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Inter-disciplinary approach for treatment of impacted central incisor with palatally impacted multiple supernumerary teeth: A case report

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Abstract

Impaction of maxillary permanent incisor is infrequently seen case in dental practice but its treatment is challenging because of its importance to facial esthetics. It is usually diagnosed accurately when there is delay in the eruption of the tooth as it affects the aesthetics. Supernumerary teeth are the main cause of impaction of upper incisor. Supernumerary teeth in the maxillary midline are common and they may not be visible clinically. Early detection of such teeth is important to avoid complications. Orthodontic alignment of such cases may become the method of choice over extraction or surgical repositioning

We report a case of 12-year-old male with a labially impacted left central incisor due to palatally impacted multiple supernumerary teeth. The impacted supernumerary teeth were removed surgically. With the application of an orthodontic traction, impacted left maxillary central incisor was brought down to its proper position in the dental arch.

Keywords: Impacted incisor, supernumerary teeth, surgical exposure, orthodontic alignment, modified window technique

Introduction

Impaction is the total or partial lack of eruption of a tooth well after the normal age of eruption [1]. The frequency of maxillary central incisor impaction ranges from 0.06% to 0.2% [2]. The contributing factors suggested for impaction could be mesiodens or multiple supernumerary teeth in the anterior maxillary region [3,4] odontomas or cysts, [5,6] altered eruption path or formation of scar tissue due to trauma or premature loss of the primary incisors [7,8] and abnormal root

angulation or dilacerations.[9] Supernumerary teeth are the main cause of impaction of upper incisor [10]

Orthodontic treatment of impacted maxillary incisor requires a well synchronized and interdisciplinary approach to obtain an acceptable esthetic and functional result [11]. The treatment and prognosis of impacted teeth depends upon various factors and include many treatments option like spontaneous eruption, surgical exposure with traction of tooth and sometimes extraction of tooth. This case report describes the interdisciplinary approach for the management of multiple impacted supernumerary teeth in the maxillary anterior region interfering with the eruption of the permanent central incisor. Combined surgical and orthodontic treatment employed to bring the impacted maxillary central incisor to its proper position in the dental arch.

Case presentation

A 12-year-old male patient reported to the Department of Orthodontics with the chief complaint of missing upper front tooth. The patient was physically healthy and had no history of medical and dental trauma.

The patient had a balanced facial pattern. Intraoral examination revealed an Angle's class I molar relationship and Canine relationship and a missing maxillary permanent left central incisor and no apparent arch length discrepancy in maxillary arch and mild crowding in mandibular arch. [Figure 1]

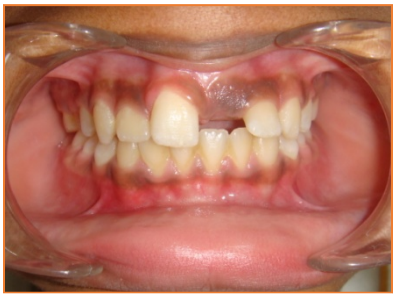

Figure 1: Front Pretreatment

An intraoral periapical radiograph of upper anterior region demonstrated a supernumerary tooth and an impacted permanent maxillary left central incisor. [Figure 2]

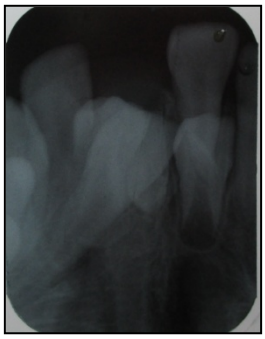

Figure 2: IOPA Pretreatment

To confirm the position of supernumerary tooth, upper anterior occlusal radiograph was taken which showed the presence of supernumerary tooth on the palatal side in relation left maxillary central incisor. [Figure 3]

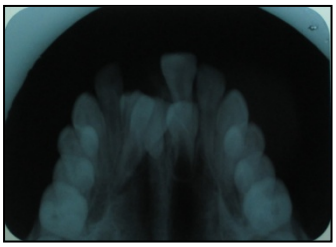

Figure 3: Upper occlusal

The etiology of the maxillary left central incisor impaction could be due to presence of multiple impacted supernumerary teeth palatally.

Treatment alternatives

1. Extraction of the impacted central incisor and restoration with a bridge or an implant.
2. Extraction of the impacted central incisor and closure of the space, substituting the lateral incisor for the central incisor with subsequent prosthetic restoration.
3. Surgical exposure and orthodontic traction of the impacted central incisor into proper position.

After realizing the possible treatment alternatives, the patient agreed for the extraction of supernumerary tooth

surgically followed by surgical exposure of impacted central incisor and alignment of the impacted incisor into the arch by orthodontic treatment.

Treatment objectives

Keeping in mind the treatment alternative chosen the objectives of the treatment are:

1. Surgical extraction of the supernumerary tooth
2. Surgical exposure of the impacted left maxillary permanent central incisor. Orthodontic traction with light forces and space regaining for proper alignment of the impacted incisor in the maxillary arch.
3. Correct the mild mandibular anterior crowding.
4. Establish ideal overbite and overjet.
5. Improve facial esthetics.

Treatment plan

1. Non extraction treatment
2. Levelling and aligning
3. Surgical exposure and orthodontic traction of the impacted central incisor into proper position.
4. Finishing and detailing.

Treatment progress

I. Surgical extraction of the supernumerary tooth:

Initially phase I periodontal therapy was done. With the patient under local anesthesia, a mucoperiosteal flap on the palatal side was raised. After careful elevation of the flap, adequate amount of bone was removed using rotary cutting instruments. The supernumerary tooth was removed surgically and the extraction socket was inspected for any pathological tissue.

II. Surgical exposure of the permanent left central incisor: As suggested by Becker A 1998,[12] surgical exposure can be performed in 3 accepted ways.

a. Circular excision of the oral mucosa immediately overlying the impacted tooth.

b. Apically repositioning of the raised flap that incorporates the attached gingiva overlying the impacted tooth.

c. Closed eruption technique in which the raised flap that incorporates attached gingiva is fully replaced back in its former position after an attachment has been bonded to the impacted tooth.

In this case circular excision of oral mucosa overlying the impacted tooth was carried out and a window was made for the attachment of begg's bracket for traction. [figure 4]

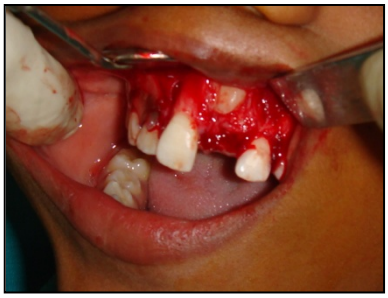

Figure 4: Surgical exposure of Impacted incisor

III. Orthodontic treatment and space regaining for proper alignment of the impacted incisor in the maxillary arch

Molar bands were placed on the maxillary and mandibular first permanent molars and the maxillary and mandibular teeth were bonded with MBT .022 appliance. Initially .018 Australian ss wire was used for the traction of the impacted and then the same wire was used as piggy back wire for traction along with leveling and aligning niti in the upper and lower arch [Figure 5].

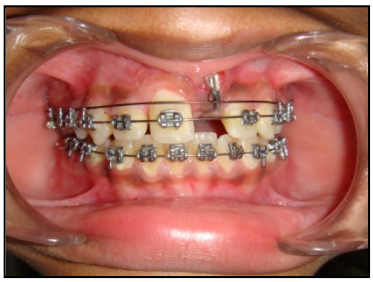

Figure 5: Exposed impacted incisor with initial traction

The traction was continued till the incisor is sufficiently visible in the oral cavity. After the crown of the impacted incisor was sufficiently erupted, it was found that the space available in the arch was not sufficient to accommodate the impacted incisor in the arch. So, it was necessary to regain the space in the maxillary arch. For space regaining Australian S. S. arch wire with open coil spring in position of the left central incisor was used [figure 6].

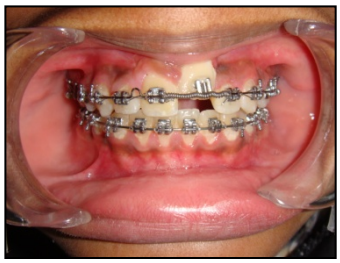

Figure 6: Space regaining with Niti coil spring

By activating the open coil-spring, adequate space for aligning the impacted incisor was obtained. After obtaining the adequate space for alignment of impacted incisor in the maxillary arch, the 0.014" Australian S. S arch wire with an open coil spring was removed. MBT .022 bracket was bonded on the left central incisor and wire placed for the alignment of the incisor.

Treatment results

The impacted permanent maxillary central incisor was successfully aligned in proper position. The exposed incisor after complete treatment presented an acceptable gingival contour and attached gingiva. [Figure 7]

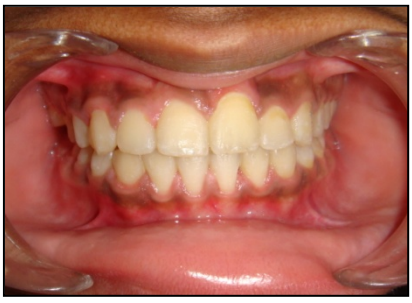

Figure 7: Intraoral front Post debond

Discussion

Supernumerary teeth can affect the normal position and eruption of adjacent teeth and often require clinical intervention [13]. The most common complication due to presence of supernumerary teeth is the failure of eruption of maxillary incisors [14]. In the present case the associated supernumerary tooth was conical, non - inverted and impacted on the palatal side and interfered with the eruption of the permanent tooth.

Methods of management of impacted incisor due to supernumerary tooth are removal of supernumerary teeth or tooth only, removal of supernumerary teeth and bone overlying the impacted teeth, incision of fibrous tissue over the alveolar ridge to promote the eruption with or without orthodontic traction [15,16]. Spontaneous eruption of impacted maxillary incisors occurs in 54-76% of cases when supernumerary tooth is removed and there is enough space in the dental arch. In the present case the root formation was almost complete and because of its labial placement it was not desirable to wait for spontaneous eruption.

After thorough clinical and radiographic examination, it was decided that the present case required a combination approach comprising of both surgical and orthodontic treatment to bring an unerupted maxillary central incisor into its desired position.

Factors considered for successful alignment of an impacted tooth are:

- The position and the direction of impacted tooth.
- The degree of root completion
- The presence of space for the impacted tooth.

These factors were considered before planning treatment for this case. Surgical exposure of the impacted incisor was conservative to allow for the placement of a bonded bracket which is in accordance with the

recommendations given by Samir E. Bishara.[17] Vanarasdall R and Corn H.[18]

The extrusion force applied on the impacted central incisor in the present case was very light and measured in the range of 40-50 grams. In the present case the patient was 12 years old at the time of initiation of the treatment. Forces for traction greater than 50 grams should not be applied as it may be the cause no vitality as reported by Uematsu et al. [19]. In the present case aligned left maxillary incisor remained vital and responded normally to percussion and mobility and sensitivity testing.

Conclusion

Supernumerary teeth may result in the noneruption of adjacent permanent incisors. Early diagnosis of the presence and removal of supernumerary teeth are essential. The case demanded interdisciplinary approach from oral surgeon, orthodontist and periodontist. Surgical exposure and orthodontic correction offer a simplifies treatment for impacted incisors. The advantages include esthetic improvement, use of a single, simplified surgical procedure, simple and short orthodontic therapy and normal gingival margins.

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