Case Report

JRAD Journal of Research and Advancement in Dentistry

J Res Adv Dent 2019;9:2:259-263.

Impacted Maxillary Anteriors – Simple Orthodontic Assisted Forced Eruption & Alignment: A report of two clinical cases

G. Shirisha[1*] J. Sharada[2] K. Suhasini[3] I. Hemachandrika[4] P. Tarasingh[5] Hasanuddin Shaik[6]

[1]PG Student, Department of Pedodontology, Government Dental College, Hyderabad, India.
[2]Professor and Head, Department of Pedodontology, Government Dental College, Hyderabad, India.
[3]Associate Professor, Department of Pedodontology, Government Dental College, Hyderabad, India.
[4]Assistant Professor, Department of Pedodontology, Government Dental College, Hyderabad, India.
[5]Assistant Professor, Department of Pedodontology, Government Dental College, Hyderabad, India.
[6]Assistant Professor, Department of Pedodontology, Government Dental College, Hyderabad, India.

ABSTRACT

Background: Impaction of maxillary anterior teeth is of prime concern in children with developing dentition because of their importance in facial esthetics. Various local causes are responsible for impaction of upper anteriors. Early diagnosis and treatment improves skeletal esthetics, eliminate functional interferences and prevent occlusal disturbances during the eruption of adjacent teeth. Management options for impacted maxillary anteriors include surgical exposure followed by orthodontic correction. The present case reports describe surgical exposure followed by orthodontic treatment of impacted permanent maxillary anteriors in children reported with delayed eruption. The impacted teeth were surgically exposed and brackets were bonded to apply orthodontic extrusive force to bring them into their proper position in the dental arch. Forced eruption and simultaneous alignment of impacted maxillary anteriors by orthodontic movement result in esthetic improvement and functional stability of developing dentition.

Keywords: Delayed eruption, Impacted anteriors, Surgical exposure, Orthodontic traction.

INTRODUCTION

An impacted central incisor is usually diagnosed, when there is a delay in the eruption of the tooth. Supernumerary teeth obstructing the pathway of eruption are the main cause of impaction of upper incisors.[1] Supernumerary teeth are the extra teeth formed due to the disturbances during the initiation and proliferation stages of tooth development.[2,3,4] An interesting case of an impacted supernumerary tooth in the maxillary anterior region, interfering with the eruption of the maxillary permanent central incisors and another case of impacted maxillary left permanent canine with an etiology of failure of eruptive force are presented. Combined surgical and orthodontic treatment employed to bring the impacted maxillary central incisors and left maxillary canine to their proper position in the dental arch is discussed.

CASE REPORT 1

A 12-year old male patient reported with the chief complaint of unerupted upper front teeth. The patient was physically healthy and had no history of dental trauma. Intra-oral examination revealed absence of maxillary permanent central incisors (Fig-1). An occlusal radiograph of upper anterior region demonstrated two impacted supernumerary teeth and impacted maxillary permanent central incisors (Fig-2).

The treatment first comprised of removal of supernumerary teeth under 2% lidocaine with 1:1,00,000 epinephrine by reflecting full thickness muco-periosteal flap. After removal of supernumerary teeth, the muco-periosteal flap was reflected labially and the bone and connective tissue covering the impacted incisors was removed and

Received: Oct. 17, 2018**: Accepted**: Jan. 21, 2019
***Correspondence Dr. G. Shirisha.**
Department of Pedodontology, Government Dental College, Hyderabad, India.
Email: shirisha.guguloth91@gmail.com

pISSN 2278-0076
eISSN 2321-9270

adequate amount of crowns were exposed for bonding of the orthodontic brackets (Fig-3). Orthodontic traction of the impacted incisors was done with a removable appliance containing a long labial bow and retentive hooks on the palatal side. A light force was applied by ¼ inch intra-oral elastics attached to the hooks and the brackets (Fig-4). These elastics were changed on daily basis. After 6 months follow up, the incisors reached the occlusal plane but they were crowded (Fig-5).

Fig 1: Absence of maxillary incisors.

Fig 2: Radiograph showing supernumerary teeth

Fig 3: Brackets bonded on 11, 21

Fig 4: Use of 1/4 inch elastics for retraction.

To relieve the crowding, 2/6 fixed orthodontic system was applied in which molar bands were placed on the right and left maxillary first permanent molars and brackets were placed from left maxillary canine to right maxillary canine.[5] The Australian NITI wire was used to relieve crowding. The crowding was relieved by one year (Fig-6) and the patient was given maxillary Hawley's retainer for retention lasting for 6 months.

Fig 5: Crowding of 11 & 21.

Fig 6: Use of Australian NITI wire to relieve crowding

CASE REPORT 2

A 13yrs old female patient reported with the chief complaint of delayed eruption of upper left canine. She was in good health and had no significant medical history. Intra-oral examination revealed missing maxillary left permanent canine (Fig-7). An Intra-oral periapical radiograph showed impacted maxillary left canine (Fig-8). After obtaining adequate anaesthesia using 2% lidocaine, a full thickness muco-periosteal flap was raised until adequate crown of canine was exposed (Fig-9).

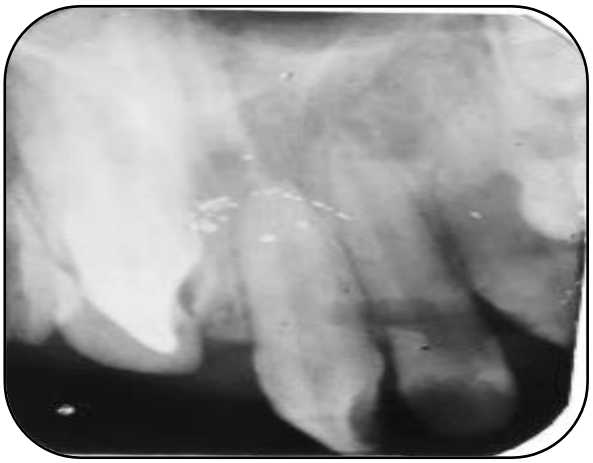

Fig 7: Missing left canine.

Fig 8: IOPA showing impacted canine

Fig 9: Surgical exposure of 23

An orthodontic bracket was bonded to the exposed canine and premolars. The orthodontic traction was done with continuous E-chain from canine to premolars of left side (Fig-10). After 9 months follow up, the canine reached the occlusal plane (Fig-11).

Fig-10: Brackets & "E" chain placed to retract canine.

Fig-11: Proper alignment of canine in arch

DISCUSSION

Impaction is defined as a phenomenon in which a tooth cannot erupt into its functional position.[4] Impacted teeth can cause serious aesthetic difficulties as well as psychological problems especially when present in anterior regions. Although the impaction of maxillary incisor occur less frequently than the impaction of maxillary canine, it is of concern to parents during the early mixed dentition stage because of the unerupted tooth.[6] Various local causes of impaction include odontoma, supernumerary teeth, space loss and disturbances in the eruption path and also trauma and apical follicular cysts.[7,8] In the first case treated here, upper permanent central incisors were obstructed by supernumerary teeth and in the second case it was due to lack of eruptive force.

Impaction of maxillary anterior teeth can be a challenging orthodontic problem. Several reports have indicated that an impacted tooth can be brought into proper alignment in the dental arch.[9-13] The following factors are used to determine whether successful alignment of an impacted tooth can take place: (1) the position and direction of the impacted tooth, (2) the degree of root completion, (3) the degree of dilacerations and (4) the presence of space for the impacted tooth.[10] Holland has recommended the movement of axis of the impacted tooth must be considered together with these factors.[14]

The treatment approach of impacted maxillary teeth requires proper crown exposure surgery and orthodontic traction.

Three accepted ways of surgical exposure have been suggested by Becker (1998)[15] as:

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.

The closed eruption technique has been favoured by many clinicians who claim that the aesthetic and periodontal outcome is far more superior when compared with the circular excision and apically positioned flap technique.[16-18] In the presented cases, the apically positioned flap technique was used as this technique permits ready (immediate) reattachement of bracket if unintended debonding occurs. At the end of the treatment, patient showed normal clinical crown length with acceptable gingival contour.

The extrusion force applied on the impacted central incisor in the present case was very light and this was accounted for the little difference in the clinical crown length and maintenance of vitality of the impacted tooth post-alignment. The chances of nonvitality are naturally much lower when the treatment is initiated at a younger age due to the presence of a wide apical foramen.[19] In the present cases, the duration of treatment was around 8-16 months and the aligned permanent maxillary incisors and left canine remained vital and responded normally to percussion and mobility and sensitivity testing.

CONCLUSION

Obstruction by supernumerary teeth and/or lack of eruptive force may result in the impaction of permanent incisors and canines. Early diagnosis of the presence and removal of supernumerary teeth is essential. Maxillary permanent right incisor and left canine were successfully aligned in the maxillary arch by surgical exposure and orthodontic traction, which showed good stability.

CONFLICT OF INTEREST

No potential academic conflict of interest relevant to the above article was reported.

REFERENCES

1. Smailene D, Sidlauskas A, Bucinskiene J. Impaction of the central maxillary incisor associated with supernumerary teeth: Initial position and spontaneous eruption timing. Somatologiga, Baltic Dental and Maxillofacial Journal 2006; 8(4): 103-7.

2. Mcdonald RE, Avery DR. Dentistry for the child and adolescent. First South Asian edition, CV mosby company, st Louis.2016; p598.

3. Bergstrom K. An orthopantomographic study of hypodontia, supernumeraries and other anomalies in school children between the ages of 8-9 years. An epidemiological study. Swedish Dental Journal 1977;1:145-57.

4. Humerfelt D, Hurlen B, Humerfelt S. Hyperdontia in children below four years of age: A radiographic study. ASDC J Dent. Child. 1985;52:121-4.

5. Sims JM. Minor tooth movement in children. 2nd edition, CV mosby company, st Louis.1977; p191.

6. Cesur MG, Esenlik E, Findiky. Impacted maxillary central incisor associated with Bilateral mesiodens : A case Report. Bio Med. 2014; 6(2):1-5.

7. Bishara SE. Impacted maxillary canines: A review. Am J Orthod Dentofacial Orthop. 1992; 101: 159-63.

8. Koch H, Schwartz O, Klausen B. Indications for surgical removal of supernumerary teeth in the premaxilla. Int J Oral Maxillofac. Surg. 1986; 15: 273-7.

9. Brin I, Zilberman Y, Azaz B. The unerupted maxillary central incisor: review of its etiology and treatment. ASDC J Dent. Child. 1982; 49: 352-5.

10. Lin YT. Treatment of an impacted dilacerated maxillary central incisor. Am J Orthod Dentofacial Orthop. 1999; 115: 406-9.

11. Wasserstein A, Tzur B, Brezniak N. Incomplete canine transposition and maxillary central incisor impaction : A case report. Am J Orthod Dentofacial Orthop. 1997; 111: 635-8.

12. Kolokithas G, Karakasis D. Orthodontic movement of dilacerated maxillary central incisor. Am J Orthod. 1979; 76: 310-4.

13. Tanaka E, Watanabe M, Nagaoka K, Yamaguchi K, Tanne K. Orthodontic traction of an impacted maxillary central incisor. J Clin. Orthod. 2001; 35: 375-80.

14. Holland DJ. The surgical positioning of unerupted, impacted teeth. Oral Surg Oral Med. Oral Pathol.1956; 9: 130-5.

15. Becker A. The orthodontic treatment of impacted teeth. Mosby; 1998. p53-85.

16. Crawford LB. Impacted maxillary central incisor in mixed dentition treatment. Am J Orthod. Dentofac. Orthop. 1997; 112: 1-6.

17. Uematsu S, Uematsu T, Furusawa K, Deguchi T, Kurihara S. Orthodontic treatment of an impacted dilacerated maxillary central incisor combined with surgical exposure and apicoectomy. Angle Orthod. 2004; 74: 132-7.

18. Paola C, Alessandra M, Roberta C. Orthodontic treatment of impacted dilacerated maxillary incisor. J. Clin. Pediatr.Dent. 2005; 30: 93-7.

19. Chawla HS, Kapur A. Orthodontic management of faciolingual horizontally impacted maxillary central incisor. J Indian Soc Pedod Prev Dent. 2009; 27(1): 65-9.