Class III Malocclusion Camouflage Treatment Using a Conventional Orthodontic Appliance in a Non-Growing Patient

Fransiska Monika  
*Department of Orthodontics, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia,*  
fransiska_monika@ymail.com

Retno Widayati  
*Department of Orthodontics, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia,*  
widayati22@yahoo.com

Follow this and additional works at: [https://scholarhub.ui.ac.id/jdi](https://scholarhub.ui.ac.id/jdi)

Part of the [Orthodontics and Orthodontology Commons](https://scholarhub.ui.ac.id/jdi)

**Recommended Citation**

Class III Malocclusion Camouflage Treatment Using a Conventional Orthodontic Appliance in a Non-Growing Patient

Cover Page Footnote
The author would like to thank Dr. Ignatia Wulandari for her contribution to this study.

This case report is available in Journal of Dentistry Indonesia: https://scholarhub.ui.ac.id/jdi/vol30/iss1/1
CASE REPORT

Class III Malocclusion Camouflage Treatment Using a Conventional Orthodontic Appliance in a Non-Growing Patient

Fransiska Monika, Retno Widayati*

Department of Orthodontics, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia
*Correspondence e-mail to: widayati22@yahoo.com

ABSTRACT

The treatment of skeletal and dental Class III malocclusions is a challenge for orthodontists, and one of the treatment alternatives for a non-growing patient is orthodontic camouflage treatment. Different approaches may result in different outcomes; therefore, a proper diagnosis and treatment plan are needed to avoid undesirable effects. In this case, a 21-year-old female patient presented with a skeletal Class III malocclusion, with a normal maxilla, prognathic mandible, moderate crowding, and an acceptable facial profile. The treatment modality for orthodontic camouflage treatment was a conventional orthodontic appliance with the extraction of mandibular first premolars to resolve crowding. At the end of the treatment, a Class I canine and incisor relationship was achieved while maintaining a Class III molar relationship. After 25 months of treatment, the patient had a more pleasant smile with improved functional occlusion.

Key words: class III malocclusion, conventional appliance, orthodontic camouflage treatment

INTRODUCTION

The prevalence of Class III malocclusion varies widely from 0.7% (Israel) to 19.9% (China), with more prevalence in permanent dentition than in mixed dentition and in Mongoloids than in other races. Class III malocclusions may present several skeletal and dental problems, such as mandibular skeletal protrusion, maxillary skeletal retrusion, a combination of both, or no abnormalities of both. Proclined maxillary incisors and retroclined mandibular incisors may result in dentoalveolar compensation.

In non-growing patients, treatment alternatives are combined with orthognathic surgery or orthodontic camouflage treatment. Orthognathic surgery is usually recommended for severe skeletal Class III cases, while camouflage treatment can be carried out in patients with mild to moderate skeletal Class III malocclusion. The methods used in camouflage treatment are primarily dentoalveolar changes; these may include teeth extractions, mandibular teeth distalizations, and Class III intermaxillary elastics. Treatment decisions should be based on skeletal discrepancies, dental abnormalities, and facial profiles. Proper diagnosis is necessary to establish realistic treatment goals and minimize undesirable outcomes.

This case report presents a camouflage treatment for skeletal Class III malocclusion with the extraction of mandibular first premolars in a non-growing patient.

CASE REPORT

A 21-year-old female came to the orthodontic clinic at the Dental and Oral Hospital Faculty of Dentistry, Universitas Indonesia, complaining of her irregularly arranged lower front teeth. An extraoral examination revealed a dolichofacial and symmetric face with a slightly concave profile. The intraoral examination showed moderate crowding, +1 mm anterior overjet and overbite, crossbite of the maxillary lateral incisors, 90°-rotated right maxillary second premolar, and Class III canine and molar relationships. Her maxillary dental midline deviated 2 mm to the right, while her mandibular dental midline coincided with the facial axis. There was no premature contact or functional displacement during jaw opening or closing. She also had good oral hygiene, healthy periodontal tissues, and a complete set of teeth (Figure 1). A lateral cephalometric analysis showed a Class III skeletal pattern with a normal maxilla, prognathic mandible,
con cave skeletal profile, and proclined maxillary incisors. The panoramic radiograph revealed an impacted left mandibular third molar (Figure 2).

The treatment objectives were to improve occlusion, relieve crowding, correct the displaced right maxillary second premolar and anterior crossbite, and achieve the ideal overjet and overbite. The ideal treatment was to combine orthodontic and surgical therapy to improve the facial profile; however, the patient refused to undergo surgery and chose camouflage treatment using fixed orthodontic appliances with the extraction of mandibular first premolars.

The mandibular first premolar was extracted before bracket bonding. All teeth were bonded with Mini Diamond Twin brackets (0.22 slot; Ormco, Glendora, California) an MBT™ bracket prescription. All central and lateral mandibular incisors were bonded after the mandibular canines were distalized to prevent flaring of the anterior mandibular teeth. The crossbite on the maxillary lateral incisors was corrected by protracting the central incisors. The right maxillary second premolar was corrected using two forces by bonding buttons on the mesial and distal sides of the tooth.

Aligning and leveling of all teeth were achieved in 8 months using a 0.019 × 0.025-in nickel-titanium archwire in the maxilla and a 0.017 × 0.025-in nickel-titanium archwire in the mandible. Space closure on the mandibular teeth was completed in 10 months using an elastomeric chain and Class III elastics with a 0.018 × 0.025-in stainless-steel archwire. Some brackets were repositioned to improve occlusion and interdigitation. After 25 months of treatment, the fixed orthodontic appliance was removed. In the retention phase, vacuum-formed Essix retainers were used on both arches.
At the end of the treatment, there were no significant changes in the soft tissue profile, but a more pleasant and attractive smile was achieved (Figure 3). A normal overjet and overbite with a Class I canine relationship were also achieved while maintaining a Class III molar relationship. The rotated right maxillary second premolar was corrected, and crowding on both arches was relieved.

The lateral cephalometric radiograph evaluation showed changes in skeletal and dental parameters after 25 months of treatment (Figure 4, Figure 5). The angle between the mandible and the maxilla (ANB), improved from -4° to -3° and the angle of convexity improved from -10° to -8°. The angle of the maxillary incisor to the maxillary plane decreased from 126° to 115°, whereas the angle of the mandibular incisor to the mandibular plane decreased from 86° to 80°. These changes increased the interincisal angle from 118° to 135°. Table 1 shows the details of the cephalometric measurements.

### DISCUSSION

Camouflage treatment can be an alternative for patients with mild to moderate Class III malocclusion and an acceptable facial profile. Studies have shown that camouflage treatment in moderate skeletal Class III malocclusion provides long-term stability and satisfactory outcomes. Changes in skeletal, dental, and soft tissue can be camouflaged without undesirable effects on the periodontium, such as gingival recessions. Therefore, proper diagnosis and realistic treatment outcomes should be made by the orthodontist in collaboration with the patient.

In this case, the patient refused orthognathic surgery and chose a camouflage treatment involving extraction of the mandibular first premolars. The patient initially had a positive overjet and overbite on the central incisors and a suitable thickness of mandibular symphysis to allow retraction of the mandibular incisors. The patient also had moderate crowding, and the extraction spaces were used to relieve crowding and retract the anterior teeth on the mandible. We maintained a Class III molar relationship and a Class I incisor and canine relationship.

By maintaining the Class III molar relationship, we avoided the need for further dental extractions to pursue a Class I molar relationship, as the patient originally had a full Class III molar relationship. The Class III molar type of occlusion is also known as therapeutic Class III occlusion. Previous studies have shown that therapeutic Class III occlusion was viable with good occlusal stability and periodontal health after 13–14 years of follow-up. Another study also showed stability after three years of follow-up with a Class I canine and Class III molar relationships. The ANB angle improved from -4° to -3° and the angle of convexity improved from -10° to -8° due to the retraction of the lower anterior teeth to lingual, which affects point B and reduces the concavity of the skeletal profile. The angle of the maxillary incisor to the maxillary plane decreased from 126° to 115°, and the inclination became more upright due to the torque expression using a 0.019 × 0.025-in archwire. The interincisal angle is one of the anterior teeth’s stability parameters, ranging from 1,250° to 135°.

### Table 1. Lateral cephalometric measurements.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Mean</th>
<th>SD</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horizontal Skeletal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNA (°)</td>
<td>82</td>
<td>2</td>
<td>84</td>
<td>84</td>
</tr>
<tr>
<td>SNB (°)</td>
<td>80</td>
<td>2</td>
<td>88</td>
<td>87</td>
</tr>
<tr>
<td>ANB (°)</td>
<td>3</td>
<td>2</td>
<td>-4</td>
<td>-3</td>
</tr>
<tr>
<td>The Wits (mm)</td>
<td>1</td>
<td>2</td>
<td>-12</td>
<td>-10</td>
</tr>
<tr>
<td>Angle of convexity (°)</td>
<td>0</td>
<td>10</td>
<td>-10</td>
<td>-8</td>
</tr>
<tr>
<td><strong>Vertical Skeletal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y-axis (°)</td>
<td>60</td>
<td>6</td>
<td>55</td>
<td>56</td>
</tr>
<tr>
<td>Go-angle (°)</td>
<td>123</td>
<td>7</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>SN-mandibular plane (°)</td>
<td>32</td>
<td>3</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>MMPA (°)</td>
<td>27</td>
<td>4</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>LAFH (%)</td>
<td>55</td>
<td>2</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td><strong>Anterior Dental</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interincisal angle (°)</td>
<td>135</td>
<td>10</td>
<td>118</td>
<td>135</td>
</tr>
<tr>
<td>U1-palatal plane (°)</td>
<td>109</td>
<td>6</td>
<td>126</td>
<td>115</td>
</tr>
<tr>
<td>L1-mandibular plane (°)</td>
<td>93</td>
<td>4</td>
<td>86</td>
<td>80</td>
</tr>
<tr>
<td><strong>Soft Tissue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper lip—E Line (mm)</td>
<td>1</td>
<td>2</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>Lower lip—E Line (mm)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
There were no significant changes in the patient’s facial profile, as the changes were mainly dentoalveolar. In addition, MMPA and LAFH represented vertical parameters, and there were reasonable controls for the vertical dimensions during the treatment. In non-growing patients in whom permanent dentition has been established, orthodontic treatment is aimed at compensating for the skeletal discrepancy by proclining the maxillary incisors and retroclining the mandibular incisors to achieve an ideal overjet and overbite. In this case, the maxillary incisors were proclined at the beginning of the treatment. We managed to set the maxillary incisors upright using a 0.019 × 0.25-in stainless steel archwire as the torque expression of the bracket. Meanwhile, the mandibular incisors were retroclined as we closed the extraction spaces in the mandible. Other studies also showed similar results in cases of mild to moderate skeletal Class III malocclusion.

The mandibular incisor retroclination may result in gingival recession and root prominence; therefore, great care must be taken to avoid unwanted effects. Periodontal care and dental plaque control were performed with careful canine distalization and incisor retraction. At the end of the treatment, a good occlusion and smile were obtained with normal gingival levels, and the patient was satisfied.

CONCLUSION

Patients with mild to moderate skeletal Class III malocclusions can benefit from orthodontic camouflage treatment as an alternative to improving functional occlusion and aesthetics. Proper diagnosis and treatment plans with careful execution and patient cooperation are needed to obtain satisfactory results.

ACKNOWLEDGMENT

The author would like to thank Dr. Ignatia Wulandari for her contribution to this study.

CONFLICT OF INTEREST

There were no conflicts of interest related to this case report.

REFERENCES


(Received January 21, 2023; Accepted March 6, 2023)