

Orthodontic Management of Pseudo Class III Malocclusion: A Case Report

• Nabin Kumar Chaudhary¹ • Jamal Giri² • Prabhat Ranjan Pokharel²

Submitted 6 April 2022

Accepted 18 September 2022

Published 2 November 2022



Nabin Kumar Chaudhary

drnabin39@gmail.com



<https://orcid.org/0000-0001-6053-4854>

¹ Dental Department, Hetauda Hospital, Hetauda, Nepal.

² Department of Orthodontics, BP Koirala Institute of Health Sciences, Dharan, Nepal.

Citation

“Chaudhary NK, Giri J, Pokharel PR. Orthodontic management of pseudo class III malocclusion: a case report. *JBPKIHS*. 2022;5(1):48-52. ”



<https://doi.org/10.3126/jbpkihs.v5i1.44256>



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Abstract

Pseudo class III malocclusion is due to immature contact of incisors resulting in a forward shift of mandible. A 13-year-old male patient presented with the complaint of inability to bite properly with pseudo skeletal class III malocclusion, functional shift, and reverse overjet which was treated with fixed orthodontic treatment. The total treatment duration was 21 months in which correction of the discrepancy between centric occlusion and centric relation and improvement of the smile of the patient was achieved. Early and timely diagnosis of pseudo class III malocclusion will lead to a successful outcome with fixed orthodontic therapy.

Keywords: Anterior crossbite; Functional shift; Pseudo class III malocclusion.

Declarations

Ethics approval and consent to participate: Not applicable

Consent for publication: Informed consent was obtained from the patient for the publication.

Availability of data and materials: Data will be made available upon request.

Competing interest: None

Funding: None

Authors' contributions: NKC: diagnosis, management of case, preparation of manuscript. JG: diagnosis, management of case. PRP: diagnosis, management of case. All authors read and approved the final manuscript.

Acknowledgement: None

Pseudo class III malocclusion is a false class III malocclusion that occurs as a result of forward functional mandibular displacement. This occurs as a premature contact between maxillary and mandibular incisors that prevents posterior occlusion and thus the mandible is displaced anteriorly to get a maximum intercuspation of the posterior teeth [1]. When guiding a patient into a centric relation, they usually show an end-to-end incisor relationship with a posterior open bite while in the centric occlusion forward functional mandibular shift occurs [2]. The skeletal class III profile remains concave in postural rest position and habitual occlusion whereas the pseudo class III profile is usually straight but becomes concave as the mandible shifts forward into the habitual occlusion position [3]. Treatment of pseudo class III malocclusion should be done as soon as it is detected [4], as it helps in the favorable growth of the maxilla and mandible [5]. The presented case shows pseudo class III malocclusion with the inability to bite properly which resulted in difficulty in chewing food.

CASE

A 13-year-old male patient presented with the chief complaint of “inability to bite properly”. There was no relevant past medical, dental, or family history. No past intervention was carried out on the patient for the treatment of malocclusion. On clinical examination, the profile of the patient was straight with anterior divergence (**Fig. 1a**). On intra-oral examination, the number of teeth present clinically was 28 with unerupted all third molars; crossbite with respect to 11, 12, 21, and 22. The

shape of the maxillary arch was ovoid, asymmetrical, and presence of crowding, mesiolabial rotation of 21, palatally placed 12, and mesiolabial rotation of 13. The shape of the mandibular arch was ovoid, asymmetrical, with slight spacing, and mesiolingual rotation of 35 and 45. Molar Relation was super class I bilaterally with overjet of -1 mm and overbite of 3 mm (**Fig. 1b**). The upper dental midline was shifted to the right by 1 mm; the lower dental midline was shifted to the left by 1 mm. On centric occlusion, there was a forward shift of the mandible with anterior crossbite (**Fig. 1b**) while in centric relation patient had edge to edge bite (**Fig. 1c**). On model analysis, the Bolton's ratio showed anterior mandibular excess of 2.5 mm.

On smile analysis, lip line was average, non-consonant smile arc, straight upper lip curvature, cupid smile style, and square upper central incisor with a golden standard of 84.2%. On radiographic examination, the orthopantomogram (OPG) showed Demirjian stage G of 37, 47, 44, 45, 35, intra-oral periapical radiograph with respect to 11 and 21 showed no pathological change and the lateral cephalogram showed Cervical Vertebrae Maturation (CVM) stage 4 (**Fig. 2b**). The upper incisor were mildly proclined and normally placed (upper incisor to NA = $23^\circ/4\text{mm}$) while lower incisors were retroclined and backwardly placed (lower incisors to NB = $21^\circ/3\text{mm}$). The skeletal diagnosis was skeletal class III (ANB = -3°), with retrognathic maxilla (SNA = 78°), normal mandible (81°), normal growth pattern (SN-GoGn = 32°), and forward shift of the mandible i.e. pseudo class III malocclusion. The dental diagnosis was Angle's class III malocclusion, soft tissue diagnosis

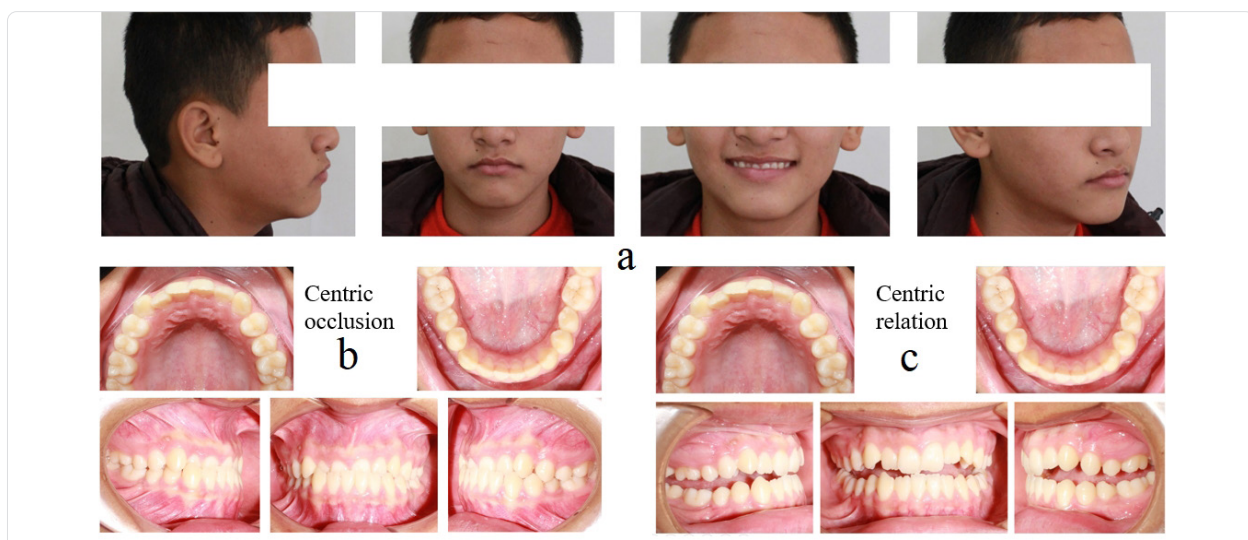


Figure 1: a) Pre-treatment extraoral photographs b) Pre-treatment intraoral photographs in centric occlusion c) Pre-treatment intraoral photographs in centric relation

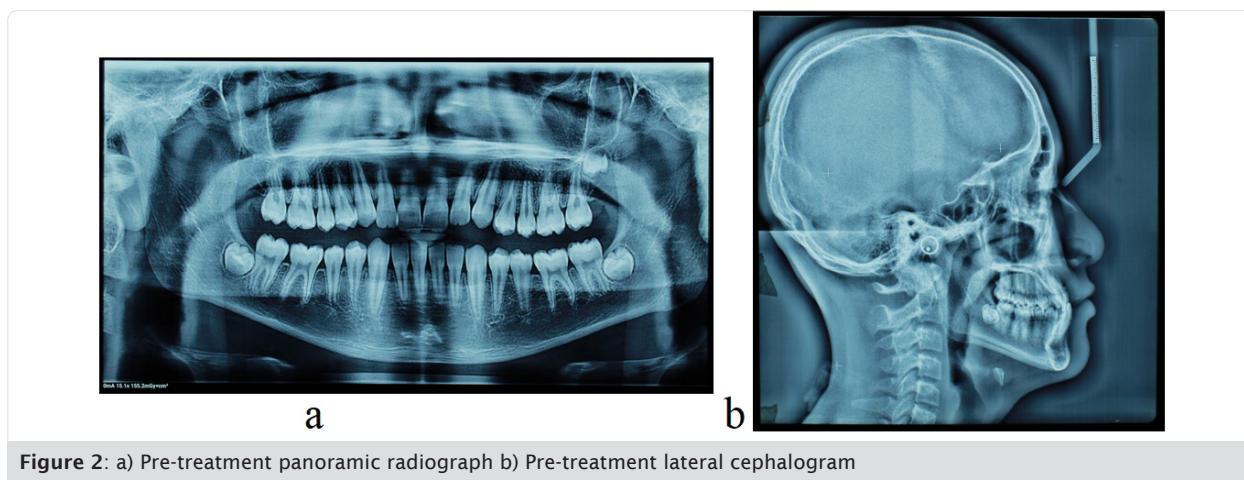


Figure 2: a) Pre-treatment panoramic radiograph b) Pre-treatment lateral cephalogram

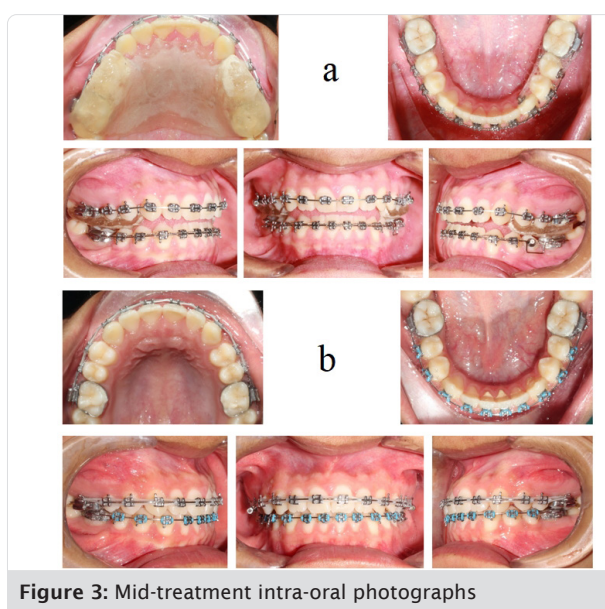


Figure 3: Mid-treatment intra-oral photographs

was protrusive upper and lower lips (E line to upper and lower lips were placed at the distance of -2.5 mm and 0 mm respectively) (Table 1). Since the patient has already crossed the peak adolescent growth (CVM stage 4) and the malocclusion was not severe, orthodontic

camouflage was planned.

Fixed orthodontic treatment was started with the MBT bracket 0.022" slot. The levelling and alignment begun with 0.014" NiTi (Nickel Titanium), followed by 0.016" NiTi and 0.017"x0.025" NiTi in both upper and lower arch. The posterior bite plane in the maxillary arch was given to raise the anterior teeth (Fig. 3a). The posterior bite plane was used for one month and was discontinued after bite jumping was achieved. 0.018" SS (stainless steel) was used in the lower arch as base archwire to apply a couple force for derotation of 35 and a couple force was applied from 33 and 36. Space closure was done in 0.019"x0.025" SS with the help of the E-chain (Fig. 3b). Class III elastic (1/4" diameter and 3.5 oz force) was used for protraction of the upper posterior teeth. Proximal stripping was done in the lower arch as there was an anterior mandibular excess. The panoramic radiograph showed roots parallel to each other at the end of treatment (Fig. 4a). Individual torque was applied for 11 to achieve a proper root inclination. Posterior box elastics (3/16" diameter and 4.5 oz force) were used for settling of the posterior teeth. The circumferential supracrestal fibrotomy (CSF) was

Table 1: Comparison of pre and post treatment cephalometric values.

Parameters	Pre-treatment	Post-treatment	Difference
SNA	78°	79°	+1°
SNB	81°	80°	-1°
ANB	-3°	-1°	+2°
SN-GoGn	32°	30°	-2°
Upper incisor to NA	23° / 4 mm	30° / 7.2 mm	+7° / +3.2 mm
Lower incisor to NB	21° / 3 mm	22° / 2.4 mm	+1° / -0.6 mm
E line to upper lip	-2.5 mm	-2.4 mm	+0.1 mm
E line to lower lip	0 mm	0 mm	0 mm

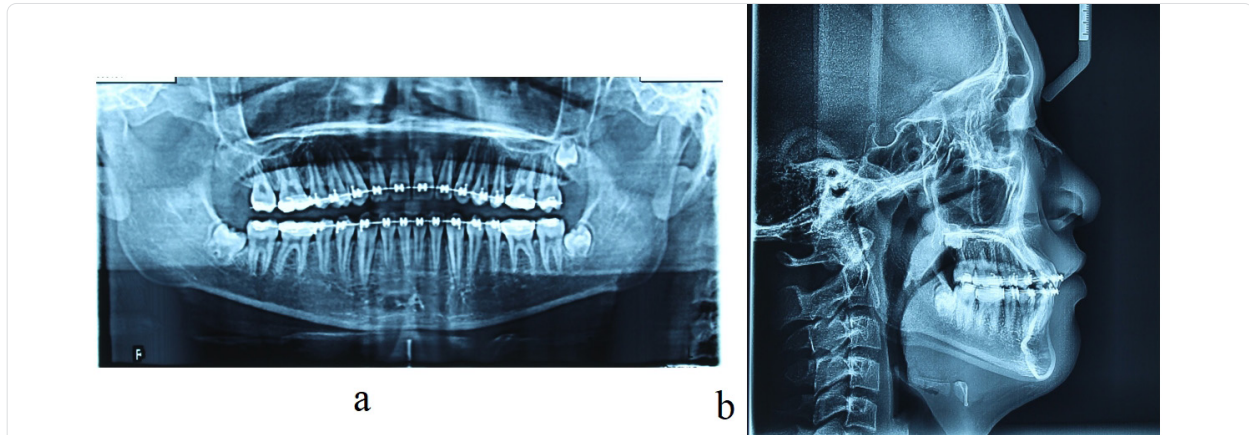


Figure 4: a) Panoramic radiograph prior to debond b) Lateral cephalogram prior to debond

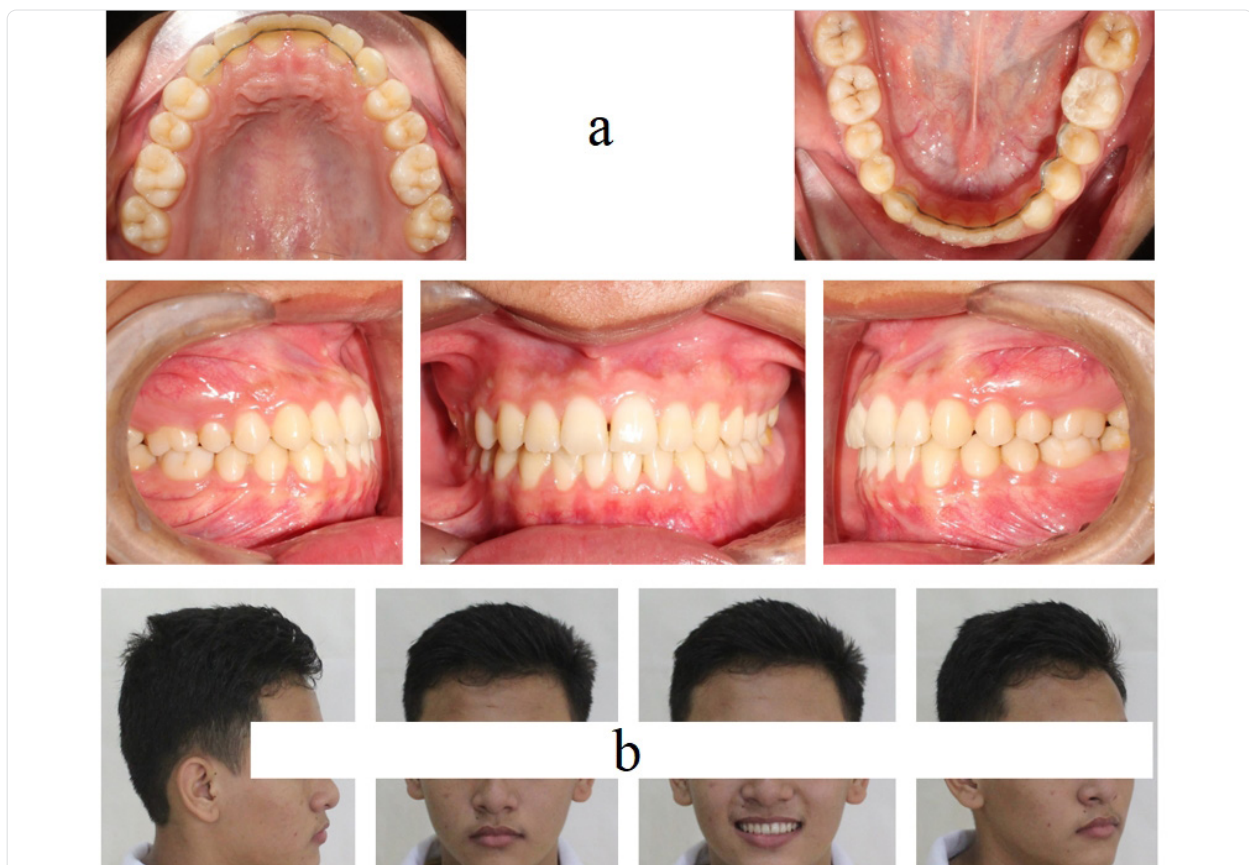


Figure 5: a) Post treatment intraoral photographs b) Post treatment extraoral photographs

done with respect to 35 one week before the debond. The lateral cephalogram post treatment showed an acceptable incisal relationship (**Fig. 4b**). The lingual bonded retainer was used as a retainer in both the upper and lower arch after debonding. The correction of functional shift and anterior crossbite was achieved (**Fig. 5a**). In the end, there was class I molar and class I canine relation on both sides. The total duration of

treatment was 21 months. The smile of the patient had been improved (**Fig. 5b**), however, there was a small black triangle in between the upper central incisors. During the course of treatment, the patient experienced frequent breakage of brackets and inadequate torque for 11 which was corrected by applying additional torque to the archwire.

DISCUSSION

This case report describes a proper diagnosis of pseudo Class III malocclusion with its successful management through the fixed orthodontics. Pseudo class III malocclusion has class I or mild class III skeletal relationship while the mandible appears morphologically normal which is true for this case. Anterior crossbite and negative overjet are constantly present in this type of malocclusion [6]. The complications associated with anterior crossbite include [7], gingival recession of the lower incisors, incisor wear, and worsening of the growth pattern. The possible etiological factors for this malocclusion include ectopic eruption of maxillary central incisors, premature loss of deciduous molars, anomalies in tongue position, neuromuscular problems, naso-respiratory or airway problems, minor transverse maxillary discrepancy, etc [8].

The treatment of pseudo class III malocclusion can be done through the use of a removable appliance [7], a functional orthopedic appliance [6], and a fixed orthodontic appliance [2]. Al-Hummayani FM performed the treatment of pseudo class III malocclusion in two-phase in which the first phase was treated by removable modified Hawley appliance with an inverted labial bow and the second phase treatment was done by the fixed appliance [7]. The objective of the treatment was to create a positive overjet and overbite with good alignment of teeth which was accomplished in 11 months. Giancotti A et al. [6] used a functional bionator appliance for the correction of mesially placed mandible encouraging favorable mandibular growth. The advantages of this approach include prevention of unfavourable growth especially mandibular protrusion, prevention of habits such as bruxism, elimination of

traumatic occlusion and anterior crossbite, elimination of the need for using bands and brackets reducing its wear duration. However, disadvantages include difficulty in finishing and patient cooperation [6]. Reyes A et al. described the correction of pseudo class III malocclusion through the use of the maxillary expansion and the 2x4 appliance where the patient was first submitted to a rapid maxillary expansion followed by the 2x4 appliance in the maxillary arch associated with a removable bite plane in the mandibular arch [2]. The space gained with maxillary expansion and maxillary incisors protrusion helped in the eruption of maxillary canines and anterior crossbite correction.

The presented case was skeletal class III malocclusion with a forward mandibular shift. The fixed orthodontics was planned for this case with the objective of correcting centric relation - centric occlusion discrepancy which was achieved at the end of treatment. CSF was done with respect to 35 as this has shown to be more successful in reducing relapse of rotation [9]. However, the developed black triangle in between upper central incisors was not corrected with a high probability of papillary growth as the patient was still in the adolescent phase of life [10]. The patient was satisfied with an improved smile and in being able to bite properly.

CONCLUSION

The diagnosis of pseudo class III malocclusion is always challenging. A proper diagnosis could directly influence the treatment approach required to achieve the treatment objectives. The correctly diagnosed pseudo class III malocclusion can be successfully treated with a fixed appliance therapy.

References

1. Rabie AB, Gu Y. Diagnostic criteria for pseudo-Class III malocclusion. *Am J Orthod Dentofacial Orthop.* 2000;117:1-9. DOI: 10.1016/s0889-5406(00)70241-1
2. Reyes A, Serret L, Peguero M, Tanaka O. Diagnosis and treatment of pseudo-class III malocclusion. *Case Rep Dent.* 2014;2014:652936. DOI: 10.1155/2014/652936
3. Kumar SA, Shetty KS, Prakash AT. Pseudo-class III: diagnosis and simplistic treatment. *J Ind Orthod Soc.* 2011;45:198-201. DOI: 10.5005/jp-journals-10021-1035
4. Turley PK. Treatment of the class III malocclusion with maxillary expansion and protraction. *Semin Orthod.* 2007;13:143-57. DOI: 10.1053/j.sodo.2007.05.005
5. Zere E, Chaudhari PK, Sharan J, Dhingra K, Tiwari N. Developing class III malocclusions: challenges and solutions. *Clin Cosmet Investig Dent.* 2018;10:99-116. DOI: 10.2147/CCIDE.S134303
6. Giancotti A, Maselli A, Mampieri G, Spano E. Pseudo-class III malocclusion treatment with Balters' Bionator. *J Orthod.* 2003;30:203-15. DOI: 10.1093/ortho/30.3.203
7. Al-Hummayani FM. Pseudo class III malocclusion. *Saudi Med J.* 2016;37:450-6. DOI: 10.15537/smj.2016.4.13685
8. Nakasima A, Ichinose M, Nakata S, Takahama Y. Hereditary factors in the craniofacial morphology of Angle's class II and class III malocclusions. *Am J Orthod.* 1982;82:150-6. DOI: 10.1016/0002-9416(82)90493-6
9. Edwards JG. A long-term prospective evaluation of the circumferential supracrestal fiberotomy in alleviating orthodontic relapse. *Am J Orthod Dentofacial Orthop.* 1988;93:380-7. DOI: 10.1016/0889-5406(88)90096-0
10. Chen MC, Chan CP, Tu YK, Liao YF, Ku YC, Kwong LK, et al. Factors influencing the length of the interproximal dental papilla between maxillary anterior teeth. *J Dent Sci.* 2009;4:103-9. DOI: 10.1016/S1991-7902(09)60015-5