Case Report

Case Report: Treatment for Class II Division 1 with Unilateral Scissors Bite

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A young male (14 years old) came to our clinic with a chief complaint of maxillary protrusion and not being able to chew food well with his right posterior teeth. Clinical examination revealed Class II division 1 malocclusion with unilateral scissors bite on the right side. With successful molar upright on the right lower arch by bracket upside-down, adding crown buccal torque on the archwire and ISW(Improved Super-elastic Ti-Ni alloy wire, developed by Tokyo Medical and Dental University) Expansion Arch technique, scissors bite was corrected quickly. Treatment was completed within 15 months and a desirable occlusion after the active treatment was achieved. ***(J. Taiwan Assoc. Orthod. 22(3): 21-27, 2010)***

Key words: 缺英文關鍵字

INTRODUCTION

Treatment of posterior scissors bite (Brodie bite) case is always a challenging scope of orthodontics in its difficulty and time consuming. This kind of malocclusion had developed partially because of lingual tipping of the lower segments, and partially because of a lower jaw too small, relative to the maxilla. Conventionally, it is necessary to use occlusal splint for bite opening and cross elastics[1,2] in order to correct scissors bite. Some authors also use headgear[3] or transpalatal arch[4] to correct molar position and distraction appliance[5] to correct the jaw width. However, if patients can not cooperate with the orthodontist, an ideal occlusion can not be achieved smoothly in a short period. With the development of ISW[7-11] (Improved Super-elastic Ti-Ni alloy wire, developed by Tokyo Medical and Dental University), treatment of scissors bite has become very effective. The aim of this article was to present a scissors bite case treated by ISW Expansion Arch Technique (Fig.5,6,12,13) combined with bracket upside-down (Fig.14) without using any occlusal splint or cross elastics.

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CASE REPORT

A young male (14 years old) came to our clinic with a chief complaint of maxillary protrusion (Fig.1) and not being able to chew food well with his right posterior teeth. Clinical examination revealed Class II division 1 malocclusion with unilateral posterior scissors bite on the right side (Fig.2-4). Due to esthetic concern, extraction of #14 and #24 was adopted to relieve his large overjet. With successful molar upright on the right lower arch by bracket upside-down, adding crown buccal torque on the wire and ISW Expansion Arch technique, scissors bite was corrected efficiently. The total treatment was completed within 15 months and the patient was satisfied with the outcome.

DIAGNOSIS AND TREATMENT PLAN

A. Diagnosis

The patient had a canine Class II and molar Class II dental malocclusion and skeletal Class II pattern, with 5.0mm of overbite, 8.0mm of overjet , upper anterior teeth labially tipped, scissors bite was noted around the lower right posterior teeth. The arch length discrepancies were -0.5 mm in the maxillary arch and -2.0mm in the mandibular arch.

B. Treatment plan

1. #14, #24 extraction
2. Scissors bite correction

TREATMENT PROCEDURE

2005-10-19 Full mouth DBS, leveling with 0.016x0.022 ISW wire
Upper arch canine distal drive was performed.

2005-11-16 Upper arch: canine distal drive
Lower arch: expansion arch with crown buccal torque

2005-12-14 #47 bracket was placed upside down for scissors bite correction

2006-01-11 Upper arch: anterior retraction
Lower arch: straight wire expansion with crown buccal torque(Fig.5)

2006-02-08 #16, #17 crown palatal torque >90°
#46, #47 crown buccal torque >90°

2006-04-12 #44, #45 sectional expansion arch, #15 not-in-slot for intrusion (Fig.6)

2006-06-21 #45 scissors bite corrected

2006-08-16 #46, #47 scissors bite corrected

2006-12-13 Intermaxillary elastics for interdigitation

2007-01-17 Full mouth brackets debonding

RESULTS

Treatment was completed within 15 months and a desirable occlusion after the active treatment was achieved (Fig.7-9). Cephalometric analysis data and superimposition (Fig.10-11) showed the correction of the axis of the upper and lower incisors.

DISCUSSION

1. ISW Expansion Arch

In the past, it's very difficult to "labially" expand one specified section of the dental arch, especially lower arch. With ISW Expansion Arch, we can specifically expand the section where we want to. In this case, (1) straight wire expansion corrected the terminal second molar first, and then (2) the other unilateral scissors bite was corrected with ISW sectional Expansion Arch with crown buccal torque within 7 months. (Fig.12-13)

2. Torque correction by bracket upside-down and adding torque on ISW wire

Traditionally, occlusal splint for bite opening and cross elastics between the upper molar bracket and the lower molar lingual button were suggested to correct scissors bite. But in this case, we simply used (1) bracket upside-down method and (2) torque on the ISW wire to correct posterior scissors bite at an early stage. (Fig.14)

3. Not-in-slot

It is not necessary to change the bracket position or to add wire bending when we want to intrude or extrude a single tooth to a small extent. In this case, archwire was not engaged into the bracket slot. It was placed under the bracket (not-in-slot). One month later, #15 was intruded (to alleviate the interference) to facilitate correction of lower 4, 5 scissors bite. (Fig.15)

4. Bite control

In this case, bite raising (Fig.16) was due to scissors bite correction and molar extrusion (IME) & growth. (mandibular plane angle was increased about 3 degrees: from 27.6° to 30.9 °)

5. Timing

Timing for starting orthodontic treatment is usually considered after both upper and lower second molars were erupted to have better molar and bite control. But in a scissors bite case, we started orthodontic treatment before the upper second molar was erupted (Fig.17) so as to avoid the interference from the antagonist upper second molar.

Fig 1. *Facial photos- before treatment*

Fig 2. *Intraoral photos- before treatment*

Fig 3. *X-ray before treatment*

	Value	Mean	S.D.	Diff.	SD diff.
Facial angle	83.8	85.07	5.76	-1.25	-0.22
★ Convexity	13.6	5.60	4.33	7.96	1.84
A-B plane	-7.0	-5.10	3.28	-1.92	-0.59
Mandibular plane	27.6	26.25	6.34	1.35	0.21
Y-axis	64.3	65.71	3.27	-1.38	-0.42
Occlusal plane	11.0	9.52	4.01	1.48	0.37
★ Interincisal	115.8	129.66	8.99	-13.87	-1.54
L-1 to Occlusal	26.6	21.69	6.03	4.95	0.82
L-1 to Mandibular	100.1	94.67	7.21	5.38	0.75
U-1 to A-P plane	13.4	7.86	2.31	5.57	2.41
FMIA	52.4	58.98	6.69	-6.63	-0.99
FH to SN plane	6.2	5.98	3.35	0.19	0.06
SNA	84.3	81.82	3.09	2.47	0.80
SNB	78.2	78.61	3.14	-0.44	-0.14
SNA-SNB diff.	6.1	3.28	2.66	2.84	1.07
★ U-1 to N-P plane	17.5	9.91	2.78	7.63	2.74
★ U-1 to FH plane	116.6	108.94	5.62	7.63	1.36
★ U-1 to SN plane	110.4	103.06	5.53	7.33	1.33
Gonial angle	120.1	119.38	5.83	0.71	0.12
Ramus inclination	87.5	87.36	4.14	0.15	0.04

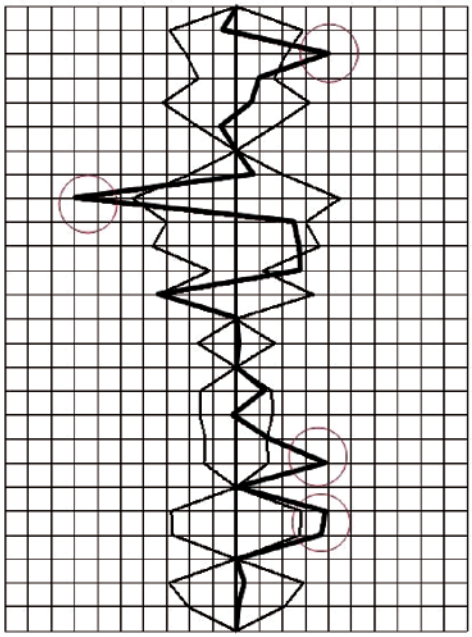


Fig 4. *Cephalometric analysis data*

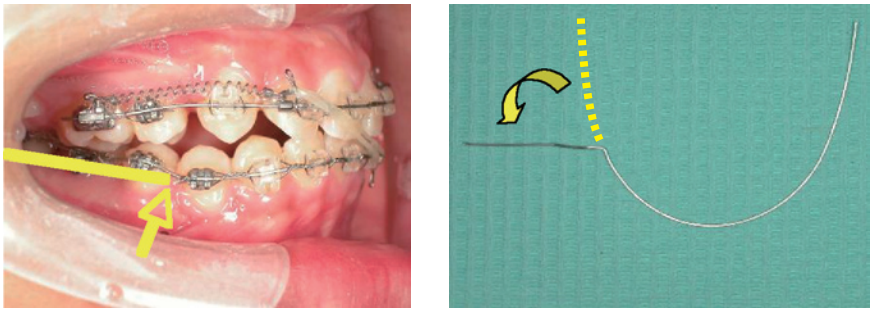


Fig 5. *straight wire expansion with crown buccal torque*

Fig 6. *#15 not-in-slot for intrusion, #44, #45 sectional expansion arch*

Fig 7. *Facial photos- after treatment*

Fig 8. *Intraoral photos- after treatment*

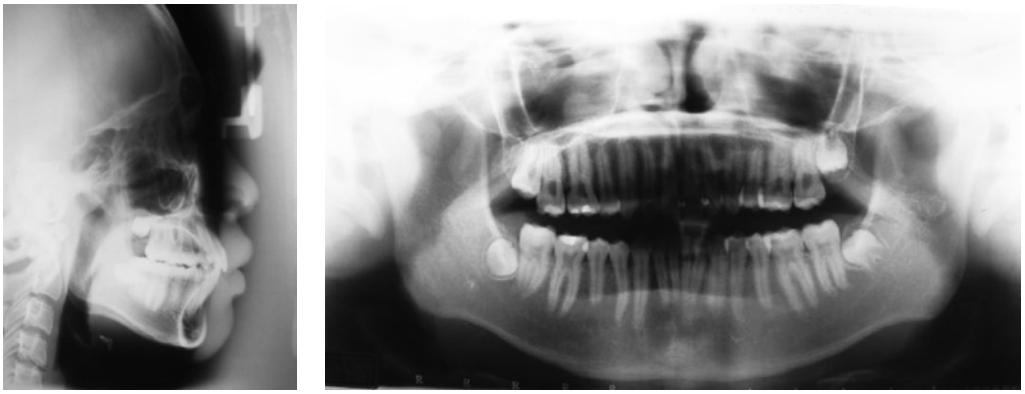


Fig 9. *X-ray after treatment*

	Before	After	Mean	SD.
Facial angle	83.8	81.0	85.07	5.76
Convexity	13.6	12.1	5.60	4.33
A-B plane	-7.0	-5.9	-5.10	3.28
Mandibular plane	27.6	30.9	26.25	6.34
Y-axis	64.3	67.4	65.71	3.27
Occlusal plane	11.0	19.2	9.52	4.01
Interincisal	115.8	116.4	129.66	8.99
L-1 to Occlusal	26.6	29.1	21.69	6.03
★ L-1 to Mandibular	100.1	107.5	94.67	7.21
U-1 to A-P plane	13.4	9.3	7.86	2.31
FMIA	52.4	41.6	58.98	6.69
FH to SN plane	6.2	5.9	5.98	3.35
SNA	84.3	81.1	81.82	3.09
SNB	78.2	76.1	78.61	3.14
SNA-SNB diff.	6.1	5.0	3.28	2.66
U-1 to N-P plane	17.5	13.5	9.91	2.78
★ U-1 to FH plane	116.6	105.3	108.94	5.62
U-1 to SN plane	110.4	99.3	103.06	5.53
Gonial angle	120.1	118.6	119.38	5.83
Ramus inclination	87.5	92.3	87.36	4.14

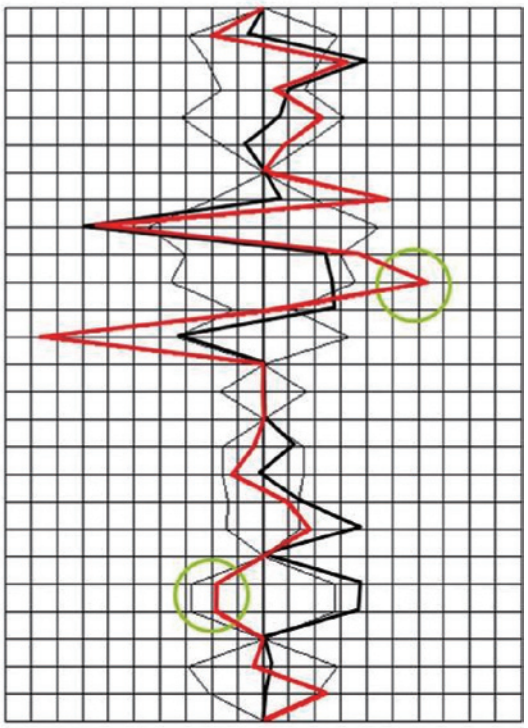
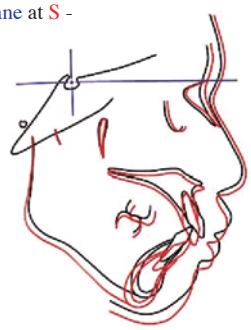


Fig 10. *Cephalometric analysis data before and after treatment*

Superimposition (1)

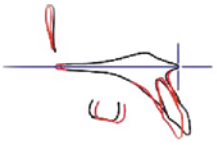
- Superimposed on SN plane at S -

14y04m **before**
15y06m **after**



Superimposition (2)

- Superimposed on Palatal plane at ANS -



- Superimposed on Mandibular plane at Me -

14y04m **before**
15y06m **after**

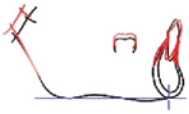


Fig 11. *Superimposition*

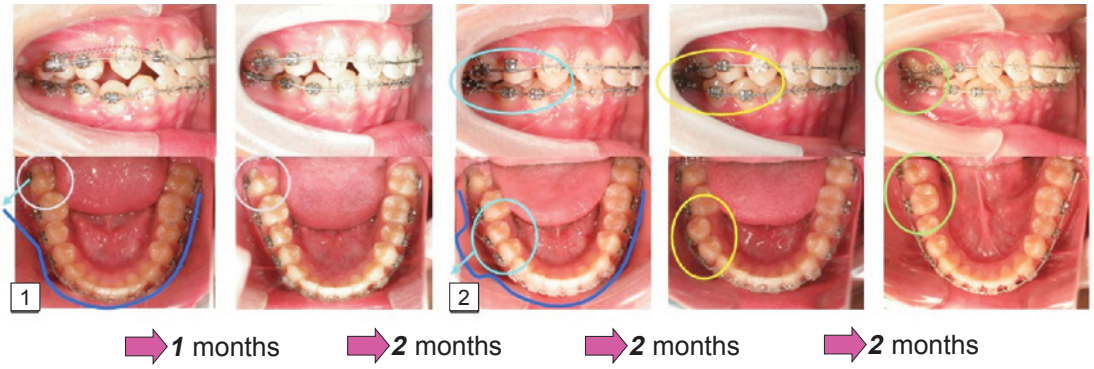


Fig 12. *ISW Expansion Arch (treatment process)*

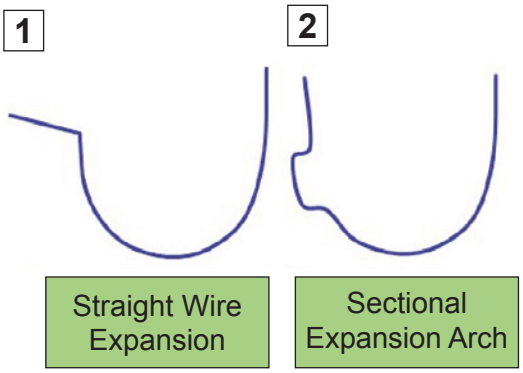


Fig 13. *Straight and sectional expansion arch*

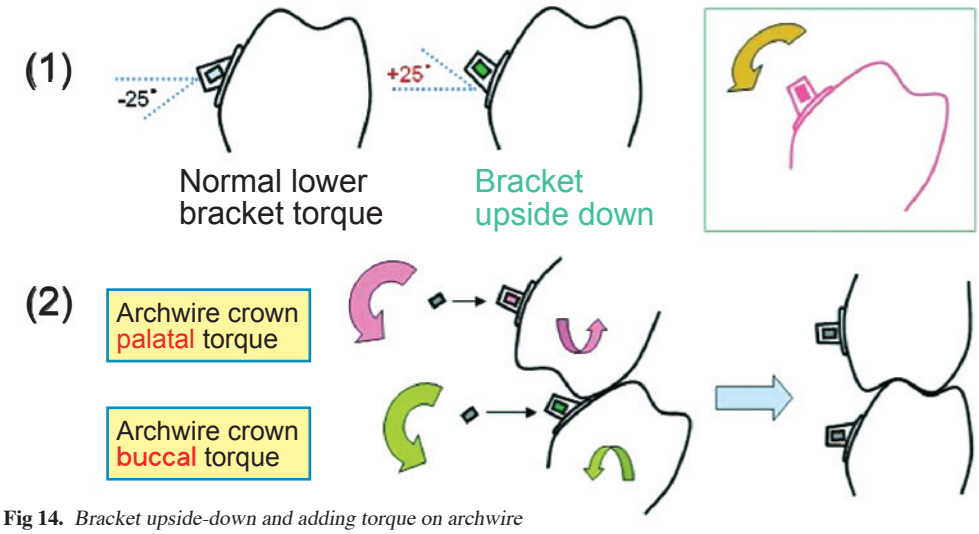


Fig 14. *Bracket upside-down and adding torque on archwire*

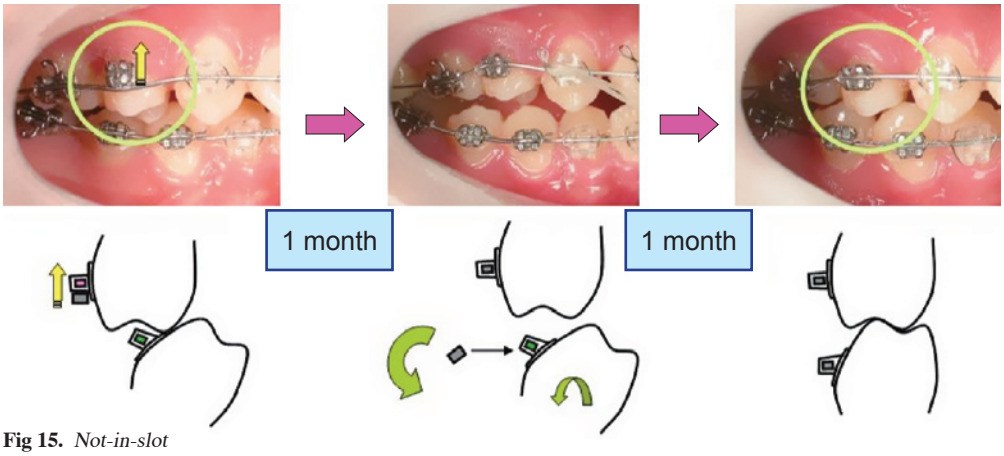


Fig 15. *Not-in-slot*

Fig16. *Bite raising*

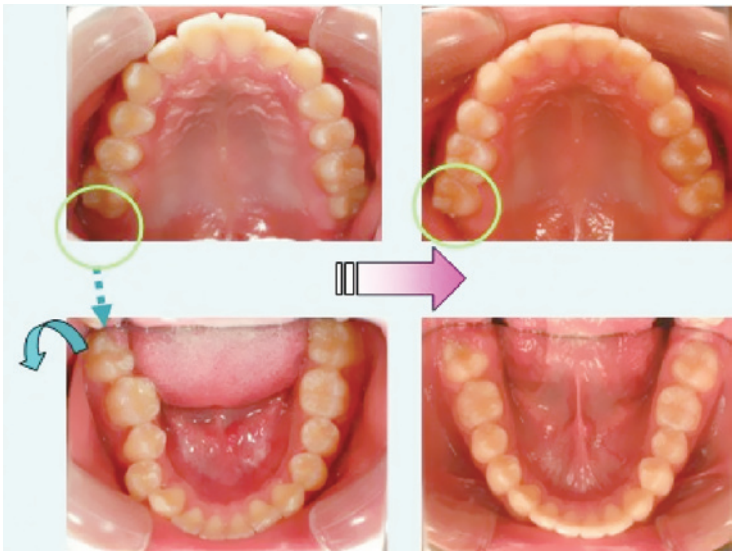


Fig 17. *Treatment timing*

CONCLUSION

Treatment of posterior scissors bite case is always a challenging scope of orthodontics in its difficulty and time consuming. Conventionally, it is necessary to use occlusal splint for bite opening and cross elastics in order to correct scissors bite. However, with ISW Expansion Arch technique and reverse torque by bracket upside-down, scissors bite correction becomes much easier and orthodontists can avoid imposing too much inconvenience on the patient. After 15 months of active treatment, a stable occlusion and a desirable cusp interdigitation were successfully achieved. Therefore, posterior problems such as scissors bite can be treated with ISW combined with a favorable torque control.

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症例報告–安格式II級1類單側剪刀狀咬合之治療

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〔治療目標〕介紹使用LH（low hysteresis）矯正技術治療安格式II級1類症例之報告。〔症例說明〕一名14歲的男性到台中市中國醫藥大學齒顎矯正科尋求矯正治療，其主訴為暴牙，同時因為右下側無法咬合導致咀嚼困難。與病人及家長溝通後，決定拔除#14及#24兩顆牙齒以減少其門牙水平覆蓋。本症例利用將矯正器倒置（bracket upside down, b-u-d）之觀念，同時在LH矯正線上加入牙冠頰側扭矩（crown buccal torque）及擴大弓（Expansion Arch），可以有效率地治療其單側的剪刀狀咬合。治療時間總計為15個月。〔討論及摘要〕治療單側廣範圍的剪刀狀咬合一直以來都是矯正治療的難題，一般而言，為了提高咬合以利牙齒移動，矯正醫師慣用咬合板來墊高病人咬合，同時，會使用顎間橡皮筋以利牙齒相對移動。使用LH矯正線特殊的擴大弓技術，同時搭配矯正器倒置的觀念，可以避免上述做法並快速、簡單地治療此種症狀，以免造成病人的困擾及傷害。經過15個月的治療，達成理想的咬合狀態。 ***(J. Taiwan Assoc. Orthod. 22(3): , 2010)***

關鍵詞：單側剪刀狀咬合、擴大弓、LH矯正

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