crooked teeth and an asymmetrical face countenance (Figs 1 and 2). Clinical examination found class III molar relationship with functional anterior crossbite (#13, #11, #21, #22, #23), overjet of –4.0 mm, a deep overbite of 6.0 mm, upper right lateral incisor missing, mild crowding and mandibular left shift, resulting in facial asymmetry (Figs 1 and 2). The #26 crossbite and severe rotation of #23 was noted. Upper right arch discrepancy was –8.5 mm and upper left was –4.5 mm. Lower right arch discrepancy was –1.5 mm and lower left was –2.5 mm. From the pretreatment panoramic and cephalometric radiograph

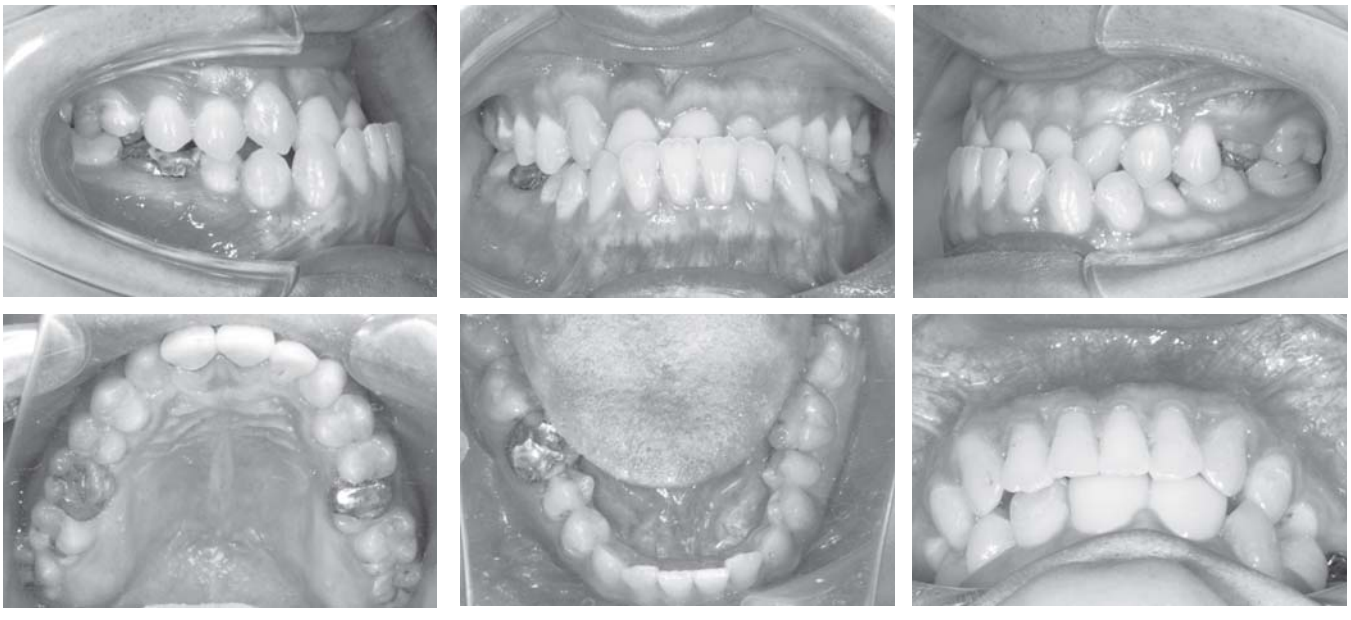

Fig. 1: Pretreatment intraoral photographs

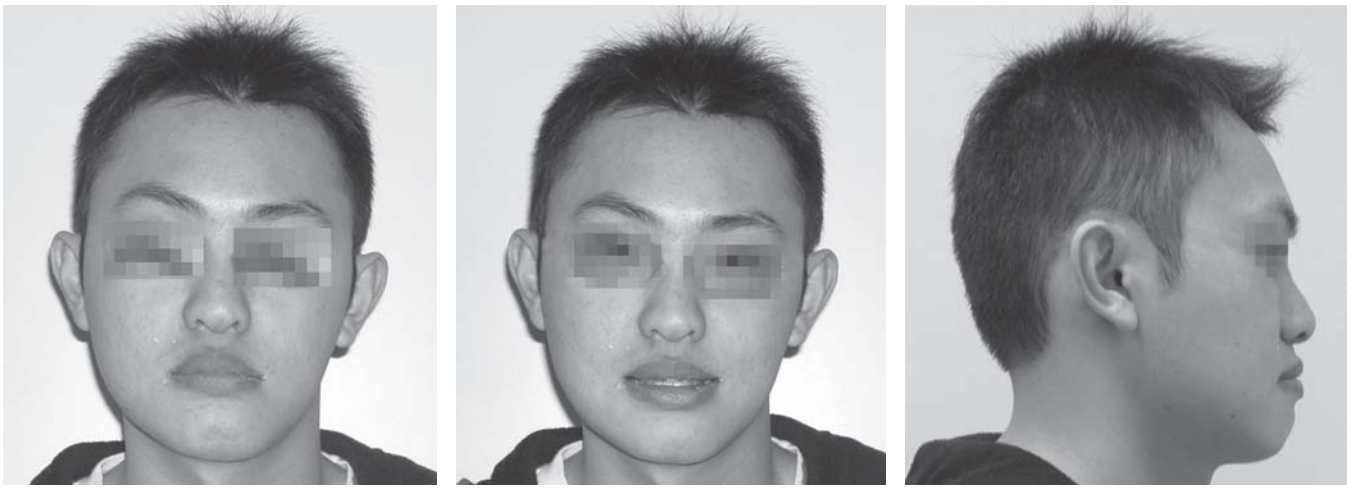

Fig. 2: Pretreatment facial photographs

Fig. 3: Pretreatment panoramic and cephalometric radiograph

(Fig. 3), #26, #46 large restoration with failure endodontic treatment, #12 missing and #38 impaction was revealed.

At first, we extracted the teeth of #18 and #38. In order to relieve crowding and to correct the midline, we extracted the failure endodontic teeth of #26 and #46. Full mouth DBS was proceeded. ISW (developed by Tokyo Medical and Dental University) crossbite arch and class III elastics was performed to correct the anterior crossbite (Fig. 4A). After 2 months of treatment, anterior teeth reached an edge-to-edge relationship. A 100 gf open coil spring and short class II intermaxillary elastics (IME) were used for #12 space creation for a period of 3 month (Fig. 4B).With the treatment of severe rotation and crossbite of #23, ISW was placed under the incisal wings of bracket (not in slot) to intrude #23, then #23 was rebonded to derotate by full engagement of ISW. Further improvement of #23 Bu-Li alignment by ISW expansion arch (Fig. 4C). With the use of differential closed coil springs and IME, midline correction was obtained. Finally, we used IME for better interdigitation.

By using the ISW crossbite arch and class III elastics, we can correct the anterior crossbite easily. Besides the use of ISW crossbite arch, the elastic chain for space closure, open coil spring for derotation and IME for better interdigitation was used. After 30 months of therapy, a desirable occlusion of adequate overjet and overbite was

Fig. 4A: Treatment procedure: Crossbite arch was used. Stoppers placed mesial to #13 and #23 and class III elastics were used to correct anterior crossbite

Fig. 4B: Treatment procedure: The 100 gf open coil spring and short class II IME were used for #12 space creation

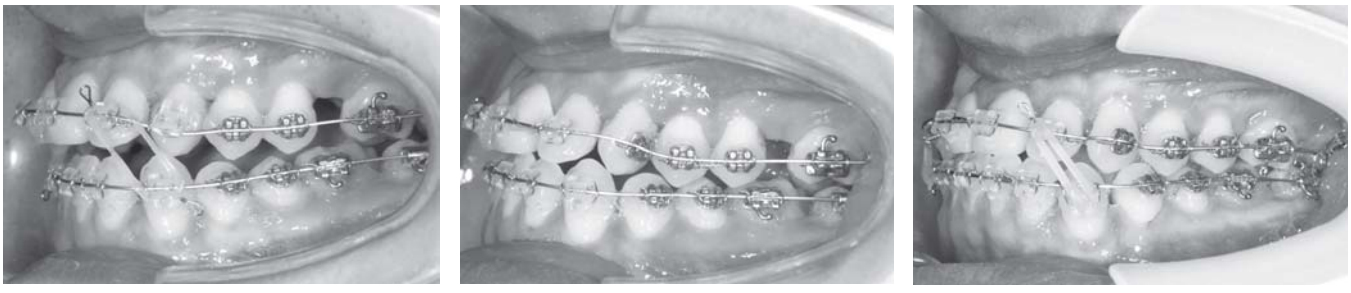

Fig. 4C: Treatment procedure

achieved under a clean and efficient treatment (Fig. 5). Space of #12 was regained for subsequent prosthesis. In the finished occlusion, a pleasant smile and a satisfactory anterior dentition were acquired on esthetic concern. Better facial symmetry was obtained (Fig. 6). Radiographically, teeth were displayed on the proper position without root resorption (Fig. 7).

DISCUSSION

In this case, we used (i) ISW crossbite arch and IME to correct the anterior crossbite, (ii) sagittal expansion arch to correct #23 crossbite and (iii) differential IME to correct dental midline shift and facial asymmetry. These are discussed individually as follows:

1. *ISW crossbite arch and IME:* ISW crossbite arch with crimpable stoppers can be reinforced for the strengths and flare out anterior teeth to correct anterior crossbite. The purpose of class III IME provided a lower backward pulling force for anterior crossbite correction (Fig. 8).
2. *Sagittal expansion arch:* In the past, it is very difficult to 'labially' expand one specific section of the dental arch. But with ISW expansion arch with wire bending by the heat bender, we can specifically expand the section where we want to (Fig. 9).

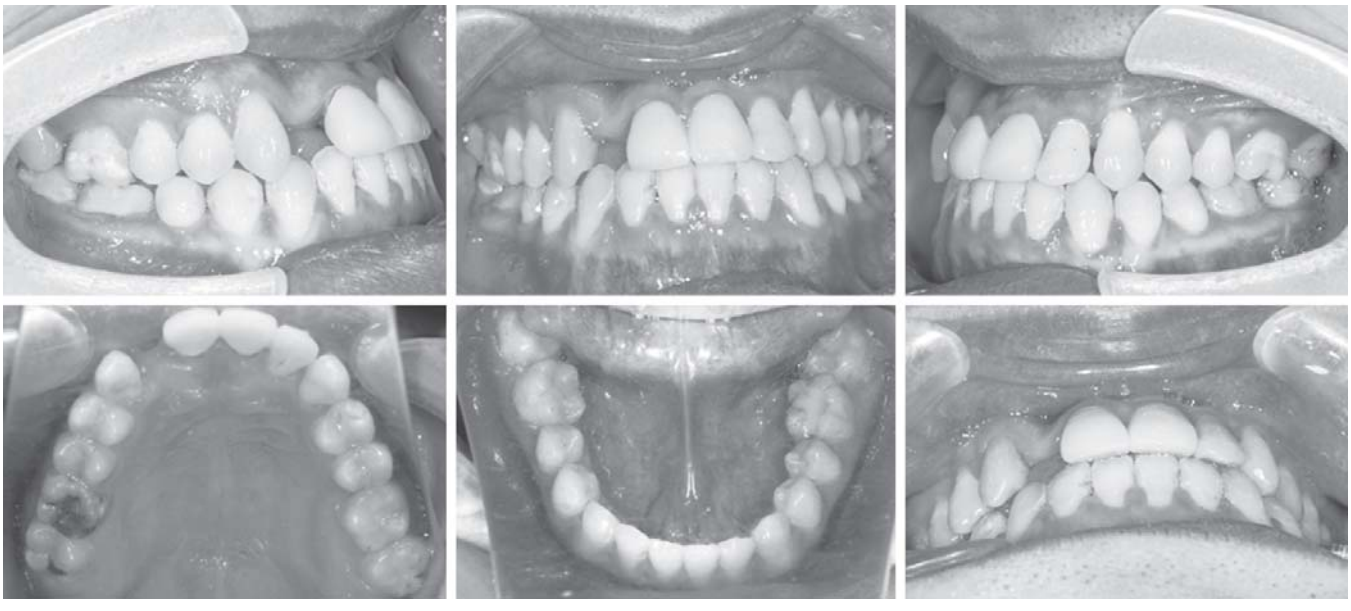

Fig. 5: Post-treatment intraoral photographs

Fig. 6: Post-treatment facial photographs

Fig. 7: Post-treatment panoramic radiograph

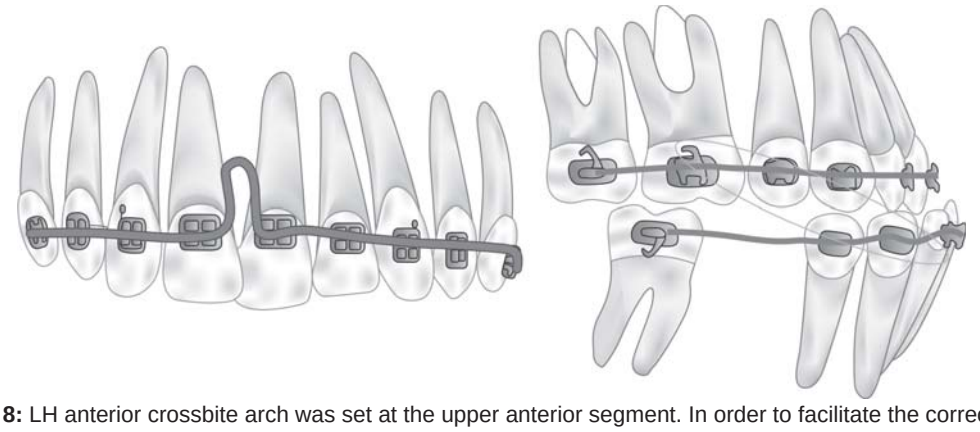

Fig. 8: LH anterior crossbite arch was set at the upper anterior segment. In order to facilitate the correction, class III intermaxillary elastics were also used

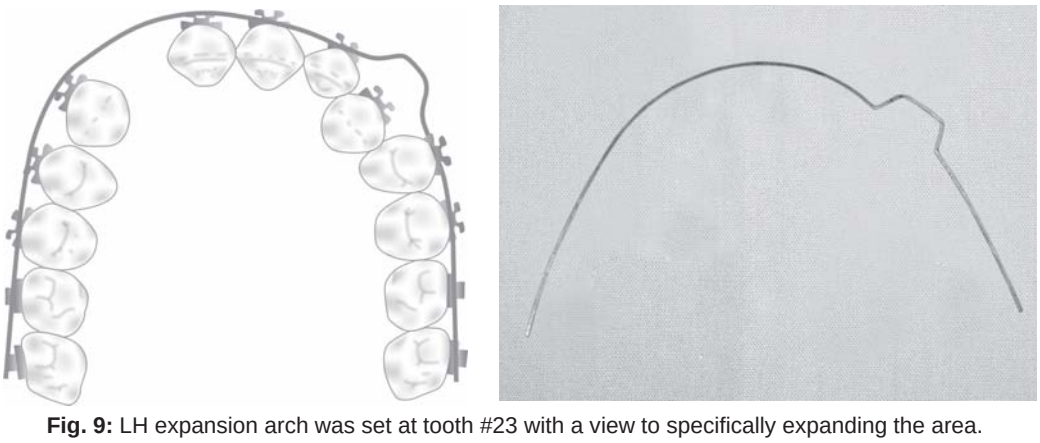

Fig. 9: LH expansion arch was set at tooth #23 with a view to specifically expanding the area. On the right, it is the photo of LH expansion arch

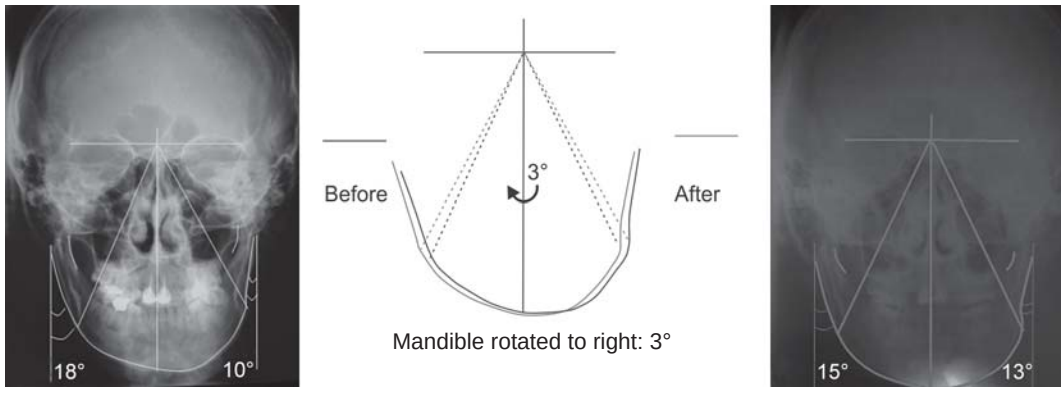

Fig. 10: A comparison of mandibular shift before and after treatments was shown. A correction of about 3° was noticed

3. *Differential IME:* In the process of orthodontic treatment, we use differential IME to correct facial asymmetry. Although this patient refused to receive orthognathic surgery, a desirable outcome was achieved and facial asymmetry was much improved by orthodontic treatment (Fig. 10).

REFERENCES

1. Iramaneerat K, Hisano M, Soma K. Dynamic analysis for clarifying occlusal force transmission during orthodontic archwire application: Difference between ISW and stainless steel wire. J Med Dent Sci 2004;51:59-65.
2. Miura F, Mogi M, Ohura Y, Hamanaka H. The superelastic property of the Japanese NiTi alloy wire for use in orthodontics. Am J Orthod Dentofacial Orthop 1986;90(1):1-10.
3. Mok CW, Wong RW. Self correction of anterior crossbite: A case report. Cases J 2009 July 14;2:6967.
4. Bayrak S, Tunc ES. Treatment of anterior dental crossbite using bonded resin-composite slopes: Case reports. Eur J Dent 2008;2(4):303-06.
5. Rabie AB, Gu Y. Diagnostic criteria for pseudo-class III malocclusion. Am J Orthod Dentofacial Orthop 2000;117:1-9.
6. Yoo EH, Kim TS. Morphological differences between functional and skeletal anterior cross-bite patients. Korean J Orthod 2001 Aug;31(4):439-45.
7. Akahane Y, Deguchi T, Hunt NP. Morphology of the temporomandibular joint in skeletal class III symmetrical and asymmetrical cases: A study by cephalometric laminography. J Orthod 2001 Jun;28(2):119-28.
8. Yang Z, Ding Y, Feng X. Developing skeletal class III malocclusion treated nonsurgically with a combination of a protraction facemask and a multiloop edgewise archwire. Am J Orthod Dentofacial Orthop 2011 Aug;140(2):245-55.
9. Leon–Salazar V, Janson G, Roberto de Freitas M, et al. Nonextraction treatment of a skeletal class III malocclusion. Am J Orthod Dentofacial Orthop 2009 Nov;136(5):736-45.

ABOUT THE AUTHORS

Chia-bin SUN

Resident, Department of Orthodontics and Dentistry, China Medical University Hospital, Taichung, Taiwan

Jian-hong YU (Corresponding Author)

Associate Professor and Director, Department of Orthodontics and Dentistry, School of Dentistry, College of Medicine, China Medical University Hospital, Taichung-40402, Taiwan, e-mail: kenkoyu@mail.cmu.edu.tw