

## A 14-year-old boy having excessive overjet and traumatic bite

Salma Aktar, Sultana Razia Khanam, Mohammad Rafiqul Islam, Mahmood Sajedeem and Gazi Shamim Hassan

### Article Info

Department of Orthodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh

#### For Correspondence:

Salma Aktar  
drsalma2015ido@gmail.com

Received: 2 September 2019  
Accepted: 30 September 2019  
Available Online: 3 October 2019

ISSN: 2224-7750 (Online)  
2074-2908 (Print)

DOI: 10.3329/bsmmuj.v12i3.43280

**Keywords:** Malocclusion; Overjet; Traumatic bite

#### Cite this article:

Aktar S, Khanam SR, Islam MR, Sajedeem M, Hassan GS. A 14-year-old boy having excessive overjet and traumatic bite. Bangabandhu Sheikh Mujib Med Univ J. 2019; 12: 159-162.

#### Copyright:

The copyright of this article is retained by the author(s) [Attribution CC-BY 4.0]

#### Available at:

www.banglajol.info

A Journal of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

### Presentation of Case

*Dr. Salma Aktar (MS Resident):* A 14-year-old male came to the outpatient Department with the complaints of proclination of the tooth and inability to close his lips. The patient was psychologically depressed for his facial appearance. Extraoral clinical examination showed a mesocephalic symmetrical face with convex facial profile as well as his lower lip was trapped. The nasolabial angle was acute (Figure 1). His mandibular movement was normal and there was no temporomandibular joint dysfunction. Intraoral clinical examination also revealed class II molar and canine relationship. Furthermore, the maxillary incisors were found excessively proclined and the overjet was 13 mm. The palatal impingement of the lower incisors was also found (Figure 2). A soft tissue lesion observed on the lower lip due to chronic irritation by sharp tip upper right canine. Moreover, underlying sagittal jaw discrepancy was severe. As the patient did not allow any orthognathic surgery, the selective extraction of two maxillary first premolar teeth was decided.

### Pre-treatment Analysis

*Dr. Aktar:* The results of lateral cephalometric analysis (in degree) show that the Sella Nasion point A angle was 89. The Sella Nasion point B angle was 81. Point A Nasion point B angle, Frankfort mandibular plane angle and Frankfort mandibular incisor angle were 8, 16 and 61 respectively (Figure 3).

### Treatment Procedure

*Dr. Aktar:* Following extraction of the maxillary first premolars, the treatment was performed as follows: Stage 1: Anchorage preparation by transpalatal arch. Correction of deep overbite by the reverse curve of Spee in the lower arch. Stage 2: Leveling and alignment to correct intra-arch tooth positions by multiloop arch wire technique for tooth movement and achieve good arch form. The initial leveling was done in two stages (I and 2) by 0.014 and 0.016 inch

stainless steel round wire. The arch wire was ligated loosely so it does not exert any strong force on the teeth and causes any distortion. Stage 3: Leveling in high degree, using 0.016 inch stainless steel round wire. Stage 4: Maxillary canine retraction by elastic power chain, and using 0.016 inch stainless steel wire. Stage 5: After leveling, canine retraction was performed with 0.016 inch stainless steel wire and then rectangular NiTi (0.017 x 0.025 inch) wire was inserted for the correction of tipped and rotated canine. Stage 6: Arch contraction or anterior retraction of the maxillary incisors and correction of anterior and posterior relationship by using 0.017 x 0.025 stainless steel rectangular wire with vertical loop and torque to close the space. Vertical loop was activated 1 mm per visit. Stage 7: Establishment of occlusion and ideal arch form by using 0.017 x 0.025 stainless steel wire and 0.016 inch stainless steel round wire was used to allow tooth settling to facilitate masticatory function. Stage 8: Fixed retainer was given by flexible spiral wire and then the brackets and bands were removed.

### Post-treatment lateral cephalometric analysis (in degree)

The Sella Nasion point A angle was 84. The Sella Nasion point B angle, Point A Nasion point B angle, Frankfort mandibular plane angle and Frankfort mandibular incisor angle were 77.5, 6.5, 17 and 46 respectively (Figure 3).

### Provisional Diagnosis

Angel's class II malocclusion

### Differential Diagnosis

#### Bimaxillary protrusion

*Dr. Sultana Razia Khanam (MS Resident):* Bimaxillary protrusion is a state where maxilla and mandible are in balanced position in respect to cranial base. But the teeth especially the anterior teeth are forwardly placed leading to an appearance of prominence of soft tissues (lip).<sup>1,2</sup> In this case the molar canine and incisor relation are class I. Furthermore, in bimaxillary



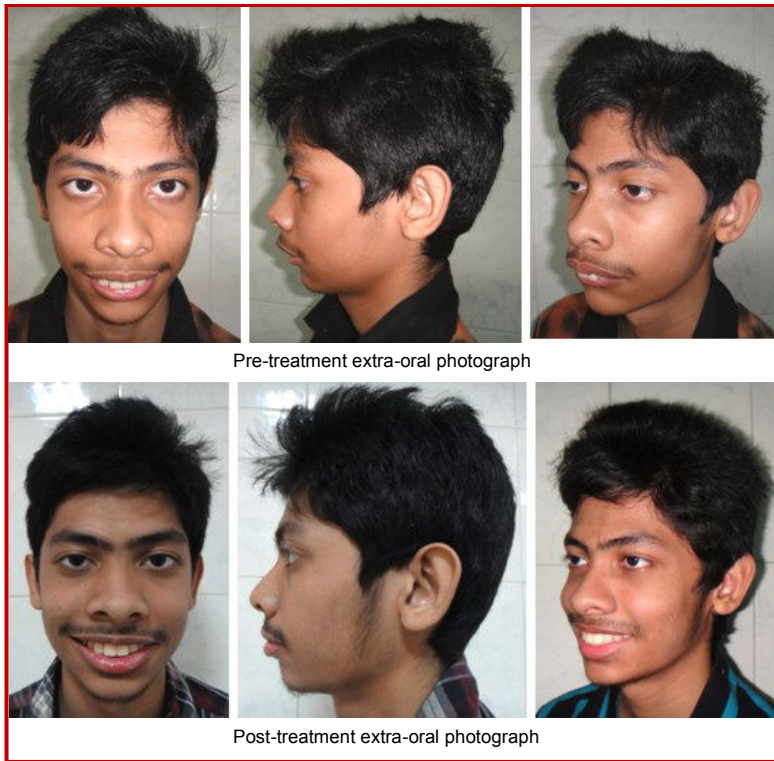


Figure 1: Represents pre- and post-treatment extraoral photographs revealed improvement of facial and soft tissue profile

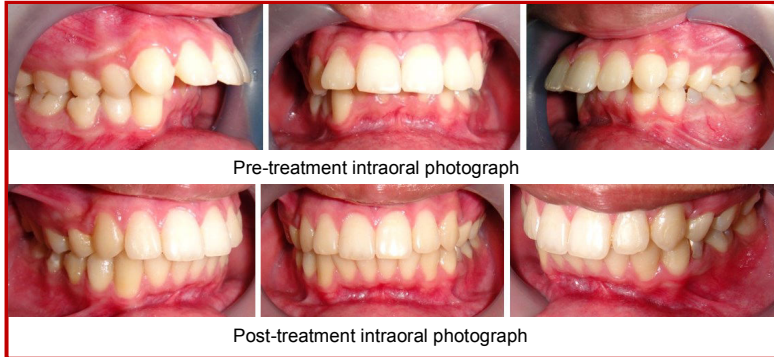


Figure 2: Represents pre- and post-treatment intra-oral photographs and revealed improvement of overjet, overbite and soft tissue

prognathism, the jaw bones (basal) remain forward in relation to to the cranial bone. The facial profile is convex and lips are usually everted.<sup>3,4</sup>

#### Class II division 2 malocclusion

Dr. Aktar: In these cases, the molar relation is class II. The maxillary central incisors are retroclined, the lateral incisors are usually proclined and rotated or overlap the upper central incisors.<sup>5,6</sup> There is natural dentoalveolar compensation for a class II skeletal pattern in order to decrease the overjet and increase the overbite.<sup>7,8</sup> The arch is squarish in appearance and the facial profile is straight.<sup>9,10</sup> The mandibular path of closure is backward and the lips are competent.<sup>11,12,13</sup>

#### Class III malocclusion

Dr. Mohammad Rafiqul Islam (MS Resident): Class III malocclusion is characterized by mandibular prognathism, anterior crossbite, negative overjet and underbite.<sup>14,15</sup> Furthermore, the mesiobuccal cusp of upper molars occludes not only in the mesiobuccal groove but distal to it.<sup>16,17</sup> It is more complicated when the lower anterior teeth are more prominent than that of the upper anterior teeth. Moreover, the patient very often represents with a ratrognathic maxillary bone and prognathic mandible.<sup>18,19</sup>

#### Dr. Aktar's Diagnosis

Class II malocclusion

#### Discussion

##### Discussion on treatment methods

Dr. Aktar: During treatment of class II malocclusion, it is necessary to perform proper diagnosis, treatment plan, anchorage planning to establish natural esthetic, occlusal and functional requirements of the patient. So, the treatment of this malocclusion is always challenging. In this case, non-surgical treatment was performed according to some previous studies.<sup>20,21</sup> Treatment was performed by using a combination of compensation mechanics and fixed orthodontic appliance. The treatment approach for the patient was camouflaged by the correction of the incisor relationship. Overall, facial, dental and the occlusal changes were achieved. Patient's aesthetic and functional efficiency was improved. The soft tissue lesion resolved automatically when the fixed orthodontic treatment was carried out. The overall results without any surgical intervention make the patient very much confident and happy.

##### Comparison with other methods

Dr. Mahmood Sajedeem (Associate Professor: There are some patients having skeletal class II malocclusion who are in the border line regarding treatment option. This patient's active growth was almost completed and therefore the treatment option by orthopedic or functional appliance was excluded. Other treatment options include the orthognathic surgery and dental camouflage.<sup>22,23</sup> Most of the patients want to avoid the surgical approach and accept dental camouflage. A previous study has indicated that the level of satisfaction of patients in camouflage treatment versus surgical orthodontic approach is almost similar.<sup>24</sup>

##### Comparison with previous studies and relapse

Dr. Aktar: It is considered that the age of the patient also affect the success of the treatment. A study by

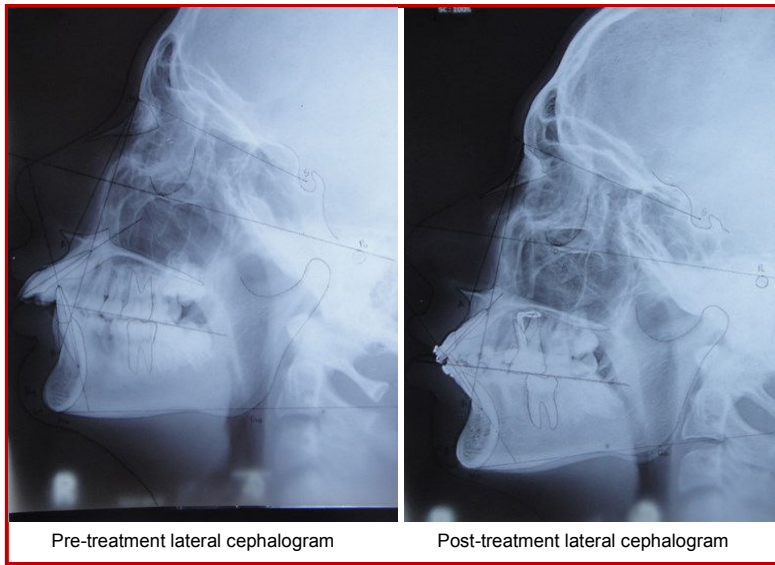


Figure 3: Represents pre- and post treatment cephalometric analysis

Pavoni et al. (2014)<sup>25</sup> reported that if the treatment of class II malocclusion can be started before pubertal growth spurt, there is a significant improvement of dentoalveolar changes, overjet and molar relationships. Treatment at puberty produces significant long-term improvement of sagittal skeletal relationships, which is due to the mandibular changes. The result is similar to the present study. A study by Danz et al. (2018)<sup>26</sup> indicated that 10% of the patients showed relapse and their amount of overbite increase was low. It can be considered that cases with deep bite, gingival contact and palatal impingement were more prevalent for the relapse. In this case, the relapse was not found within the 6 months.

### Follow-up

The patient was followed-up at an interval of every 6 months. Clinically, the improvement of the presenting complains like difficulties in bite were resolved. After completion of the treatment, it was noted that that the abnormal occlusion was changed to normal.

*Dr. Abdur Rashid Mondol (MS Residence):* What treatment options exist?

*Dr. Aktar:* Treatment methods include orthopedic, myofunctional and fixed appliance associated with class II intermaxillary elastic.<sup>27</sup>

*Dr. Abu Bakor Chowdhury (MS Resident):* What factors would you consider during finalize the treatment methods?

*Dr. Aktar:* Now-a-day's, patient demands for high quality treatment with minimum time and cost have

been increased. In the case of Class II malocclusion, several factors such as level of anterior-posterior discrepancy and age of the patient affect the treatment success. In this case, the surgical approach was avoided and accepts the dental camouflage due to similar treatment results.<sup>27</sup>

### Clinical Diagnosis

Excessive overjet and overbite

### Final Diagnosis

Class II division 1 malocclusion

### Conflict of Interest

Authors declare no conflict of interest.

### References

- Huang YP, Li WR. Correlation between objective and subjective evaluation of profile in bimaxillary protrusion patients after orthodontic treatment. *Angle Orthod.* 2015; 85: 690-98.
- Keim RG. The challenge of bimaxillary protrusion. *J Clin Orthod.* 2017; 51: 315-16.
- Oliveira MD, Silveira BL, Mattos CT, Marquezan M. Facial profile esthetic preferences: Perception in two Brazilian states. *Dental Press J Orthod.* 2015; 20: 88-95.
- Chen G, Teng F, Xu TM. Distalization of the maxillary and mandibular dentitions with mini-screw anchorage in a patient with moderate class I bimaxillary dentoalveolar protrusion. *Am J Orthod Dentofacial Orthop.* 2016; 149: 401-10.
- Uzuner FD, Aslan BI, Dinçer M. Dentskeletal morphology in adults with class I, class II division 1, or class II division 2 malocclusion with increased overbite. *Am J Orthod Dentofacial Orthop.* 2019; 156: 248-56.
- Katsavrias EG, Halazonetis DJ. Condyle and fossa shape in Class II and Class III skeletal patterns: A morphometric tomographic study. *Am J Orthod Dentofacial Orthop.* 2005; 128: 337-46.
- Maruo IT. Class II Division 2 subdivision left malocclusion associated with anterior deep overbite in an adult patient with temporomandibular disorder. *Dental Press J Orthod.* 2017; 22: 102-12.
- Baccetti T, Giuntini V, Vangelisti A, Darendeliler MA, Franchi L. Diagnostic performance of increased overjet in class II division 1 malocclusion and incisor trauma. *Prog Orthod.* 2010; 11: 145-50.

9. Perović T. The Influence of class II division malocclusions on the harmony of the human face profile. *Med Sci Monit.* 2017; 23: 5589-98.
  10. Cao L, Li J, Yang C, Hu B, Zhang X, Sun J. High-efficiency treatment with the use of traditional anchorage control for a patient with class II malocclusion and severe overjet. *Am J Orthod Dentofacial Orthop.* 2019; 155: 411-20.
  11. Alvarez-Solarte H, Sierra-Alzate V, Sánchez-Garzón J, Botero-Mariaca P. Palate shape and size and palatal rugae morphology of children with anterior open bite and normal vertical overbite. *J Forensic Odontostomatol.* 2018; 1: 34-43.
  12. McIntyre GT, Millett DT. Crown-root shape of the permanent maxillary central incisor. *Angle Orthod.* 2003; 73: 710-15.
  13. Goldstein BJ, Veitz-Keenan A. Extraction or non-extraction treatment for class II division 2 malocclusion? *Evid Based Dent.* 2018; 19: 88-89.
  14. Tseng LL, Chang CH, Roberts WE. Diagnosis and conservative treatment of skeletal class III malocclusion with anterior crossbite and asymmetric maxillary crowding. *Am J Orthod Dentofacial Orthop.* 2016; 149: 555-66.
  15. Al-Hummayani FM. Pseudo Class III malocclusion. *Saudi Med J.* 2016; 37: 450-56.
  16. Yamaguchi K, Kawanabe N, Tanaka E, Tanne K. Reduction of the hypocone of the maxillary first molar and Class III malocclusion. *Angle Orthod.* 2001; 71: 477-85.
  17. Nanda RS, Merrill RM. Cephalometric assessment of sagittal relationship between maxilla and mandible. *Am J Orthod Dentofacial Orthop.* 1994; 105: 328-44.
  18. Akan B, Veli I. Comparison of dental arch and mandibular-maxillary base widths between true and pseudo-Class III malocclusions. *Am J Orthod Dentofacial Orthop.* 2017; 151: 317-23.
  19. Krneta B, Zhurov A, Richmond S, Ovsenik M. Diagnosis of Class III malocclusion in 7- to 8-year-old children: A 3D evaluation. *Eur J Orthod.* 2015; 37: 379-85.
  20. Arora V, Sharma R, Chowdhary S. Comparative evaluation of treatment effects between two fixed functional appliances for correction of class II malocclusion: A single-center, randomized controlled trial. *Angle Orthod.* 2018; 88: 259-66.
  21. Janson G, Castello Branco N, Aliaga-Del Castillo A, Henriques JFC, de Morais JF. Soft tissue treatment changes with fixed functional appliances and with maxillary premolar extraction in class II division 1 malocclusion patients. *Eur J Orthod.* 2018; 40: 214-22.
  22. McSwiney TP, Millett DT, McIntyre GT, Barry MK, Cronin MS. Tooth size discrepancies in class division 1 and Class III malocclusion requiring surgical-orthodontic or orthodontic treatment. *J Orthod.* 2014; 41: 118-23.
  23. Pisek P, Manosudprasit M, Wangsrimongkol T, Keinprasit C, Wongpetch R. Treatment of a severe class II division 1 malocclusion combined with surgical miniscrew anchorage. *Am J Orthod Dentofacial Orthop.* 2019; 155: 572-83.
  24. Mihalik CA, Proffit WR, Phillips C. Long-term follow-up of class II adults treated with orthodontic camouflage: A comparison with orthodontic surgery outcomes. *Am J Orthod Dentofacial Orthop.* 2003; 123: 266-78.
  25. Pavoni C, Lombardo EC, Lione R, Faltin K Jr, McNamara JA Jr, Cozza P, Franchi L. Treatment timing for functional jaw orthopaedics followed by fixed appliances: A controlled long-term study. *Eur J Orthod.* 2018; 40: 430-36.
  26. Danz JC, Greuter C, Sifakakis I, Fayed M, Pandis N, Katsaros C. Stability and relapse after orthodontic treatment of deep bite cases: A long-term follow-up study. *Eur J Orthod.* 2014; 36: 522-30.
  27. McNamara JA Jr. Components of class II malocclusion in children 8-10 years of age. *Angle Orthod.* 1981; 51: 177-202.
-