INDONESIAN JOURNAL OF ORTHODONTICS CASE REPORT

Orthodontic Management of Skeletal Class III Malocclusion with Transversal Discrepancy and Multiple Diastemas – A Case Report

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Abstract

Introduction: Skeletal Class III malocclusion is the least prevalent type of skeletal malocclusion. It is usually accompanied by transverse discrepancies, resulting in anterior crossbite, midline deviation and spacing issues. This indicates the need for orthodontic treatment. **Case Report:** An 18-year-old patient presented with a primary concern of spaces between their teeth and uneven teeth. Clinical examination showed upper and lower midline shifted to the right with inadequate overbite and overjet. A crossbite was identified, and microdontia resulted in multiple diastemas. Radiographic examination showed a skeletal Class III malocclusion. The treatment plan included the use of 0.022-inch MBT bracket system along with composite restoration for diastema closure. **Discussion:** The occlusion was corrected after 18 months of treatment and anterior crossbite and diastema were resolved, overbite and overjet were improved. Extraoral assessment also showed an increase in vertical dimension. **Conclusion:** The treatment successfully resolved patient's issues of diastema and uneven occlusion using camouflage orthodontics method and composite resin restoration.

Keywords: Skeletal Class III malocclusion, Transversal discrepancy, Multiple diastemas

INTRODUCTION

Skeletal Class III malocclusion is the least prevalent type of skeletal malocclusion. This malocclusion is more common in Asian populations and tends to run in families, highlighting hereditary and ethnic etiological factors. Transverse issues such as crossbite often occur with this malocclusion and are further complicated by dental anomalies such as spacing issues and variations in tooth dimensions.[1]

Transverse malocclusion presents unique challenges in orthodontic management as it affects both anterior and posterior teeth. Anteriorly, this condition often manifests as midline shift, while crossbite may be found posteriorly. If left untreated, it can lead to asymmetry and long-term occlusal instability. An effective treatment strategy must be adapted to different cases given the complexity of this malocclusion.[2]

Management of transverse and Class III malocclusions requires a more careful approach, especially when patients decline orthognathic surgery. Camouflage orthodontics may be used as an alternative by utilizing dentoalveolar compensation, achieved by proclining maxillary incisors and retroclining mandibular incisors. In this case, conventional metal brackets, along with cross-elastics, are utilized, enabling crossbite and midline correction.[3,4]

This case addresses skeletal Class III malocclusion with transversal discrepancy and multiple diastemas. Conventional braces were chosen for occlusal correction and space closure

according to patient preference.

DIAGNOSIS AND ETIOLOGY

An 18-year-old patient came with a chief complaint of spaces between their teeth and uneven teeth. Clinical examination (Figure 1) revealed a midline shift to the right, an overbite of 0 mm, an overjet of 1 mm and an anterior crossbite involving tooth 12 and teeth 42 and 43. A genetic predisposition factor and microdontia of teeth 12 and 22 resulted in anterior diastemas. Occlusal analysis confirmed a Class I type 1 and type 3 dental relationship, with a skeletal Class III malocclusion confirmed using radiographs (Figure 2).

TREATMENT OBJECTIVES

The treatment objectives are to improve midline coordination in both arches, resolving multiple diastemas and crowding by utilizing straight-wire appliance (SWA) with McLaughlin, Bennett and Trevisi (MBT) prescription and composite filling. Sagittally, the plan is to camouflage the skeletal Class III pattern and correct the anterior crossbites involving the three anterior teeth. Vertically, the goal is to increase overbite to about 2 mm, utilizing stainless-steel rectangular archwires.

TREATMENT ALTERNATIVES

The definitive treatment for severe Class III cases is orthognathic surgery. However, in borderline cases, where incisors inclinations and dental compensations are acceptable, camouflage orthodontics is recommended, especially if the patient declines surgery.[5] Closure of space using composite restoration also results in acceptable esthetics with high five-year survival rate, supporting its use with tooth-size discrepancies.[6]

TREATMENT PROGRESS

The treatment duration was 18 months. In the maxillary arch, molar bands and buccal tubes were placed on 17, 16, 26, and 27, followed by bonding of an SWA with MBT prescription, 0.022-inch slot, on 15, 14, 13, 12, 11, 21, 22, 23, 24, and 25. Levelling and alignment were accomplished with a progressive nickel–titanium sequence (0.014 → 0.016 → 0.018 → 0.016×0.022 NiTi) using cinchback bends for terminal anchorage control and to prevent wire migration. Space closure was then undertaken and coordinated with restorative reshaping of teeth 12 and 22 using composite resin. Finishing and occlusal detailing were completed with stainless-steel rectangular 017×0.025 archwires, after which the maxillary arch was stabilized and transitioned to retention. In the mandibular arch, molar bands and buccal tubes were placed on 47, 46, 36, and 37, and SWA MBT (0.022-inch) brackets were bonded on 45, 44, 43, 42, 41, 31, 32, 33, 34, and 35. The same progressive NiTi sequence with cinchback management was used for leveling and alignment. Distalization of canines 43 and 33 was achieved using stainless-steel 0.016×0.022 archwires with incorporated T-loop mechanics plus cinch-back to reinforce anchorage and deliver controlled distal force. Final finishing and occlusal adjustment employed 0.017×0.025 stainless-steel, followed by stabilization and placement on retention.

TREATMENT RESULT

Results of the treatment are the closure of diastema (chief complaint), corrected midline, resolved diastema in anterior teeth, increased overbite 0.5 mm to 2 mm and overjet from 1 mm to 2 mm (Figure 3). Extraorally, the correction in

Fig 1. Initial examination

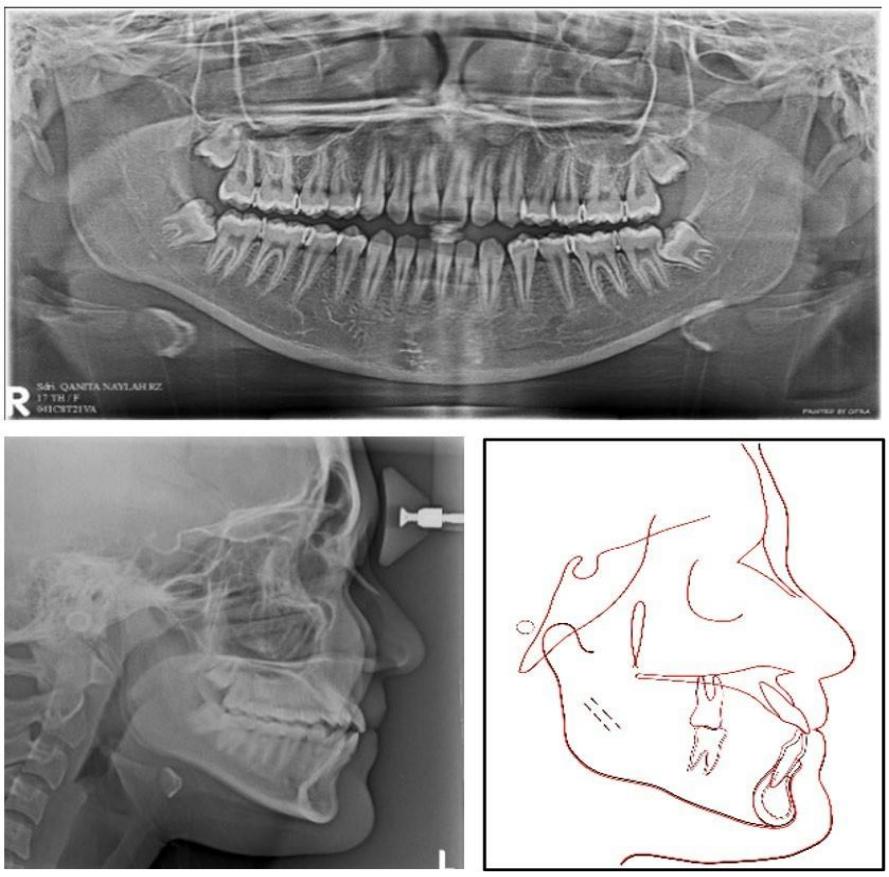

Fig 2. Pre-treatment panoramic and cephalometric radiograph

Fig 3. Post-treatment photograph

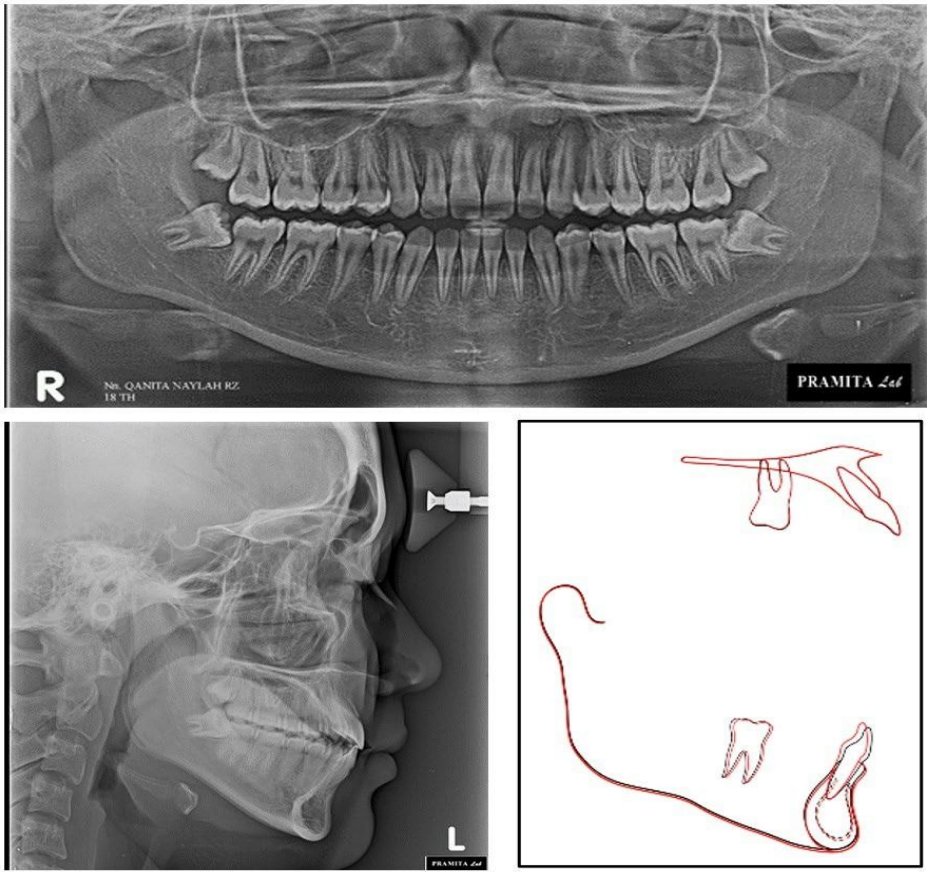

Fig 4. Pre-treatment panoramic and cephalometric radiograph

Table 1. Post-treatment cephalometric measurem ent

	Normal	Pre	Post
SNA	82 ± 2	79	79
SNB	80 ± 2	81	81
ANB	2 ± 2	-2	-2
Dental Analysis			
U1 – NA (mm)	4 ± 2	5	5
U1 – NA (°)	22 ± 2	20	20
L1 – NB (mm)	4 ± 2	5	4
L1 – NB (°)	25 ± 2	25	23
Interincisal (°)	135 ± 5	130	133
Facial Analysis			
E-line to upper lip(mm)	1 ± 2	3	3
E-line to lower lip(mm)	0 ± 2	2	2
Nasolabial (°)	1 ± 2	3	3

overbite also increases the lower third facial height, improving facial balance. Post-treatment radiographs confirmed stable root positions and improvements sagittally (Figure 4).

DISCUSSION

The treatment outcomes in this case are consistent with the studies conducted by Araujo and Squeff et al., which state that orthodontic camouflage can resolve skeletal Class III malocclusion cases without surgery. This camouflage approach was performed by correcting the crossbite, midline deviation, and diastema to improve the patient's bite appearance. Similarly, the study by Park et al. highlights that this method is a reliable and stable non-surgical option for patients who refuse surgical treatment.[4,7]

Orthodontic camouflage remains a good alternative for addressing skeletal Class III malocclusion. The study by Kuo and Kuo demonstrated that this method can improve occlusal harmony through dentoalveolar compensation, emphasizing its non-invasive nature, aesthetic improvement, and long-term stability. However, since this procedure only corrects the discrepancy dentally and not skeletally, some drawbacks may arise, such as excessive incisor proclination and a higher risk of relapse. Therefore, longterm retention is necessary to prevent relapse.[8]

Camouflage orthodontics is prone to relapse. A study conducted by Mattos et al. found that relapse risk in camouflage treatments is relatively high. Similarly, research by Morais et al. underlined that diastema cases also have a higher likelihood to relapse, making retainers essential for camouflage treatments involving diastema. Additionally, patient education is essential in eliminating bad oral habits and improving discipline to ensure long-term stability.[9,10]

Overall, this case confirms the effectiveness of orthodontic camouflage procedure in treating skeletal Class III malocclusion. Transverse discrepancies and aesthetics were corrected without invasive procedure. However, due to the higher risk of relapse, long-term stability relies heavily on patient cooperation and proper retention.

CONCLUSIONS

This case report demonstrates that non-surgical treatment successfully addressed transverse discrepancies with multiple diastemas in skeletal Class III malocclusion using orthodontic

camouflage technique in conjunction with composite resin restoration. Midline position, overbite, overjet, and anterior crossbite were corrected after 18 months of treatment, with cephalometric values remaining within the normal range.

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