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Orthodontic Management of a Bilaterally Missing Lower Incisors with Moderate Upper Anterior Crowding.

Adeyemi TE[a], Otuyemi OD[b]

Abstract

Background: Hypodontia is also known as tooth agenesis and it refers to a situation whereby one or more teeth are absent due to lack of formation of one or more teeth. This shows how a case of bilaterally missing mandibular lateral incisors was managed.

Methods: The case was managed with the use of fixed orthodontic appliance therapy and crown reshaping.

Results: The maxillary anterior crowding was resolved; the space created by the missing mandibular lateral incisors; over malocclusion traits identified were resolved satisfactorily.

Conclusion:

The malocclusion was successfully treated with upper and lower fixed orthodontic appliance therapy.

An aesthetic ad stable occlusion was achieved at the completion of treatment. Hawley's retainers were used to ensure stability of treatment outcome.

Keywords: Hypodontia, Lateral incisors, mandibular incisors, Crowding, Crown conversion

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ORIGINAL ARTICLE

Introduction

Hypodontia is also known as tooth agenesis and it refers to a situation whereby one or more teeth are absent due to lack of formation of one or more teeth. It is the most common craniofacial malformation in humans which can occur as part of a known genetic syndrome or as a non-syndromic isolated trait.[1]

The mandibular second premolars, maxillary lateral incisors, followed by the mandibular incisors and maxillary premolars are the most affected teeth.[2]

Hypodontia may affect the speech, aesthetics, chewing and balance of the occlusion due to unfavorable occlusal contacts as a result of the supra-eruption of the opposing teeth or how the teeth adjacent to it is inclined, thereby affecting the quality of life too.[3,4]

A number of treatment options are available for hypodontia which includes: space closure with the repositioning of the canines mesially, followed by teeth recontouring; or space opening followed by prosthetic replacement of the missing lateral incisor.[5,6]

This manuscript discusses the treatment options available for hypodontia and reports the orthodontic treatment given to a 33-year-old female with bilateral hypodontia of the mandibular lateral incisors.

Case report

A 33year-old female with chief complaint of not liking the arrangement of her teeth. She was very

concerned about the overlapping of the upper front teeth and the spaces in the lower front jaw.

She was willing to undergo treatment to correct the arrangement of her upper teeth and to close the spaces in the lower teeth in order to improve her appearance and self-esteem. She had no known systemic disease. Extraoral evaluation revealed a concave profile with facial symmetry and normal vertical proportions. Lips were potentially competent with a Jacksons lip pattern of 2 over 1; intraoral evaluation revealed a bilaterally missing lower lateral incisors with other complement of teeth present in both jaws from the central incisors to the third molar in all quadrants. The molar relationships were Angle's Class I on both sides with skeletal pattern 2 complicated by: bilaterally missing mandibular lateral incisors, increased overjet of 8mm, deep and traumatic overbite, disto-labial rotation of maxillary central incisors; moderate upper anterior crowding; lower midline deviation to the left by 1mm, mild lower anterior segment spacing, bilaterally impacted mandibular third molars. (Figures 1 and 2)



Figure 1: Pre treatment photographs

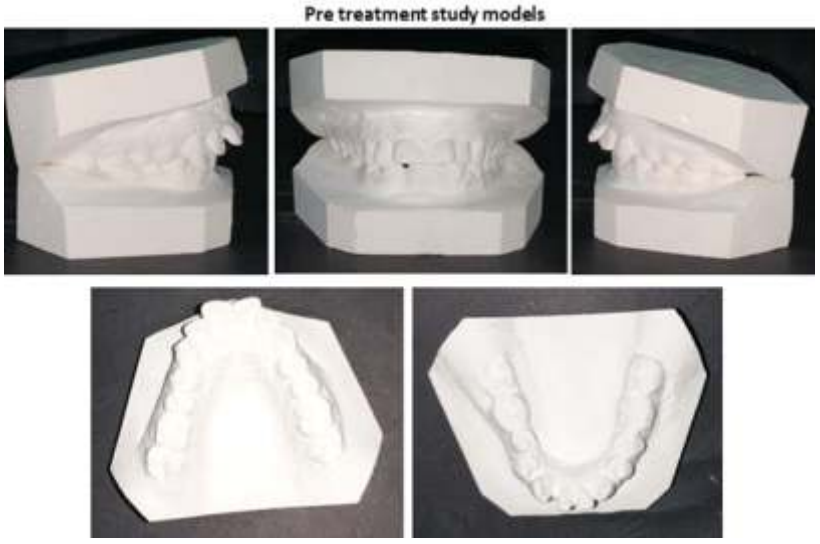


Figure 2: Pre treatment study models

The panoramic radiograph showed the presence of all the teeth except the mandibular lateral incisors; it also shows impacted third molars in all quadrants; cephalometric analysis showed values as presented in Figure 3 and Table 1.

Treatment objectives: The objectives of treatment in this patients were to: To level and align upper and lower arches, correct overbite, correct midline deviation, correct overjet, close spaces, crown conversion of the mandibular canines to laterals and mandibular first premolars to canines bilaterally, Surgically extract impacted molars, maintain angle's class I relationship and retention of the achieved treatment outcomes.

Treatment options: Based on the complaints of the patient and evidence from available literature, the following options were considered possible:

1. Interdisciplinary management with restorative dentist for crown conversion of the mandibular canines to laterals and mandibular first premolars to canines bilaterally together with Upper and lower fixed appliance with

extractions of the maxillary first premolars.

2. Interdisciplinary management with restorative dentist to replace missing lateral incisors bilaterally together with Upper and lower fixed appliance with extractions of the maxillary first premolars.

Treatment plan

Interdisciplinary management with a restorative dentist for crown conversion of the mandibular canines to laterals and mandibular first premolars to canines bilaterally, with Upper and lower fixed appliance with extractions of the maxillary first premolars was adopted for the patient for the correction of her malocclusion.

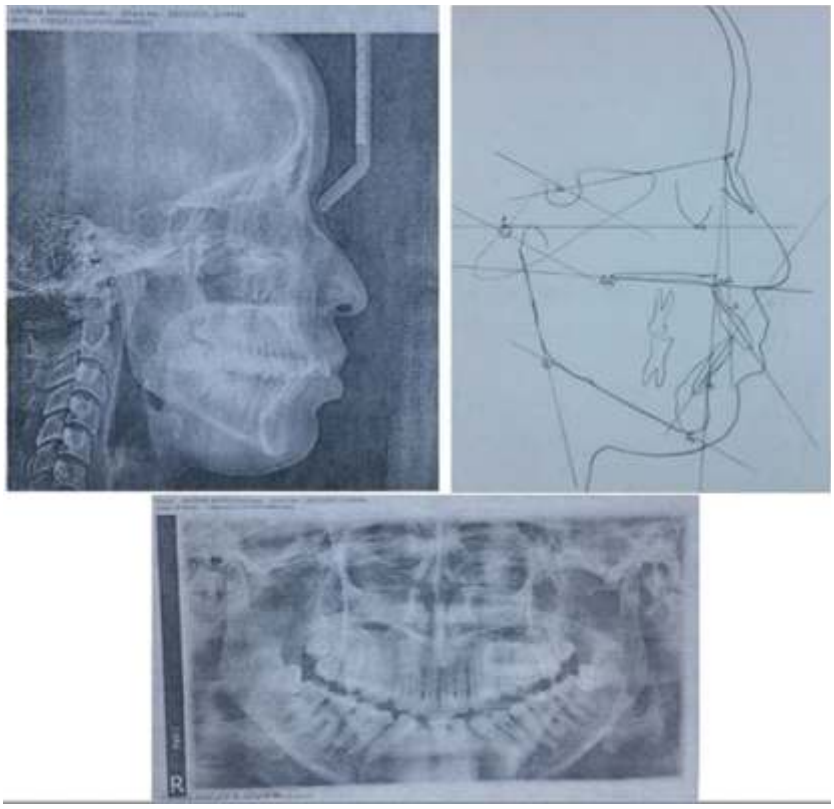


Figure 3: Pre treatment radiographs

Table 1: Pre treatment Cephalometric Analysis

Parameter	Obtained values	Normal Value	Analysis
SNA	80°	85.3 ±2.7°	Decreased
SNB	74,5°	82.5±3.5 °	Decreased
ANB	5.5°	2-4 °	Increased
SKP	2		
U1-MXP	128°	119-127 °	Increased
L1-MDP	96.5°	96-104 °	Normal
U1-L1	113°	108-116 °	Normal
MMPA	23°		
FMPA	26.5°	24-26 °	
LFHP	54.5%		

Treatment progression: Treatment began with oral hygiene prophylaxis and extraction of impacted third molars in all quadrants and maxillary first premolars. This was followed two weeks later by cementing molar bands on all the first molar teeth, using glass ionomer cement and bonding Roth 022 prescription

brackets, using orthodontic composite. Lacebacks were put in all quadrants from canine to first molar; Levelling and alignment was achieved by the sequential use of nickel titanium wires (014, 016, 018, 020 inches) and stainless steel wires (020, 0.016 X 0.025, 0.019 X 0.025 inches).

The intra-arch spaces were closed by the use of elastic chains on 019 by 025 inches stainless steel wire; the midline deviation was corrected by use of Class II elastics on the left and class III elastics on the right side. (Figure 4)

Conversion of mandibular canine to lateral incisor and premolar to canine, bilaterally done by the restorative dentist and the brackets repositioned thereafter.

Active treatment took 15 months. Hawley's retainers were used to maintain the positions of the teeth after treatment.

Treatment progress



Figure 4: Treatment progress photographs



Figure 5: Post treatment photographs



Figure 6: Post treatment Hawley's retainers



Figure 7: Post treatment study models

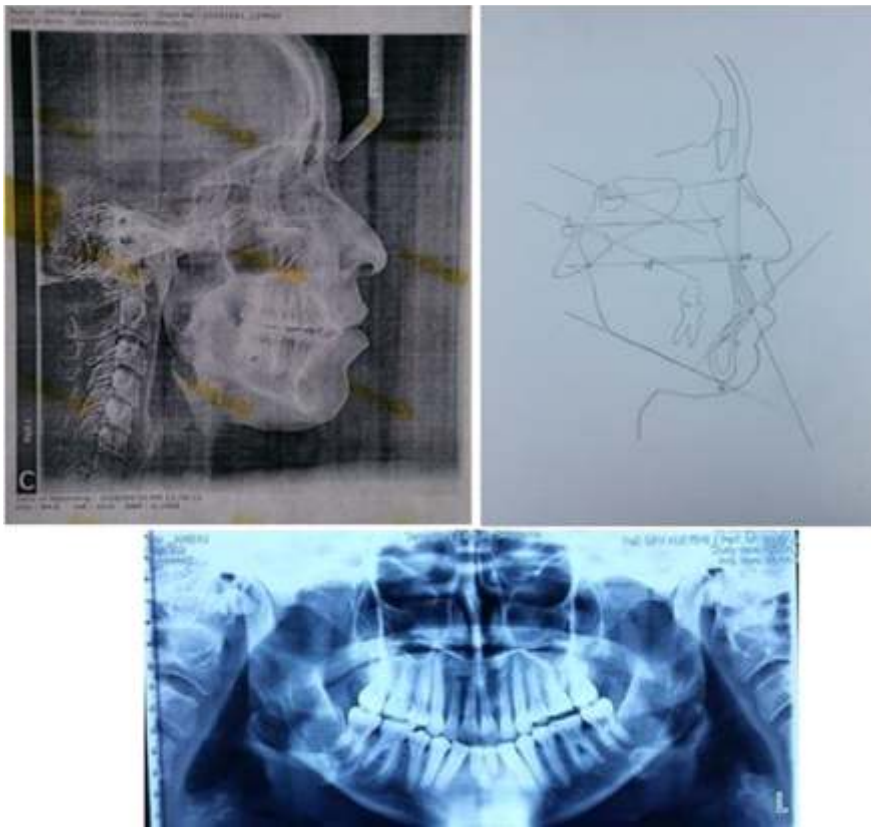


Figure 8: Post treatment radiographs

Table 2: Pre treatment Cephalometric Analysis

Parameter	Post treatment	Pre treatment	Normal Value	Analysis
SNA	83	80°	85.3 ±2.7°	Normal
SNB	80	74,5°	82.5±3.5 °	Normal
ANB	3	5.5°	2-4 °	Normal
SKP	1	2		
U1-MXP	112	128°	119-127 °	Decreased
L1-MDP	112	96.5°	96-104 °	Increased
U1-L1	112	113°	108-116 °	Normal
MMPA	26.5	23°		
FMPA	25.5	26.5°	24-26 °	
LFHP	60	54.5%		



Figure 9: Pre and Post treatment photographs

Treatment results

The teeth were well aligned and leveled at the end of treatment. The Class I molar and canine relationships were maintained. Lip competence was achieved with a satisfactory consonant smile; the mandibular midline was corrected; overjet and overjet reduced; spaces closed; crown conversions of mandibular canines to lateral incisors and mandibular first premolars to canines (Figures 5, 6, 7 and 9)

The post treatment cephalometric analysis showed that the normal mandibular and maxillary incisal angles were achieved with satisfactory soft tissue balance; root parallelism was also achieved. (Figure 8, Table 2).

Discussion

We treated a case of moderate crowding of the maxillary anterior with bilaterally missing mandibular lateral incisors amongst other malocclusion traits.

In order to create space for the resolution of the maxillary anterior crowding and also have space to reduce the overjet, extractions of the first maxillary premolars were carried out.

The mandibular lateral incisors were bilaterally missing and after discussing treatment options with the patient, we agreed that the best option for the patient was to close the space orthodontically and carry out crown conversions accordingly. Among the Caucasians,[7] the maxillary lateral incisors are the most commonly missing teeth while the mandibular incisors are the most commonly missing among the Japanese.[8]

The treatment of this patient progressed according to plan starting with surgical extractions of impacted teeth, routine extractions of the maxillary first premolar teeth, fixed orthodontic appliance therapy, crown conversion and finally retention. The objectives of treatment were achieved as shown in the steps outlined.

Conclusion

This shows that the malocclusion in the 33 year old female was successfully treated with upper and lower fixed orthodontic appliance therapy.

An aesthetic ad stable occlusion was achieved at the completion of treatment. Hawley's retainers were used to ensure stability of treatment outcome.

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Measurements of length, height, weight, and volume should be reported in metric units, i.e., meter(m), gram(g), or liter(l) or their decimal multiples.
Milliliter or deciliter should be expressed as ml or dl.
Red and white blood cell counts are to be expressed as 63 x10 /mc l and x10/ mc respectively. Temperatures should be given in degrees Celsius and blood pressures in millimeters of mercury (mmHg). All hematological and clinical chemistry measurements should be reported in the conventional system or in terms of the International System of Units (SI).

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The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement. Year, month, day, hour, minute and second should be abbreviated as yr, mon, d, h, mm, and s in tables respectively.

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Appendix 1:

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