

IMPACTED MAXILLARY CENTRAL INCISORS WITH SUPERNUMERARY TOOTH - CASE REPORT

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SUMMARY

Introduction: Presence mesiodens is not uncommon in clinic practice. It is cause of impacted permanent maxillary central incisors. Diagnosis of the delayed tooth is usually made on the basis of clinical and radiographic findings. The treatment include surgical exposure of the impacted maxillary central incisors and extraction of supernumerary tooth, because it is a direct obstruction for the eruption of maxillary central incisors. Impacted maxillary central incisors is moved into it's proper position with orthodontic traction. The aim is presented surgical-orthodontic treatment of impacted teeth, which is necessary to achieve stability esthetic and functional results.

Case report: This case report describes a surgical-orthodontic treatment of 9.5-old boy with both impacted permanent maxillary central incisors with supernumerary tooth which disturbs their normal eruption.

Conclusion: The gnathometric evaluation of spaces in dental arch, the assessment of dental age and radiographic analysis are preconditions of successful therapy. The impacted maxillary central incisors were successfully positioned in the maxillary arch, with an adequate width of attached gingiva. The careful and persuasive treatment planning of an orthodontist, oral surgeon and periodontist are the key to success in resolving such cases.

Keywords: impaction;maxillary incisors, mesiodens, treatment

SRPSKI

IMPAKTIRANI MAKSILARNI CENTRALNI SEKUTIĆI SA PREKOBROJNIM ZUBOM- PRIKAZ SLUČAJA

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SAŽETAK

Uvod: Prisustvo prekobrojnog zuba mesio-densa nije retka pojava u praksi. Njegovo prisustvo je vrlo često uzrok impakciji maksilarnih sekutića. Njihova dijagnostika je isključivo radiografska. Neophodno je ukloniti hirurški prekobrojni zub koji predstavljaju prepreku na putu nicanja maksilarnim sekutićima, a najčešće je ortodontska terapija nastavak terapije. Cilj je predstaviti da je ortodontsko-hirurška terapija impaktiranih zuba složena kako bi se došli do stabilnih funkcionalnih i estetskih rezultata.

Prikaz slučaja: Opisan je ortodontsko-hirurški tretman dečaka uzrasta 9.5 godina sa impakcijama oba centralna maksilarna sekutića uz prisustvo prekobrojnog zuba koji je ometao njihovo nicanje.

Zaključak: Analiza prostora u zubnom luku, tačna procena dentalnog doba i detaljna radiološka analiza su preduslovi za dobar plan terapije. Maksilarni centralni sekutići su uspešno postavljeni u zubnom luku sa zadovoljavajućom širinom pripojne gingive.Ujedno i hirurško-ortodontsko-parodontološka saradnja su ključ uspeha u rešavanju ovakvih slučajeva.

Ključne reči: impakcija; maksilarni sekutići, mesiodens, terapija

INTRODUCTION

It is often stated that the maxillary central incisor is the third-most commonly impacted tooth after third permanent molars and maxillary canines.[1] Impaction of permanent maxillary incisors occurs in 0,2-1% of the population [2-4], early referral of patients in the mixed dentition is common due to concern of parents and general dentists regarding delayed eruption of the permanent maxillary central incisors. The causes of impaction of maxillary central incisors can be obstructive (supernumerary teeth, odontome, ectopic position of the tooth) and traumatic (obstruction due to soft tissue repair, dilacerations, acute traumatic intrusion, arrested root development). [5] The most common etiological factor is the presence one or more supernumerary teeth or trauma to primary dentition. Mesiodens is supernumerary tooth which is situated between the central incisors. The majority of the mesiodens were unilateral located in the premaxillary region, were conical shaped, and remained unerupted. Supernumerary teeth are commonly observed as an isolated developmental anomaly. While the familial tendency of supernumerary teeth has been documented, its genetic causality has not yet been determined.[6] 56-60% of supernumerary teeth-mesiodens is cause impaction of permanent incisors due to a direct obstruction for the eruption.[7]

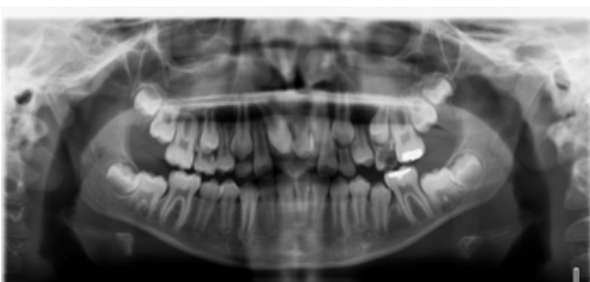
In case, when supernumerary tooth is in midline of maxilla, between permanent central incisors, it don't disturb their eruption. Then, both central incisors and mesiodens can eruption. But, when the supernumerary tooth crosses the midline, it may provide the physical obstacle to the normal eruption of central incisors. Alternatively other physical obstacles, such as above supernumerary teeth, may be the more likely reason for a secondary displacement of these teeth. It may be found one or both impacted maxillary permanent incisors.[8]

An increase in the patient's age or abnormalities in the shape and direction of eruption of supernumerary teeth is associated with complications. These parameters should be considered while formulating the treatment plan.[9] As the majority of unerupted incisors presented with complications, a systematic and organized method of history taking as well as clinical and radiographic examinations is mandatory in the diagnosis.[10] Clinical inspection and palpation of the alveolar process is recommended.[5,11] The choice of surgical method depends of the position of the impacted tooth. The correct choice of the surgical method with orthodontics forced eruption of teeth means more successful aesthetics result.[12-15]

CASE REPORT

This case report describes a surgical-orthodontic treatment of a patient with a both impacted permanent maxillary central incisors with supernumerary tooth which disturbs their normal eruption. Patient was a 9.5 year-old boy in early mixed dentition. The child was physically healthy and had no history of medical and dental trauma. There was 9 months after the extraction of the deciduous maxillary incisors. Intraoral clinical examination revealed a missing maxillary permanent central incisors and erupted permanent lateral maxillary incisors. There was crowding in lower jaw and an Angle's class ½ II molar relationship. Oral hygiene was compromised.

Panoramic imaging revealed the bilaterally impaction of permanent maxillary incisors and supernumerary tooth. It was superimposed on unerupted left central incisor. The incisors were in the level of the apical third of the roots of the erupted maxillary lateral incisors.



[Figure 1] 9.5years old boy. Ortopanoromograph

Gnatometric evaluation showed the following results: the sum of upper incisors was 36mm (macrodontia), the heritage crowding and less width of upper and lower dental arches, the total tooth width of the side segment (CP2) in the upper and lower jaw obtained from Moyers's analysis was less than average.[16]

The dental age of the patients lags behind the chronological age, as witnessed radiographic by less root formation than is to be expected at a given age. Result from Demerjian table for dental age was same as radiographic-a late developing dentition.[17]

For this case was developed 2-stage treatment plan. The first stage included surgical exposure of the impacted central incisors and extraction of supernumerary tooth; in the second stage -orthodontic treatment for alignment maxillary incisors with a fixed orthodontic appliance 4x2.

1. Surgical exposure of impacted central incisors and extraction of supernumerary tooth

At surgery, after careful elevation of the flap, the supernumerary tooth were identified on the palatal side, behind right incisor and extracted to leave empty sockets. A minimal area of the labial surface of the incisors was exposed, without removing surrounding bone. Removal of bone inferior to the incisors would have left a deep defect, by including the socket of the extracted supernumerary tooth.



[Figure 2] 9.5years old boy. Surgical exposure of impacted maxillary central incisors and extraction of supernumerary teeth (mesiodens)

Apically repositioned flap was sutured back. The distance between the maxillary incisors was 8mm, after extraction of mesiodens.



[Figure 3] 9.5years old boy. Two weeks after surgical exposure of impacted maxillary central incisors

We followed up eruption of central maxillary incisors, when they were approaching to occlusal plan the distance was reduced. This distance was 1mm after six month. The left lateral incisor was behind central incisor and middle of upper dental arch was moved on left side.



[Figure 4] 10years old boy. Eruption of maxillary incisors 6 month after surgical exposure and frenectomy, diastema mediana closed

There was inadequate space distribution of the maxillary incisors causing midline deviation. In this case, there was indication for frenectomy. It was done before the orthodontic treatment.[18]

2. Orthodontic treatment

Then orthodontic therapy started with a fixed orthodontic appliance 4x2 in upper and lower jaw and it should be retained until full eruption of the permanent tooth has occurred.



[Figure 5] 10 years old boy. Orthodontic treatment with fixed appliance 4x2

A mixed dentition treatment can effectively be provided using fixed appliances over traditionally used removable appliances.[19]

The fixed orthodontic treatment consisting of brackets on the incisors and bands on the first permanent molars in the upper arch. Direction of force was adjusted occlusally to guide the movement of the central incisors into the correct position. At the end of six months of treatment, the central incisors were in right position in dental arch and midline is corrected. After six month full fixed orthodontic treatment was started, because the maxillary and mandibular arch were not aligned. We distalized the maxillary posterior teeth and correcting the dental Class II relationship. During the therapy, we used a nickel-titanium open-spring for space for left lateral incisor. The therapy continues that will remain leveling for teeth #22 #35 #45.



[Figure 6] 10.4 years old boy. Orthodontic treatment with nickel-titanium open spring for left lateral incisor

No tooth was extracted for getting additional space in arches. The dental age of the patients lags behind the chronological age, and conclusion is that have enough time for developing of jaws and getting space to accommodate all the teeth.[5]

Results: The impacted maxillary central incisors were successfully positioned by getting additional space in the arch. The both central maxillary incisors reached the occlusal plane, stable occlusion was achieved. Although, there was some vertical discrepancy in the gingival height between the right and left central incisors. This fact could be explained that the position of unerupted left incisor was higher than the right incisor. Gingivoplasty is our plan, but now the patient and his parents don't want any further surgery.



[Figure 7] 10.8 years old boy. After 9 months orthodontic therapy, relationship Class I

DISCUSSION

Most impactions are symptomless and aside from maxillary central incisors, do not usually an obviously abnormal appearance. An impacted central incisor is usually diagnosed accurately when there is delay in the eruption of tooth. Because impaction occurs only in the young patients, the orthodontic-surgical solution was chosen. The aim of therapy is traction of the impacted central incisor into proper position.[20]

The prognosis of the result depends on several factors: root length, surgical exposure, type and height of periodontal attachment, oral hygiene and treatment duration.[21,22] Chaushu et al[23] treated 64 impacted incisors with the orthodontic-surgical modality and reported that overall success rate was 90%.

Impacted teeth are often associated with a lack of space in the immediate area. This is frequently due to the drifting of adjacent teeth, although crowding of the dentition in general may be the prime cause. For this facts, it is very important measurement of side segment (CP2) in dental arches from Moyers's analysis.[5,16] The eruptive events may be guided and directed, so that teeth may occupy the space prepared to receive them in the dental arch. Regardless of the position of an unerupted tooth, it may be biologically directed to its place in the dental arch.[24] Treatment initiation with operation in the absence of the required eruption space is not recommended. Space creation followed by surgical removal of any obstruction together with orthodontic traction initiation produces excellent results, while waiting for spontaneous eruption is indicated only in cases of favourable patient's age and tooth location [25].

An incorrectly indicated surgical method can cause some undesirable consequences, as gingival recession, reintrusion of tooth. Surgical management of an impacted tooth is considered the key to achieving desirable esthetic results.

As suggested by Becker A.[26] surgical exposure can be performed in 3 accepted ways: 1.circular excision of the oral mucosa, 2. apically repositioning of the raised flap and 3.closed eruption technique in which the raised flap that incorporates attached gingiva is fully replaced back in it's former position after an attachment has been bonded to the impacted tooth.

It has been suggested and shown that the "window" approach causes statistically significant loss of attachment, recession and gingival inflammation occur on maxillary teeth after surgical exposure. Therefore, a part of keratinized gingiva must be preserved or an apical flap should be used. This approach aims at obtaining keratinized gingiva around the entire erupting tooth. It is important for a tooth to erupt through attached gingival, and not through alveolar mucosa.[1,27,28] In our case, apically repositioning flap was carried out.

Accordingly, motivation for treatment in these cases is minimal and much time has to be spent with the patient before child agrees to treatment.[1,5] The story does not end there, since these patients may often and require periodic talking to maintain their cooperation and the resolve to complete the treatment. That story was same in our case. Patient did not maintain the required standard of oral hygiene and while it is so difficult to justify continuing treatment in this circumstances. His request in the middle of treatment was to remove appliances. Missing motivation of patient and his parents and rare visiting to orthodontist are reasons way this orthodontic treatment isn't finished. Therefore, while ambitious and innovative treatment plans may be suggested, it is essential to take motivation into account before advising lengthy and complicated treatment, since the risk of non-completion may be high. Ideally, examination and treatment planning should be undertaken within a multidisciplinary clinic.

The impacted maxillary central incisors were successfully positioned by getting additional space in the maxillary arch, with an adequate width of attached gingiva. The careful and persuasive treatment planning of an orthodontist, oral surgeon and periodontist, are the key to success in resolving such cases.

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