Case Report

Submitted: Feb 01, 2021
Accepted: Nov 24, 2021
Published: Aug 3, 2022

Orthodontic Treatment with Removal of One Mandibular Incisor: A Case Report

Dr. Nabin Kumar Chaudhary,[1] Dr. Jamal Giri,[2] Dr. Rajesh Gyawali,[3] Dr. Prabhat Ranjan Pokharel[4]

[1]Dental Department, Hetauda Hospital, Hetauda, Nepal

[2-4]Department of Orthodontics, B.P. Koirala Institute of Health Sciences, Dharan, Nepal

Correspondence :

Dr. Nabin Kumar Chaudhary. Email: cnabin39@gmail.com

ABSTRACT

Mandibular incisor extraction is performed infrequently ranging from less than 1.1%- 6% of all patients undergoing orthodontic treatment. The extraction of lower incisor in certain cases allows orthodontist to improve occlusion and dental aesthetics with minimum orthodontic action. This article presents case reports of three patients visiting Orthodontic Department, who were treated with lower incisor extraction. In all three cases reported, single lower incisor extraction enabled to produce functional and aesthetic results with minimal orthodontic manipulation. If carefully planned and executed in the specific situation, lower incisor extraction can meet the specific designed objectives in minimal time framework.

Keywords: Bolton's discrepancy; lower incisor extraction; orthodontic treatment.

INTRODUCTION

Permanent first premolars are routinely extracted in orthodontics to relieve crowding due to its location in the centre of arch.[1] The extraction of lower incisor in certain cases allows the orthodontist to improve occlusion and dental aesthetics with minimum orthodontic action.[2] The indications[3,4] include class I malocclusion with normal maxillary dentition, class I malocclusion with good buccal interdigitation, severe lower anterior crowding with lack of space for almost one central incisor, class I malocclusion with anterior cross-bite due to lower anterior crowding and protrusion, and class I malocclusion with severe anterior tooth-size discrepancy.

CASE I

A 16-year-old male patient came to the orthodontic department, college of dental surgery (CoDS), B.P. Koirala institute of Health Sciences (BPKIHS), Dharan, Sunsari, Nepal with the chief complaint of irregular teeth in the lower front region of jaw. On extraoral examination, profile of patient was convex, nasolabial angle was normal and lips were competent (Figure 1). On intraoral examination, there was distolabial rotation of 11 (all teeth classified according to two-digit tooth numbering system), mesiopalatal rotation of 12, and 21 of maxillary arch (Figure 2). On mandibular arch, 42 was lingually placed, mesiolabial rotation of 41, distolabial rotation of 32, and mesiolingual rotation of 33. Molar relation was bilaterally super class I, canine and incisor relation was class I. Overjet and overbite were normal. Facial midline coincided with upper dental midline and lower dental midline shifted to right by 1 mm. On smile analysis, lip line was suggestive of average smile, smile arc was consonant with normal shape of upper central incisor.

Citation
Chaudhary NK, Giri J, Gyawali R, Pokharel PR. Orthodontic treatment with removal of one mandibular incisor: A case report. J Nepal Dent Assoc. 2022 Jul-Dec;22(35):118-22.

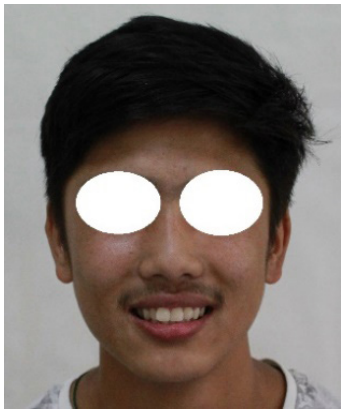

Figure 1: Extraoral photograph before orthodontic treatment.

Figure 2: Intraoral photograph before orthodontic treatment.

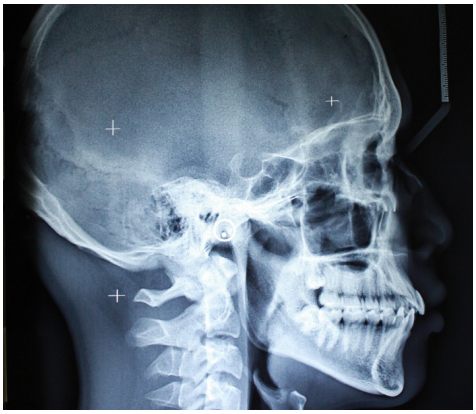

Figure 3: Lateral cephalogram before orthodontic treatment.

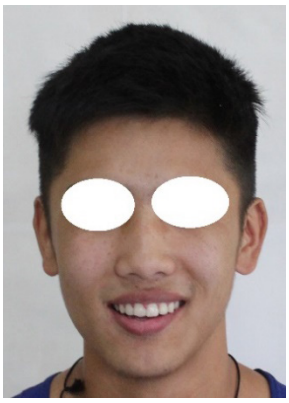

Figure 4: Smile of patient post orthodontic treatment.

Panoramic radiograph showed the presence of all permanent teeth. The lateral cephalogram showed normal maxilla and mandible with SNA and SNB 80˚ and 79˚, vertical growth pattern 28˚ with mild proclination of upper and lower incisors (Figure 3). Molar relation showed Angle's class III malocclusion. Bolton's analysis showed mandibular excess of amount 4 mm.

The treatment goal was to correct the lower incisor crowding and maintenance of buccal occlusion. Since buccal occlusion was good, 42 was out of arch with mandibular excess, orthodontic treatment was planned with extraction of 42.

Treatment was done with McLaughlin, Bennett, and Trevisi (MBT) prescription of 0.022" slot brackets. The comparison of smile of patient before and after orthodontic treatment showed improved smile (Figure 4). Crowding of maxillary and mandibular arches had improved. At the end treatment, class I molar and incisor relation was achieved, and retention was done through Hawley's retainer both in the upper and lower arch. The total treatment duration for this patient was about 14 months.

CASE II

A 15-year-old patient came to the orthodontic department, CoDS-BPKIHS with chief complaint of irregularly placed teeth in both upper and lower front region of jaw. Profile of patient was convex with normal nasolabial angle and competent lip. Smile analysis showed average lip line with non-consonant smile arc (Figure 5). The path of closure was backward due to retroclined upper central incisors. The upper arch showed retroclined 11 and 21; mesiolabial rotation of 13, 12, 22, and 23. The mandibular arch showed anterior crowding with labially placed 41, lingually placed 42, distolingual rotation of 31, 32 (Figure 6). Molar relation was bilaterally class I, with normal overjet and deepbite.

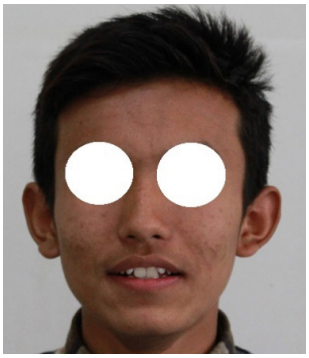

Figure 5: Extraoral photograph before orthodontic treatment.

Figure 6: Intraoral photograph before orthodontic treatment

Figure 7: Intraoral photograph after orthodontic treatment

Figure 8: Extraoral photograph after orthodontic treatment

Panoramic radiograph showed presence of all permanent teeth. Lateral cephalogram showed skeletal class I with ANB 3°. The interincisal angle was increased to 140° due to retroclined upper incisors.

Bolton's analysis showed anterior mandibular excess of about 5.7 mm. The treatment was aimed to correct crowding both in upper and lower arches. Orthodontic treatment was planned with extraction of 42. Appliance used was MBT prescription of 0.022" bracket. Crowding of arches were improved (Figure 7). The smile of patient had improved from non-consonant to consonant smile (Figure 8). At the end of treatment, class I molar and incisor relation was maintained, and vacuum formed retainer was placed as part of retention plan.

CASE III

A 21-year-old male patient came to the orthodontic department, CoDS-BPKIHS with the chief complaint of irregular teeth in the upper and lower front region of jaw. Smile analysis showed average lip line with consonant smile arc (Figure 9). Maxillary arch examination showed mild crowding. Mandibular arch showed severe anterior crowding with labially placed 31, 41 and lingually placed 32, 42 (Figure 10). Molar relation was super class I bilaterally. Panoramic radiograph showed presence of all permanent teeth. The 16 was root canal treated without any obvious pathology. The skeletal bases showed skeletal class I with ANB 4° (Figure 11), horizontal growth pattern FMA 21° with mild proclination of upper and lower incisors. The Bolton's discrepancy showed mandibular anterior excess with amount 3.5mm.

Although it is not favourable to extract single incisor in horizontal growth pattern as it could result in deepening of bite,[3] but since the patient had retrusive upper and lower lips, with mandibular anterior excess, extraction of 42 was planned. The treatment was done through the MBT prescription of 0.022" bracket. The post orthodontic treatment

Figure 9: Extraoral photograph before orthodontic treatment.

Figure 10: Intraoral photograph before orthodontic treatment.

Figure 11: Lateral cephalogram before orthodontic treatment.

Figure 12: Extraoral photograph after orthodontic treatment.

showed correction of crowding in the upper and lower arch and the improvement of smile (Figure 12). At the end of treatment, class I molar and incisor relation was achieved, and fixed retainer was placed from canine to canine as part of retention plan.

DISCUSSION

Mandibular incisor extraction is performed infrequently ranging from less than 1.1% to 6% of all patients undergoing orthodontic treatment.[5] This might be due to unaesthetic result because of lack of concordance of the maxillary and mandibular midlines.[6] Clinicians should be careful to avoid poor outcomes such as gingival recession, open interproximal gingival embrasures, increased overjet, and overbite.[6] The advantage of lower incisor extraction is reduced treatment time and maintenance of buccal occlusion.[7] Stability of result with incisor extraction has been found better than premolar extraction.[8] The disadvantage of extraction of lower incisor extraction include lower midline deviation, formation of black triangle due to papillary defect between lower incisors.[9] In all three cases, single lower incisor extraction enabled to produce functional and aesthetic results with minimal orthodontic manipulation. If carefully planned and executed in the specific situation, lower incisor extraction can meet the specific designed objectives in minimal time framework. If one of the lower incisor is ectopically placed, with anterior tooth material excess and good buccal occlusion, lower incisor extraction can be an effective means for orthodontic treatment.

ACKNOWLEDGEMENT

The authors would like to express their deepest gratitude to the patients at the Department of Orthodontics, College of Dental Surgery, BPKIHS, Dharan, Sunsari, Nepal for their participation and giving their consent for publication.

Conflict of interest: None.

REFERENCES

1. Araújo TMd, Caldas LD. Tooth extractions in Orthodontics: First or second premolars? Dental Press J Orthod. 2019;24(3):88-98. [PubMed | Full Text | DOI]
2. Canut JA. Mandibular incisor extraction: Indications and long-term evaluation. Eur J Orthod. 1996;18(5):485-9. [PubMed | Full Text | DOI]
3. Bahreman AA. Lower incisor extraction in orthodontic treatment. Am J Orthod. 1977;72(5):560-7. [PubMed | Full Text | DOI]
4. Kumaresan J, Kumar TS, Kumar S. Skeletal class III camouflage by mandibular incisor extraction: A case report. APOS Trends Orthod. 2014;4(2):40-4. [Full Text]
5. Hwang S, Kim I, Jang W, Choi YJ, Chung CJ, Kim KH. A 15-year follow up of an orthodontic treatment including a lower incisor extraction and keeping the maxillary canine-premolar transposition. Angle Orthod. 2019;89(5):812-26. [PubMed | Full Text | DOI]
6. Zhylich D, Suri S. Mandibular incisor extraction: A systematic review of an uncommon extraction choice in orthodontic treatment. J Orthod. 2011;38(3):185-95. [PubMed | Full Text | DOI]
7. Kokich VG, Shapiro PA. Lower incisor extraction in orthodontic treatment. Four clinical reports. Angle Orthod. 1984;54(2):139-53. [PubMed | Full Text | DOI]
8. Riedel RA, Little RM, Bui TD. Mandibular incisor extraction--Postretention evaluation of stability and relapse. Angle Orthod. 1992;62(2):103-16. [PubMed | Full Text | DOI]
9. Raju DS, Veereshi AS, Naidu DL, Raju BHVR, Goel M, Maheshwari A. Therapeutic extraction of lower incisor for orthodontic treatment. J Contemp Dent Pract. 2012;13(4):574-7. [PubMed | Full Text | DOI]