INTERDISCIPLINARY APPROACH FOR MANAGEMENT OF MISSING MAXILLARY INCISOR–A CASE REPORT

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Abstract

Most of orthodontic patients seek orthodontic treatment for improving their smile esthetics. Maxillary anterior teeth are more prone to fracture or loss especially when these teeth are proclined. Loss of these teeth results in functional impairment, impaired esthetics, and psychological impact on patient. Anterior teeth play a prime role in smile and facial esthetics. Treatment of such cases is needed to improve functions and esthetics. Treatment options include space closure, regaining space and prosthetic replacement for lost tooth This paper describes a case report of a patient who has lost one maxillary incisor and also having proclination and spacing in both arches.

Keywords: Smile esthetics, incisor, facial profile, permanent teeth.

Introduction

Facial esthetics is an important concern in today's social life. Dental esthetics has prime importance in overall facial appearance. A pleasing dental appearance plays a key role in framing an esthetic smile and smile is one of the prime human facial expressions and it increases value of face.[1] Most of orthodontic patients seek orthodontic treatment for improving their smile esthetics. Awareness has been increased in people for orthodontic treatment nowadays. Fixed orthodontic treatment can change and enhance esthetics of smile and facial appearance. There are many reasons that make patients to get treatment. These include irregularity in teeth, spacing in teeth, Proclination or retroclination of teeth etc. Spacing can occur in both primary and permanent dentition. In primary dentition spacing is common condition and it has prime importance as it is an indicator for favorable development of permanent teeth. If spaces are not present in primary teeth, it results in crowded permanent teeth.

The incidence of spacing in deciduous dentitions ranges from 98% to 42.9%. Most authors observed an incidence of around 90%. Spacing is more common in the maxilla rather than the mandible and in boys as compared to girls.[2-5]

In primary teeth, spaces develop as they grow up because their jaw is getting bigger and their deciduous teeth remain the same size.[6] Children may also have temporary spaces as their deciduous teeth start shedding out. In deciduous dentition spaces do not cause any harm, rather they are needed for normal development of permanent teeth. Spacing in permanent central incisors is called ad midline diastema. Diastema appears most often in between the two upper central incisors, though spaces can occur between any two teeth and it can happen due to the result of discrepancy between the size of the jaws and size of the teeth. It may also be caused by missing teeth, Microdontia, large labial frenum or habits like thumb sucking.[7]

Case report

Patient came to Department of Orthodontics with chief complaint of forwardly placed front teeth with spacing in upper and lower teeth.

Patient gave history of trauma 7 years back, leading to loss of upper right central incisor and left central incisor became non vital and RCT treated.

Extra oral examination

Extra oral examination revealed convex facial profile, posterior divergence with incompetent lips (fig.1).

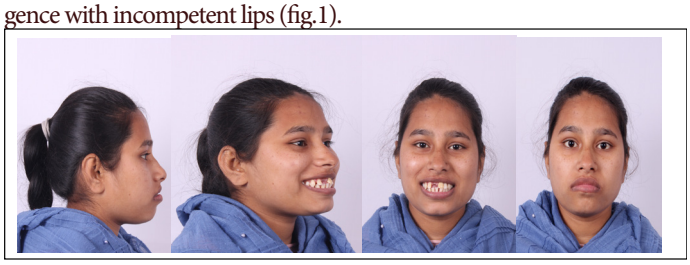


Figure No.1: Pre treatment extra oral photographs of patient

Intra oral examination

On intra oral examination, it was observed that patient has class I molar relation on both right and left sides and class III canine relation on right side and class I on left side with anterior edge to edge bite. All teeth present except maxillary left 3rd molar and mandibular left 3rd molar and maxillary right central incisor. Both maxillary and mandibular arches were U shaped, symmetrical with spacing in anterior region in upper arch and generalized spacing in mandibular arch Fig.2(a-e).

a. Frontal View

b. Mandibular occlusal view

c. Maxillary occlusal view

d. Left lateral view

e. Right lateral view

Figure No.2(a-e): Pre treatment intra oral photographs

Radiographic examination

OPG findings showed dilaceration with respect to mandibular second premolar. Third molars are impacted in left side of upper and lower arch and they were in Nolla stage 9 (fig.3)

Figure No.3: Pretreatment OPG of patient

Cephalometric findings: (Table 1)

1. According to Steiner's analysis, patient has Average Maxilla & Mandible, proclined upper & lower incisors with average growth pattern.
2. According to Tweeds analysis, patient is having average FMA, with proclined incisors.
3. According to Rakosi Jarabacks analysis, patient is having increased saddle angle indication posterior position of condyle and patient having increased Jarabacks ratio that indicates horizontal growth pattern.
4. According to Holdways analysis, patient is having increased H-line angle, increased upper lip strain, protrusive lower lip & decreased soft tissue thickness.
5. According to Burstone analysis, patient is having convex profile, maxillary prognathisim, and prognathic mandible with upper short lip.

Parameters	Value
SNA	83 degrees
SNB	81 degrees
ANB	2 degrees
MAXILLARY LENGTH	82 mm
MANDIBULAR LENGTH	105mm
IMPA	104 degrees
NASOLABIAL ANGLE	103 degrees
U1 TO NA degrees	37 degrees
U1 TO NA MM	10mm
L1 TO NB DEGREES	40 degrees
L1 TO NB MM	13mm
U1 TO L1 ANGLE	102 degrees
SADDLE ANGLE	132 degrees
ARTICULARE ANGLE	143 degrees
GONIAL ANGLE	129 degrees
FMA	28 degrees
Y AXIS	60 degrees

Table No.1: Pre treatment cephalometric measurements

Diagnosis

Female patient aged 17 years old was diagnosed with Angles Class I mo-

lar relationship, class I skeletal pattern. She is having spacing between anteriors in lower and upper arch with convex profile, having bimaxillary protrusion and localized unilateral posterior open bite. Patient is having habitual tongue thrust and proclined upper and lower teeth with average growth pattern.

Problem list

- Proclined upper and lower incisors
- Edge to edge anterior bite
- Spacing in both arches
- Rotations with respect to 14, 44 and 45.
- Missing right maxillary central incisor.

Treatment objectives

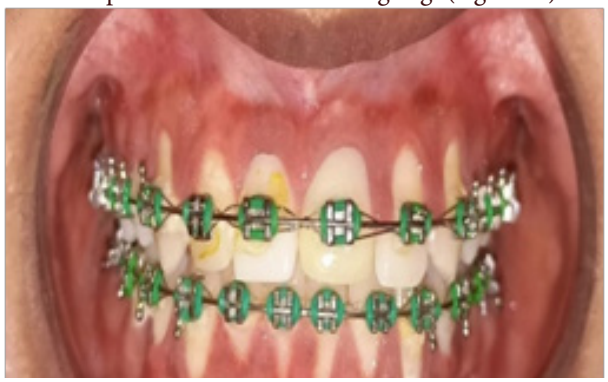
- To maintain class I molar relationship on both sides.
- To achieve class I canine relation on right side and to maintain class I on left side
- To achieve proper overjet and overbite.
- To achieve pleasing smile and facial profile
- To close spaces in both arches.
- To restore missing central incisor.

Treatment plan

- Non Extraction treatment plan was decided by considering all findings and patient's chief complaint
- Fixed Orthodontic treatment with MBT 0.022 slot prescription was planned.
- After initial alignment with NiTi wires, space by use of 0.019" x 0.025" rectangular stainless-steel wires.
- Final finishing and detailing with 0.014" round stainless-steel wires.
- Retention by means of Begg's Wrap-around retainers along with lingual bonded retainers in the upper and lower arch.

Treatment progress

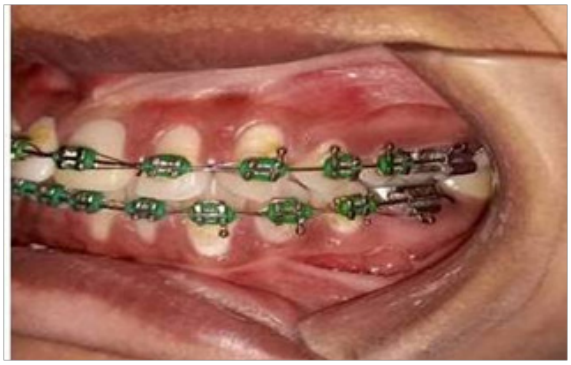
Complete bonding & banding in both maxillary and mandibular arches was done, with MBT-0.022X0.028" slot. Initial 0.012" NiTi wires were used in both arches which were followed by 0.014, 0.016", 0.018", NiTi arch wires. After alignment and leveling with NiTi round. Rectangular NiTi wires followed by rectangular stainless-steel wires. Retraction and closure of existing spaces was started by use of 0.019" x 0.025" rectangular stainless-steel wires. Retraction and closure of existing spaces was done with the help of Elastomeric chains delivering light continuous forces and replaced after every 4 weeks. Space is maintained for prosthetic restoration of lost upper right central incisor. Temporary crown was placed during treatment. Spaces were closed in both arches. At present, spaces has been closed, Class I canine and molar relation on both sides and patient is in occlusion settling stage (Fig. 4a-4e)



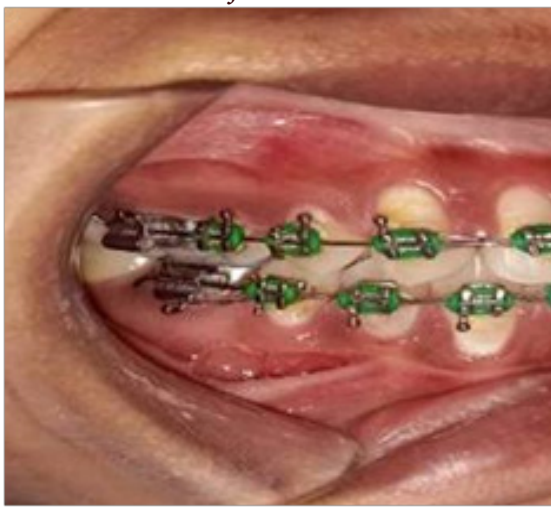
a. Frontal view

b. Maxillary occlusal view

c. Mandibular occlusal view



d. Left lateral view



e. Right lateral view

Figure No. 4(a-e): After closure of all spaces in both arches

Discussion

An attractive smile in modern day society is considered an asset in work settings and social interaction, as it plays an important role in facial expression and appearance.[8]

Missing maxillary incisors have a major impact on facial and smile esthetics, which affects self-esteem and general social interaction of an individual.[9]

This paper presented case report of a patient with lost maxillary incisor along with spacing and proclination of anterior teeth.

Loss of anterior tooth leads to tipping of adjacent teeth, overeruption of antagonist teeth, deviation of midline to one side, masticatory impairment, speech problems, and lingual dysfunction. The conditions which are favorable for space regaining are normal intercuspation of posterior teeth with well aligned anterior teeth, spacing in maxillary dentition, more size difference of canine and premolar. The cases which favour space closure are the crowding in maxilla with balanced profile, similar size of canine and premolar, Class II malocclusion, and mild proclination of anterior teeth.[10] In present case there was spacing present and we planned to close spaces and maintain space for prosthetic replacement for central incisor.

In an ideal female profile, the lips should be slightly everted towards their base, displaying several millimeters of vermilion border, and the upper lip should be positioned slightly anterior to the lower lip. The mentolabial sulcus must form an S-shaped curve in both the upper and lower portions. Furthermore, chin prominence should be slightly smaller than lower lip prominence. In this patient, all these characteristics were adversely affected by increased overjet and lower lip interposition, which was adequately resolved by the treatment performed.

Before starting the case we did kesling setup for the case, and according with the case as non extraction. In this case, a minimal anchorage was used as anchorage for closing of generalized spacing in both the arches. Moreover the patient smile was fair as there was missing central, for that we gave acrylic crown in order to maintain space and for the aesthetic purpose. The patient was skeletally class I and she was having class I molar relation on both sides but incisal relation was edge to edge (class III). In the post-treatment phase the lower incisors were moved backward in segmental technique, canine followed by incisors by short e chain. Thus, the spacing was corrected primarily by slightly figure of eight consolidation and slight retraction of the maxillary incisors with lip compentency. The patient is on settling phase, When carefully planned, however, great results with lasting stability can be achieved.

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