3M℠ Health Care Academy

A hybrid approach: Maximizing esthetics in a complex occlusion

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Dr. Sturgill began his academic journey by attending King University where he earned dual degrees in biology and business administration. He received his DMD, MPH, orthodontic certificate, and DHEd from Arizona School of Dentistry & Oral Health. He then moved to Richmond, Va. while his wife completed Endodontic Residency at Virginia Commonwealth University. While there he joined the faculty as an Assistant Professor for VCU Orthodontic Department and received his ABO certification. He then moved to his hometown and bought a practice with locations in Johnson City, Tenn., and Norton, Va.

Introduction

Esthetic demands from patients has continued to place pressure on orthodontists and orthodontic manufactures alike. Previously, patients always felt orthodontic treatment was limited to “traditional braces.” As the adult population and esthetically-driven teen population continues to grow, options such as clear brackets, lingual appliances, and clear aligners have increased in popularity and demand. Orthodontists are pushed to be more creative in the treatment modality chosen for each case. In many situations, a hybrid appliance therapy can marry the biomechanical needs of the orthodontist and the esthetic needs of the patient. This case shows how the 3M™ Incognito™ Appliance System, 3M™ Victory Series™ Brackets, and 3M™ Unitek™ Temporary Anchorage Device (TAD) System can be utilized to treat a challenging clinical case esthetically.

Clinical Case

A 25-year-old Asian female presents for consultation with a chief complaint of mandibular crowding. She has a non-contributory medical and dental history, except for a lateral periodontal cyst at #26, which was addressed by a periodontist and resolved uneventfully (Figure 1). She has a balanced facial profile with slight mandibular asymmetry, as her left gonial angle is more prominent. Her smile arc is consonant with 95% incisal display upon smile. Her profile reveals a straight facial profile, a protrusive lower lip relative to the E-line, and an acute nasolabial angle (Figure 2A-H).

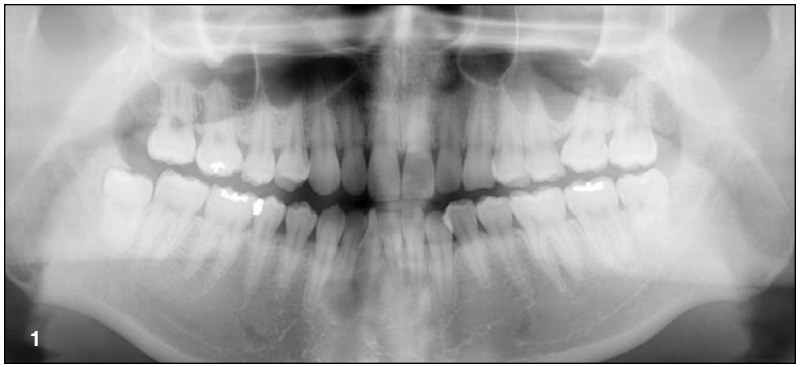
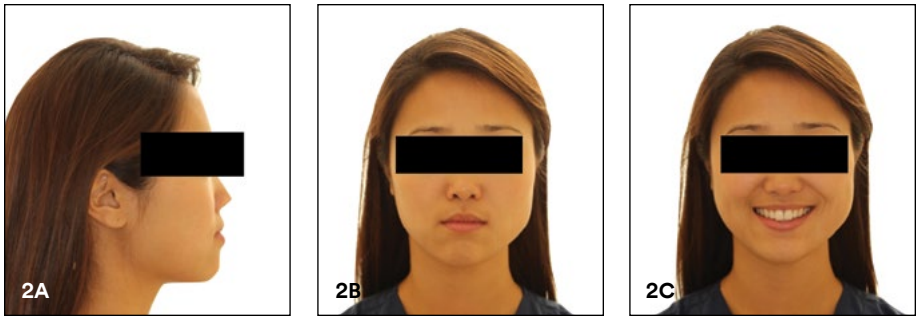


Figure 1



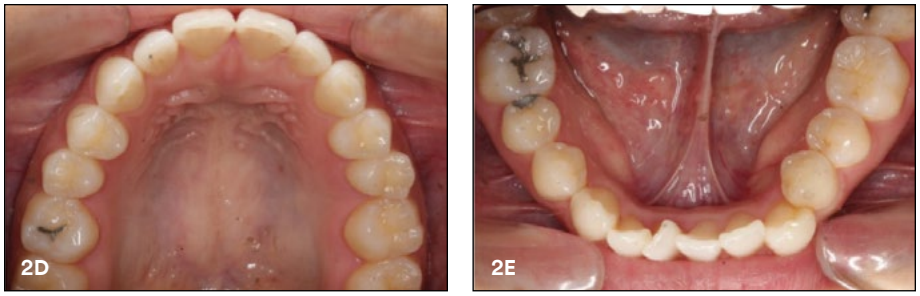


Figure 2A-H

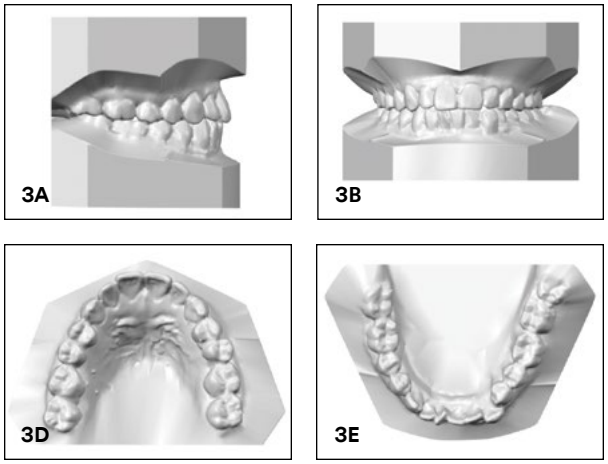


Figure 3A-E

Figure 4

	Value	Norm	Std Dev	Dev Nor
Maxilla to Cranial Base				
SNA (°)	80.2	82.0	3.5	-0.5
Mandible to Cranial Base				
SNB (°)	80.4	80.9	3.4	-0.2
SN – MP (°)	30.7	32.9	5.2	-0.4
FMA (MP-FH) (°)	25.4	23.9	4.5	0.4
Maxillo-Mandibular				
ANB (°)	-0.2	1.6	1	-1.2 *
Maxillary Dentition				
U1 – NA (mm)	10.6	4.3	2.7	2.3 **
U1 – SN (°)	112.4	102.8	5.5	1.7 *
Mandibular Dentition				
L1 – NB (mm)	8.3	4.0	1.8	2.4 **
L1 – MP (°)	95.1	95.0	7.0	0.0
Soft Tissue				
Lower Lip to E-Plane (mm)	2.0	-2.0	2.0	2.0 **
Upper Lip to E-Plane (mm)	-1.4	-5.0	2.0	2.3 **

Table 1

Intraoral exam reveals a Class III subdivision dental relationship with a 2 mm overjet and a 0.5 mm overbite (Figure 3A-E). Her mandibular midline is to the right of facial by 5 mm (Figure 2A-H). Her cephalometric radiograph shows a Class III tendency due to mandibular prognathism, proclined incisors, and a protrusive lower lip (Figure 4 and Table 1).

Treatment Objectives:
The patient's chief complaint, "I want to align my midline and incisors," was pivotal in the treatment planning process. Therefore, the treatment planning objectives included establishment of Class I canines, alleviate crowding, attain ideal overjet/overbite, improve lip balance, and alignment of facial and dental midlines.

Treatment options:
1. No treatment
2. Extraction of LL4, TAD placement for maximum anchorage, and finish Class III molar left
3. Extraction of LL2 with risk of black triangle and lack of midline alignment
4. Non-extraction with asymmetrical BSSO if facial asymmetry was the chief concern

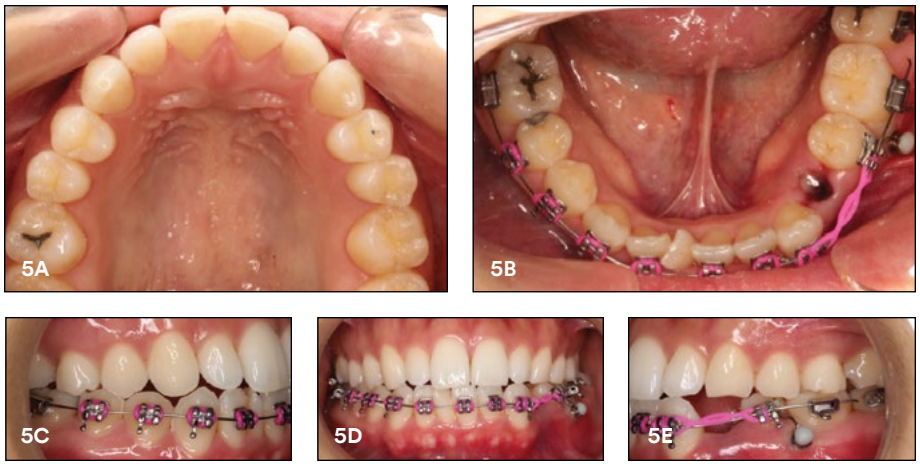


Figure 5A-E

Treatment:
Patient opted for the treatment option #2 to extract LL4 and did not want any appliances to show on her maxillary arch. Her mandibular arch was bonded with 0.022 3M™ Victory Series™ Brackets (3M™ MBT™ System prescription) and an 0.014 Nitinol was placed. Since the vast majority of her orthodontic treatment was on the mandibular arch, the maxillary treatment was delayed (Figure 5A-E). After the extraction was complete, a 6 mm Unitek TAD was placed between the LL5 and LL6 and was bonded with flowable and an 0.019×0.025 stainless steel archwire to the LL5.

Figure 6A-E shows treatment progression at four months. To expedite the rotation of the LR1, a buccal and lingual button was added with buccal and lingual power chain to create a couple (Figure 7A-E). At nine months into treatment the maxillary arch was bonded with the Incognito Appliance and an 0.014 Nitinol was placed on the

Figure 6A-E

Figure 7A-E

maxillary arch and a 0.016×0.022 Nitinol on the mandibular as the LR1 was engaged (Figure 8A-E). The case was finished with 0.016×0.022 Nitinol on the maxilla and 0.019×0.025 TMA on the mandible (Figure 9A-E). The case was completed in 18 months and retained with an individually bonded lingual retainer from LL5 to LR3 and maxillary and mandibular Essix (Figure 10A-H).

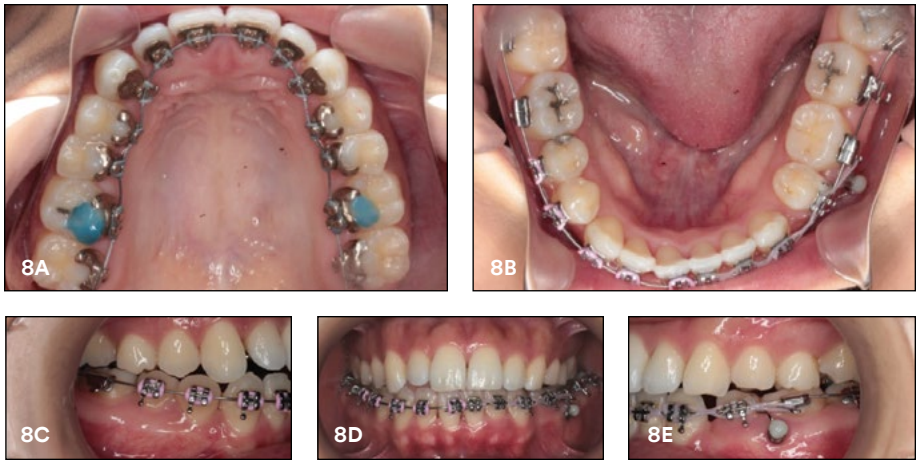


Figure 8A-E

Figure 9A-E

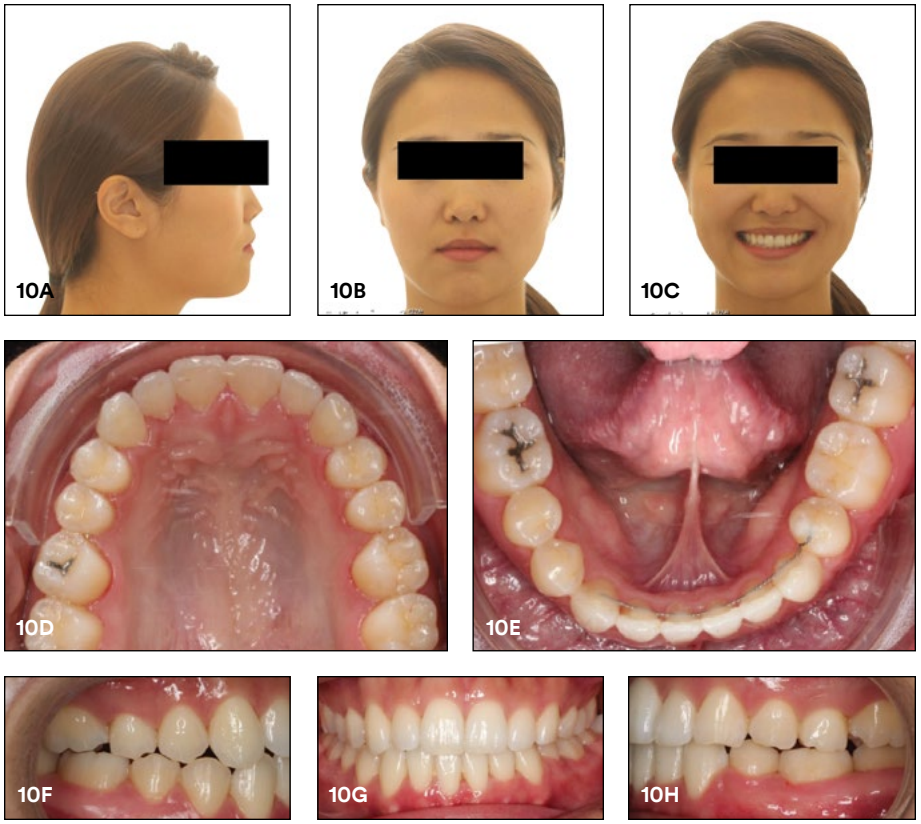


Figure 10A-H

Evaluation:
The panoramic progression can be seen in Figure 11A-C, which shows parallel roots at the extraction site. The final cephalometric and superimposition show retraction of the mandibular incisors along with retraction of the mandibular lip (Figures 12A-B). The facial profile change is subtle but notable (Figure 13A-B). The maxillary arch showed transverse development along with archform development (Figure 14A-B). Lastly, the substantial change to the midline alignment and achievement of the patient's chief complaint can be seen in Figure 15A-B.

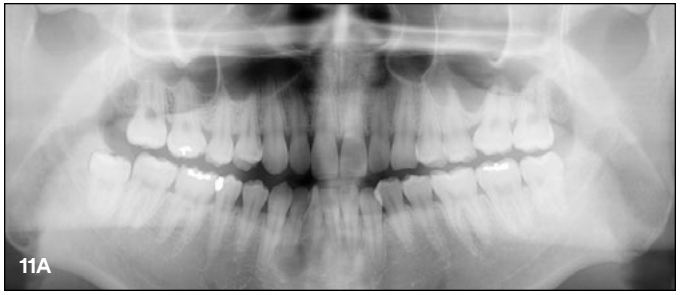


Figure 11A-C

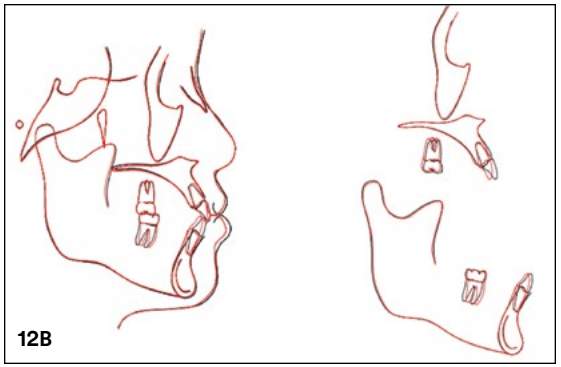


Figure 12A-B

Figure 13A-B

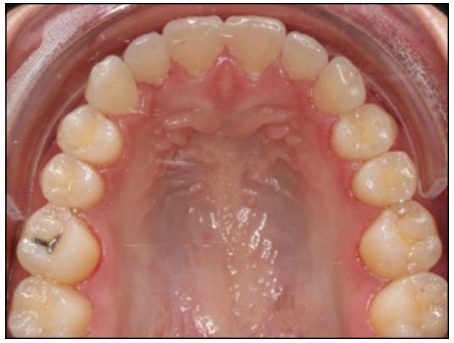


Figure 14A-B

Figure 15A-B

Conclusions:
This case demonstrates how a moderately difficult case can be esthetically treated without any compromises in the quality of result delivered. The use of auxiliaries such as a TAD when judiciously applied can increase treatment predictability. Lastly, the use of hybrid appliances and/or auxiliaries does not add time to treatment length, as the above case was treated in 18 months and 12 visits (bonding to debond).

Case photos provided by Dr. Jeremiah Sturgill.