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## Case Report

## Facilitated orthodontic tooth movement with periodontal intervention: A case report

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## ABSTRACT

Maxillary central incisors play a significant role in the facial aesthetics as it forms a major component of smile. We report a 27 years old male patient undergoing orthodontic treatment for the forceful traction of impacted maxillary central incisors into the occlusion who presented with a fusion of the gingiva and lips in the maxillary anterior region obliterating the maxillary labial vestibule and entrapping the orthodontic retractors earlier placed. Vestibuloplasty was carried out using scalpel and electrocautery to regain the vestibular depth followed by exposure and traction of the impacted maxillary central incisors into occlusion. The patient achieved excellent results which was realised at one-year follow-up, by which time orthodontic treatment was also completed. The case is being described because of the unusual fusion of lips and gingiva, and hence requires careful treatment planning for successful outcomes.

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## 1. Background

The aim of dental treatment is to restore the normal functioning of the masticatory complex along with the maintenance of the facial aesthetics. In the present era, growing awareness about facial aesthetics has become a major concern for the dental surgeons. In order to achieve all the goals there is a need for a comprehensive treatment planning via multidisciplinary approach. The relationship between Periodontics and Orthodontics is similar to that of symbiosis. In order to achieve a successful orthodontic outcome a healthy periodontium is of utmost importance. Similarly, many a times gingival recession resulting from malalignment of teeth can be corrected merely by orthodontic treatment without any periodontal intervention.

Maxillary central incisors form the major part of the facial aesthetic zone and are therefore of prime importance

to dentist as well as the patient. Impaction of maxillary central incisors is uncommon and therefore, requires careful attention by the dental surgeons while managing such cases. The maxillary central incisor impaction may be caused due to several systemic and local causes like delayed or failed eruption of the tooth, presence of a supernumerary tooth, displacement of the tooth bud which accounts for about 0.06-2% of impactions.<sup>1-3</sup> Exposure of impacted tooth requires both retraction of the tooth along with removal of the overlying soft tissue and the bone obstructing the pathway of eruption.

## 2. Case Description

A male patient aged 27 years undergoing orthodontic treatment for the forceful traction of the impacted maxillary central incisor was referred to the Outpatient Department of Periodontics of I.T.S. Dental College, Hospital and Research Centre, Greater Noida, U.P. India, for the surgical exposure of the impacted maxillary central incisors. Patient

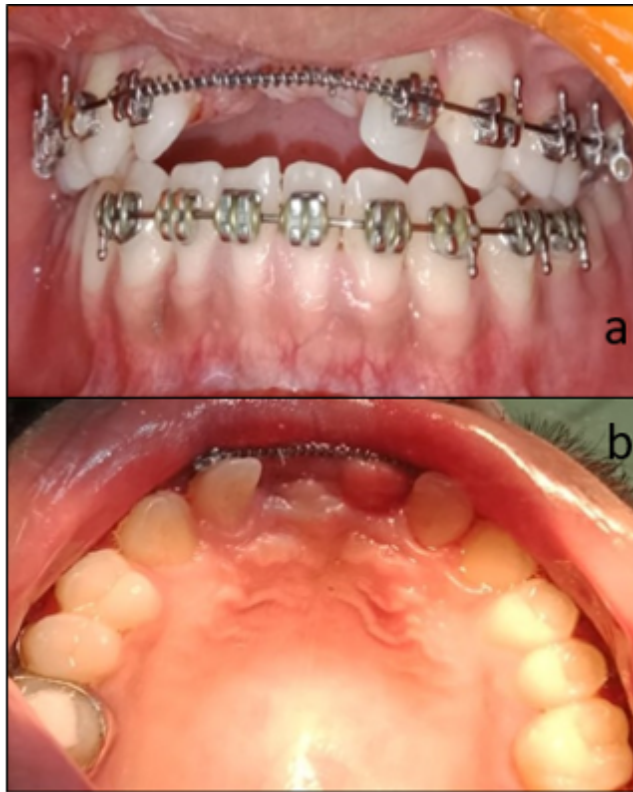
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presented with an obliterated vestibule caused due to fusion of the labial mucosa and the gingiva entrapping the retractors previously placed on the impacted incisors, impairing the visibility of the location of the retractors. As per the medical records obtained from the concerned orthodontist a 0.019x0.025 inches stainless steel wire with an open coil spring was placed to maintain the space for the eruption of the impacted teeth along with the retractors attached to the coil on one end and the teeth on the other (Figure 1). The impacted central incisors were observed to be mesially rotated on the radiographs (Figures 2 and 3).

Further history did not reveal any medical cause to explain etiology of impaction. The treatment plan was then formulated in form of vestibuloplasty for deepening of the obliterated vestibule for the exposure and activation of the retractors followed by forceful traction of the impacted maxillary central incisors into the occlusion.

This was explained to the patient and a written informed consent was obtained. After an anaesthetic clearance, on day of surgery, patient was administered with Infraorbital Nerve Block on both the sides along with infiltration of local anaesthetic agent (Lignocaine with 1:80,000 Adrenaline).

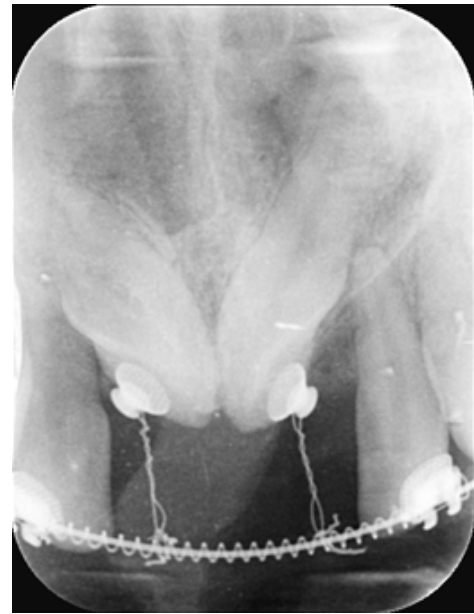


**Fig. 1: a:** Pre-operative view showing missing central incisors and obliterated maxillary vestibule; **b:** Palatal view.

The first part of procedure aimed at deepening of the obliterated vestibule to gain accessibility to path of placement of retractors in order to expose the impacted



**Fig. 2:** Pre-operative Orthopantomogram (OPG)



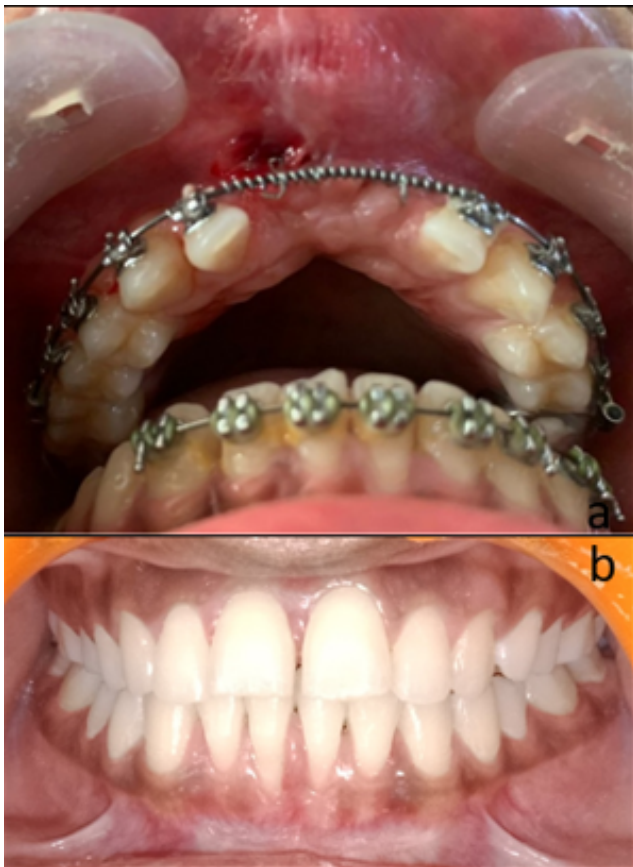
**Fig. 3:** Pre-operative IOPA as a guide to the retractors intra-operatively



**Fig. 4:** Exposure of the impacted incisors using electrocautery and scalpel.



**Fig. 5:** Periodontal dressing placed following exposure and vestibular deepening.



**Fig. 6: a:** 1 week post-operative; **b:** 1 year post-operative view.

teeth (Figure 4). Deepening was carried out using a scalpel with #15 blade and an electrocautery (only in the mucosal area, away from the metallic brackets and wires placed on the teeth), to release the fibrous attachments. Following deepening of the vestibule, as second part of the procedure, the incision was advanced in the apical direction to expose the incisal edges of impacted teeth by removing overlying soft tissue which was obstructing the path of eruption, to view the retractors. Periodontal dressing (Coe-Pak) was placed over the incision after the completion of the surgery allowing the wound to heal by secondary intention (Figure 5).

Post-operative instructions and medications were prescribed. The patient was recalled after one week for re-evaluation and activation of the retractors. He was followed up for 1 year, by which time full eruption of the central incisors was achieved and orthodontic treatment was completed (Figure 6).

### 3. Discussion

Management of impacted maxillary central incisors requires careful examination and treatment planning in collaboration between the orthodontist and the periodontist, as it is an important section of the aesthetic zone which has a major contribution to the smile of the person. Apart from the smile being affected, functional defect in form of impaired phonetics can also be encountered due to impaction. A detailed case history is therefore required to rule out the systemic factors responsible for impaction of the teeth.<sup>4</sup>

In the present case, cause of impaction was congenital and probably attributable to ectopic position of the tooth buds. The path of obstruction was due to presence of an overlying fibrous tissue formed by fusion of labial mucosa with gingiva when the teeth were exposed for placement of retractors. A Closed Eruption Surgical Technique (CEST) approach described by Becker A in 2012 was emulated for the forced eruption of impacted incisors with slight modification for deepening of the obliterated vestibule.<sup>5</sup> According to published literature, most of the impacted central incisors erupt spontaneously within a span of 1-2 years, following removal of the obstruction.<sup>6</sup> However occasionally, spontaneous eruption does not occur and requires additional treatment involving orthodontic traction for forced eruption of the impacted incisors. CEST which was followed in the present case yielded excellent results regarding both the aesthetics and periodontal outcomes. Temporary withdrawal of orthodontic traction following emergence of the teeth permits insertion of supracrestal fibres into cementum in an appropriate manner.<sup>7</sup>

The obliteration of maxillary labial vestibule is an oral manifestation commonly seen in children suffering from Ellis-van-Creveld syndrome also known as Chondroectodermal dysplasia, which is a rare genetic autosomal recessive disease seen in the Amish population



in the state of Pennsylvania, USA with no gender predilection.<sup>8</sup> However the present case did not have any such finding on history or examination. Such an observation of fusion with an obliterated vestibule could not be substantiated in published literature. Moreover, the etiology of fusion also could not be determined, as there was no evident medical history or examination findings suggestive of the same. At the end of the orthodontic treatment when the forceful exposure of the incisors into the occlusion was successful, the depth of the vestibule when checked was also adequate.

#### 4. Clinical Significance

Impacted maxillary central incisors are an uncommon entity. This uncommon entity not only requires awareness about its associated features, but also a careful management as these lies in the aesthetic zone and can also contribute to altered phonation. Absence of these teeth can adversely affect the social and psychological well-being of the patient.

The case described highlights that a conservative interdisciplinary approach when followed prioritizing the aesthetics and periodontal health can yield excellent results. A closed eruption surgical technique was followed in this case and the teeth were well aligned in the occlusion at the end of the fixed orthodontic treatment with a healthy periodontium.

#### 5. Conflicts of Interest

The authors declare that they have no conflict of interest.

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