



Holistic Approach in Replacement of Avulsed Permanent Maxillary Central Incisor – A Case Report

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Abstract

Orthodontic space closure is one of the treatment alternatives when a maxillary central incisor is missing due to various reasons like congenital absence, extracted or avulsed. Among various treatment

modalities, closure of central incisor space by substitution with ipsilateral lateral incisor provides favorable esthetic outcome. Various factors such as esthetics, occlusion and individualization of orthodontic appliances are taken into consideration in treatment plan.

Keywords

Dental avulsion, Cuspal interdigitation, gingival zenith

Introduction

Dental avulsion term describes the complete removal of a tooth out of its socket due to trauma. The frequency of avulsion accounts for approximately 0.5-6.2% of dental traumatic injuries¹. The teeth, which are most affected from avulsion injuries, are maxillary central incisors². Trauma results in functional and aesthetic disturbance in patients which affects psychologically more than physical loss of teeth. Treatment options for patients with missing or extracted maxillary central incisor includes fixed or removable prosthesis, orthodontic correction³, maintenance of edentulous space to place implant after growth completion. The choice of appropriate treatment depends on factors like number of missing tooth, existing occlusion, age of the patient, space conditions, soft tissue profile of the face⁴. However, replacing the central incisor with mesial movement of the lateral incisor seems to be the best esthetic treatment option⁵. The type of malocclusion, cuspal interdigitation, space condition, width of lateral incisor and length of its root are the significant factors need to be considered. This article highlights combined approach of fixed orthodontic treatment and biomimetic restoration in management of missing maxillary central incisor.

Issues to Be Considered

- Age of the patient.
- Amount of available edentulous space.
- Difference in crown dimensions between central incisor and lateral incisor.
- Angulation of the lateral incisor: When unilateral central incisor is missing, it is helpful if the lateral incisor and adjacent central incisors are more parallel than normal.
- Emergence profile of tooth⁴.
- Gingival zenith of the maxillary anterior teeth^{3,7}.
- Timing of the restoration: In those patients in whom the shape of the lateral incisors is abnormal, it may be preferable to carry out the composite restoration prior to the beginning of orthodontic treatment. However, in majority of the cases, the restorative treatment is carried out following the orthodontic treatment.

Case Report

A 12-year old girl presented to the Department of Pedodontics and Preventive Dentistry, S.C.B Dental College and Hospital, Cuttack, Odisha with chief complaint of missing upper front teeth. There was history of trauma before 1 year. On clinical examination, space in relation to avulsed left central incisor was reduced and 22 was mesially inclined (Fig. 1-4). Angle's Class-I molar relation was present on both sides (Fig. 2)

After radiographic examination and cast analysis, fixed orthodontic treatment was initiated with sequential arch wires 0.012", 0.014", 0.016", 0.016×0.022" NiTi and 0.016×0.022" S.S. Short elastic chain was used to mesialize 22 towards 11 (Fig. 5,6). Then composite restoration was done after shade

selection, on both the proximal surfaces of 22 to biomimetically replicate shape and size of 21 (Fig. 7).

Discussion

This article enumerates the various factors to be considered in patients with missing maxillary central incisors. Concerns in management of missing central incisor includes treatment complexity, the risk of space opening, the increased load on the root of lateral incisor when supporting the larger crown of central incisor and the quality of the esthetic result. A recent study on the outcome of orthodontic space closure with a missing maxillary central incisor revealed that the replacement of the central incisor by lateral incisor was challenging and more time consuming, the restorative reshaping of a lateral incisor to central incisor morphology was difficult and patients were more

concern about space reopening. However, when the lateral incisors are mesialized to the place of central incisors, a new soft tissue relation is established with marginal gingiva which needs to be preserved during the continuous growth of the dentofacial complex⁵. In the present case, the lateral incisor was bodily mesialized towards 11 so that the roots of 22 and 11 were parallel and prevent large gingival embrasure or black triangle that compromise the esthetics⁶.

As the lateral incisors are small in dimension as compared to the central incisors, they need to be positioned slightly labially and the vertical height of the crown over them should be slightly short to avoid excessive stress during protrusive movement of the mandible.

Figures



Fig 1: Pre-op Frontal view



Fig 2: Left lateral view of avulsed 21



Fig 3: Maxillary occlusal view

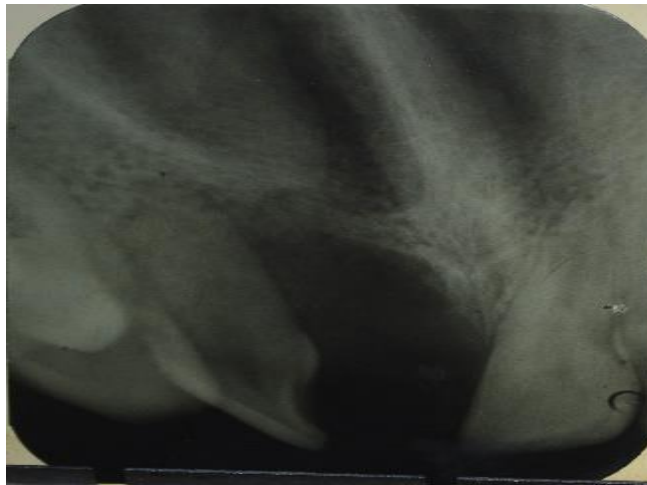


Fig 4: IOPA of avulsed 21 and 22



Fig 5: Mesialization of 22



Fig 6: Mesialized 22



Fig 7: Recontoured 22 to 21

Conclusion

Replacement of maxillary central incisors by lateral incisors is a clinical challenge to the orthodontists. The clinical results of replacing both maxillary central incisors with mesially moved lateral incisors were satisfactory to the patient. Individualization of the orthodontic appliance and proper periodontal and restorative procedures are required for optimum result.

Various issues discussed in this article will definitely provide some helpful guidelines to orthodontists for managing patients with replacement of maxillary central incisors by lateral incisors.

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