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Case Report

Interdisciplinary approach for the management of hypodontia in orthodontics -A case report

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Abstract

Hypodontia is the congenital absence of one or more teeth and may affect permanent teeth. Depending on the number and position of missing teeth, it may influence aesthetics, mastication, speech, and occlusal equilibrium. Hypodontia therapy includes primary tooth maintenance or space redistribution for partial adhesive bridges, tooth transplantation, and implants. However, an interdisciplinary approach is the most important requirement for the ideal treatment of hypodontia. This case outlines an interdisciplinary treatment strategy for congenitally absent permanent maxillary right lateral incisors, as well as maxillary second premolars and mandibular left second premolar that involves orthodontic and prosthodontic skills.

Keywords: Hypodontia, Agenesis, Multiple missing teeth, Implant failure.

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1. Introduction

Treatment of patients with dental agenesis is intended to restore both aesthetics and functionality and should be administered by an interdisciplinary team. The prevalence of agenesis in the permanent dentition is generally reported to increase over time and can range from 1.6% to 36.5%, depending on the population under investigation. The lower second premolar is the most frequently absent tooth, followed by the upper lateral incisors. Upper lateral incisors are frequently affected by bilateral agenesis, whereas lower second premolars are more likely to exhibit unilateral agenesis.[1]

Studies indicates a rise in the frequency of hypodontia over recent decades; however, there is little data to ascertain whether this apparent increase is related to improved screening and diagnostic procedures or other causes.[2] In cases of unilateral tooth agenesis, space opening is often favoured to enhance patient aesthetics and maintain smile symmetry. Conversely, in instances of bilateral agenesis, both space closure and space opening are feasible.[3-4] In addition to an undesirable aesthetic, patients with absent permanent teeth may experience complications including malocclusion;[5] periodontal damage, insufficient alveolar bone development, impaired chewing potential, impaired pronunciation, alterations in skeletal relationships, and a disfiguring appearance,[6] many of which necessitate expensive and complex interdisciplinary interventions.

In general, the treatment that is required is based upon the pattern of tooth absence, the amount of residual spacing, the presence of malocclusion, and the beliefs of the patient. A multidisciplinary and costly treatment regimen may be one of the primary factors contributing to its success. The focus of this article is to illustrate a hypodontia case in which the treatment plan involved the work of prosthetic, implantology, and orthodontic specialists.

2. Diagnosis and Treatment Plan

A 21-year-old female presented with the chief complaint of spacing in upper and lower teeth. The patient had a convex profile, mesocephalic head, mesoprosopic face and an acute nasolabial angle. Intraorally, patient had Class I molar

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relationship on both the sides, congenitally missing upper bilateral second premolars, upper right permanent lateral incisor and lower left second premolar. However, patient had retained and decayed lower left second deciduous molar and peg-lateral on upper left side. The overbite was 1mm and an overjet of 3mm was noted. There was a spacing in upper anterior region with midline deviated 3mm towards right side (**Figure 1**).

In the Panoramic radiograph confirmed the absence of upper second premolar bilaterally, upper right permanent lateral incisor and lower left second premolar.

Cephalometric analysis (**Table 1**) indicated a Class I malocclusion (ANB = 1°) with proclined upper and lower incisors (UI-NA= 7mm, 28˚and LI-NB= 9mm, 31˚)

Primary treatment objectives were to maintain Class I molar relationship, manage spacing in both upper and lower arches, achieve an ideal overjet, overbite, establish a functional occlusion, and achieve a pleasing soft-tissue profile.

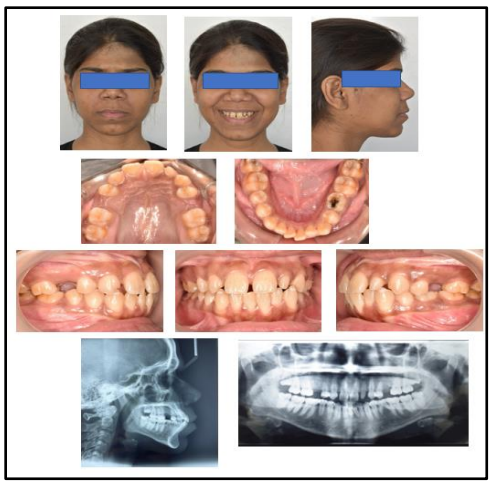

Figure 1: 21-year-old female patient with Class I molar relationship, congenitally missing upper bilateral second premolar, upper right permanent lateral incisor and lower left second premolar upper peg-lateral on left side and retained decayed lower left second deciduous molar before treatment.

Figure 2: Banding and bonding of upper arch was done using a pre-adjusted edgewise appliance (.022" x .028" slot MBT prescription, 3M Unitek) for leveling and aligning.

Figure 3: Open coil was placed on .017" x .025" stainless steel wire in the upper arch with simultaneous bonding of lower arch with .012" nickel titanium with upper archwire.

Figure 4: After 10 months of treatment .019" x .025" stainless steel wire were placed in both upper and lower arch.

Figure 5: Retraction was begun with active tieback in both the arches.

Figure 6: After 17 months of treatment triangular elastics were given for intercuspation.

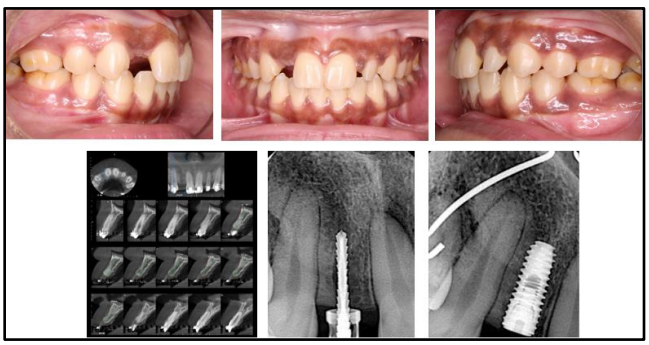

Figure 7: Implant placed in upper right lateral incisor region

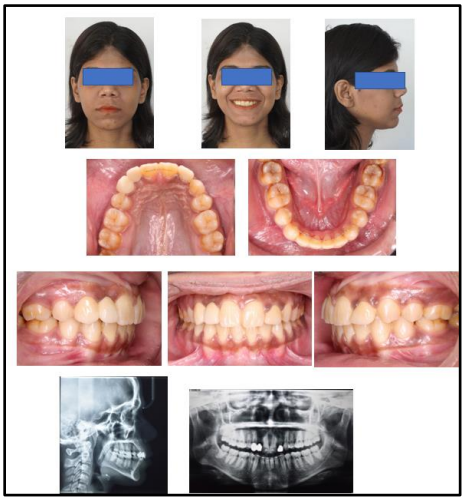

Figure 8: Patient after 24 months of treatment with improved smile aesthetics.

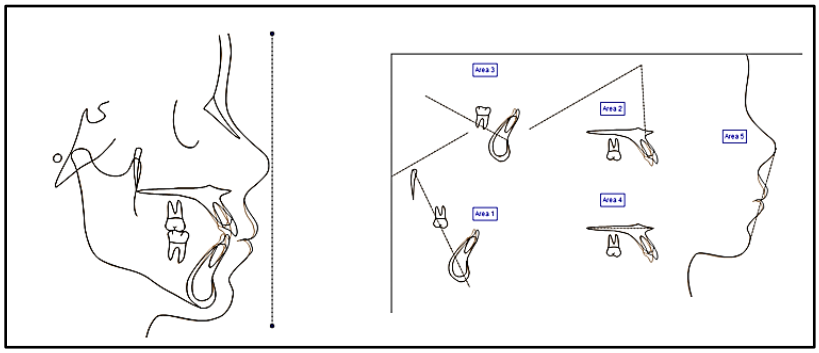

Figure 9: Superimposition of pre-treatment (black), and post-treatment (red) cephalometric tracing

Table 1: Cephalometric analysis

S. No.	Parameter	Norm	Pre-treatment	Post-treatment
1.	SNA	82˚	84 ˚	80˚
2.	SNB	80˚	83˚	80˚
3.	ANB	2˚	1˚	0˚
4.	Mandibular plane angle (SN-GoMe)	32˚	33˚	33˚
5.	Y-axis {S-N to S-Gn (outer angle)}	66˚	68˚	68˚
6.	Facial axis angle {B-Na to Ptm- Gn (Inner angle)}	90˚	88˚	88˚
7.	U I to N-A (mm)	4mm	7mm	4mm
8.	UI to N-A (angle)	22˚	28˚	24˚
9.	LI to N-B (mm)	4mm	9mm	4mm
10.	LI to N-B (angle)	25˚	31˚	28˚
11.	UI to LI (interincisal angle)	131˚	117˚	127˚
12.	Upper incisor to S-N plane	102˚ ± 2	130˚	120˚
13.	IMPA (Incisor mandibular plane angle)	90˚	98˚	92˚
14.	Upper lip to S-line	0-2mm	7mm	2mm
15.	Lower lip to S-line	0-2mm	6mm	2mm
16.	H angle	7˚-15˚	19˚	16˚
17.	Nasolabial angle	94˚-110˚	101˚	92˚
18.	Mentolabial sulcus	5mm ± 2	4mm	3mm

2.1. Treatment options

Following treatment plan were discussed with the patient,

1. Extraction of lower right second premolar followed with retraction of upper and lower anterior teeth to reduce the midfacial convexity and replacement of upper right lateral incisor with implant and crown over upper left peg-lateral.
2. The alternate treatment option involved closing of all spaces by mesialization. This would not have corrected the mid facial convexity. Due to the patients heightened concern for her esthetics she has opted for first treatment option.

2.2. Treatment progress

After the appropriate oral prophylaxis, treatment started with extraction of mandibular right second premolar and left second deciduous molar. MBT .022" x .028" brackets were bonded with molar tubes banded in the upper arch. Initially leveling and aligning were performed on .012", .014", .016", .016" x .022" Nickel Titanium archwire, which was progressed up to .016" x .022" stainless steel wires for complete alignment (**Figure 2**).

After 5 months an open coil was placed on .017" x .025" stainless steel wire in the upper arch, between upper right central incisor and canine for gaining space for future prosthesis and sleeve was placed between upper left central incisor and canine to preserve space for crown. Simultaneously, lower arch banding and bonding was initiated with .014" nickel titanium archwire (**Figure 3**).

After 10 months of treatment both the arches were well aligned and a sufficient space in maxillary arch was gained. Immediately the wire was progressed to .019" x .025" Stainless steel wire in both maxillary and mandibular arches with sleeves placed bilaterally in upper arch between central. Incisor and canines and on either side of upper left peg-lateral incisor for future prosthesis and crown respectively (**Figure 4**). Subsequently retraction was begun on .019" x .025" stainless steel, with active tie back on both the arches (**Figure 5**).

After 17 months of treatment .014" Nickel Titanium archwire was placed in both maxillary and mandibular arch with triangular elastics (3/16", 6oz) on upper right first premolar, lower right first premolar and lower right first molar, also on the left side on upper left canine and lower left canine, lower left first premolar followed by upper left first premolar and lower left premolar and molar for two months to allow settling and to promote intercuspation.

A close coil was placed one side and sleeve on the other to maintain space for future prosthesis and crown respectively (**Figure 6**).

After 19 months of treatment when complete alignment was achieved in both the arches, the case was debonded and essix retainer in upper and fixed retainer was placed in lower arch. An implant was placed in upper right lateral incisor region that was left for osseointegration and bone healing for 3 months (**Figure 7**). After 3 months, an IOPA was performed to assess osseointegration; nevertheless, it was incomplete. Consequently, a plan was made to wait for one additional month. Following this period, a punch was performed to position the healing cap, but we discovered that the implant was mobile, necessitating its removal. The patient was informed; however, the patient was not interested in a second implant surgery, therefore planned for a cantilever bridge for missing right lateral incisor and porcelain crown on upper left peg-lateral.

Total treatment timing was 24 months (**Figure 8**). A fixed retainer was bonded immediately on upper centrals.

3. Treatment Results

The post-treatment photographs showed a significant improvement in the facial profile with functional occlusion. The forward inclination of the upper incisors was addressed, resulting in Class I molar and canine relationship bilaterally with ideal overjet and overbite. The overbite and the overjet were improved. The smile was pleasant and optimal alignment was achieved in both the arches without compromising periodontal health. The panoramic radiograph obtained after the treatment indicated root parallelism. Superimposition of pre and post-treatment showed significant reduction in upper and lower incisor proclination (**Figure 9**).

4. Discussion

The anterior region's aesthetics are key for patient satisfaction. Early and appropriate orthodontic intervention can prevent bone loss in the hypodontic areas and establish root parallelism to facilitate implant insertion surgery.[7,12] The aim of treating hypodontia patients by substituting absent teeth is to restore functions such as movement and mastication. Patients, however, prioritise the cosmetic replacement of missing teeth.

Another treatment plan could be mesialization of entire dentition to close down the spaces, however in this case, decision to close down premolar spaces to correct the facial convexity and opening the space for replacing the lateral incisor with implant.[8]

Patients with tooth agenesis and a greater quantity of lost teeth exhibit higher satisfaction with dental implant therapy compared to those with tooth loss. The use of dental implants may represent the optimal solution for individuals with hypodontia due to the procedure's predictability, stability, and superior aesthetic outcomes.[9]

Multiple missing teeth are linked to a decline in cortical bone density, which significantly puts at risk dental implants' ability to survive and function.[10] In this case the implant was observed unstable involving decrease in bone density.

Anterior dental implant placement was shown by Hvaring et al. to be inadequate for the treatment of patients with severe hypodontia.[11]

Restoring lost upper lateral incisors with a cantilevered bridge may represent an effective option for the medium to long term. The choice of replacement for a lost maxillary lateral incisor should be influenced by other criteria, including as the patient's age, occlusion, and the general condition of their teeth.[12] In addition, this type of cantilevered bridge requires healthy abutment teeth, as it relies on a single tooth for support.

This case effectively demonstrates the management of hypodontia of three second premolars and a maxillary lateral incisor, resulting in optimal intercuspation, overbite, overjet, long-term stability, and attractive smile enhancement.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Bilgin N, Kaya B. Etiology and treatment alternatives in tooth agenesis: A comprehensive review, *Stomatol Dis Sci.* 2018;29:2-11.
2. Mattheeuws N, Dermaut L, Martens G. Has hypodontia increased in Caucasians during the 20th century? A meta-analysis, *Eur J Orthod*. 2004;26(1):99-103.
3. Rosa M, Zachrisson B. The space-closure alternative for missing maxillary lateral incisors: an update, *J Clin Orthod.* 2010;44(9):540-61.
4. Argyropoulos E, Payne G. Techniques for improving orthodontic results in the treatment of missing maxillary lateral incisors – a case report with literature review, *Am J Orthod*. 1988;94(2):150-65.
5. Khosravanifard B, Ghanbari-Azarnir S, Rakhshan H, Sajjadi SH, Ehsan AM, Rakhshan V. Association between orthodontic treatment need and masticatory performance, Orthodontics (Chic.). 2012;13(1):2-8.
6. Behr M, Proff P, Leitzmann M, Pretzel M, Handel G, Schmalz G. Survey of congenitally missing teeth in orthodontic patients in Eastern Bavaria, *Eur J Orthod*. 2011;33(1):32-6.
7. Borzabadi-Farahani A. Orthodontic considerations in restorative management of hypodontia patients with endosseous implants, *J Oral Implantol*. 2012;38(6):779-91
8. Ferrer MC, Northway W, Wilmes B. Mesialslider for treatment of congenitally missing upper lateral incisors, *J Clin Orthod.* 2024;58:489-97
9. Lazzara R, Siddiqui AA, Binon P, Feldman SA, Weiner R, Phillips R. Retrospective multicenter analysis of endosseous dental implants placed over a five-year period, *Clin Oral Implants Res*.1996;7:73-83.
10. Rakhshan V. Congenitally missing teeth (hypodontia): A review of the literature concerning the etiology, prevalence, risk factors, patterns and treatment, *Dent Res J.* 2015;12(1):1-13.
11. Hvaring CL, Ogaard B, Birkeland K. Tooth replacements in young adults with severe hypodontia: Orthodontic space closure, dental implants, and tooth-supported fixed dental prostheses. A follow-up study, *Am J Orthod Dentofacial Orthop*. 2016;150(4):620-26.
12. Karray S, Gassara Y, Boudabous E, Nasri S, Nouira Z, Hajjami H. Replacing Missing Maxillary Lateral Incisors by CAD/CAM PMMA Cantilever Bridges, *Case Rep Dent*. 2023;8:430.

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