

Vertical, Intra-Osseous Impaction of Permanent Maxillary Central Incisor in Association with Multiple Anomalies - Report of a Rare Case

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Abstract

Occurrence of supernumerary teeth is the most common dental anomaly which is seen day to day clinical practice. Impaction of the permanent mandibular central incisor is a rare phenomenon usually caused by presence of supernumerary tooth in the midline called mesiodens. The aim of this article is to present a case, in which permanent maxillary right central incisor showed low and vertical level of impaction along with presence of two supernumerary teeth and short root anomaly.

Keywords: *Impaction; Maxillary Incisor; Supernumerary Tooth; Mesiodens; Dental Anomalies*

Introduction

Permanent maxillary central incisors are the front teeth which play a major role in establishing facial aesthetics, proper pronunciation of sounds, helps in chewing and mastication. They usually erupt around 6 to 8 years of child's age and the first tooth to erupt among the permanent dentition beginning the mixed dentition stage or second stage of dentition transmission in an individual [1]. Following the exfoliation of primary incisors when permanent incisors do not erupt into the oral cavity, the both parents and child are anxious about the problem because of unattractive smile which further effects self-esteem and general social interaction of the child. The incidence of unerupted maxillary incisors varies from 0.13 to 2.6% in the children, age ranging from 5 - 12 years old [1]. Hence clinicians frequently come across such type of dental problems during their clinical practice. Therefore, it is essential to diagnose and manage such problem as early as possible.

Although several etiologic factors contribute the non-eruption of maxillary central incisors, supernumerary teeth are the main culprit causing the impaction of these teeth [2,3]. It is reported that 56 - 60% of supernumerary teeth present in the midline give rise to impaction of permanent incisors because of direct obstruction to the eruption pathway of these teeth. Supernumerary teeth may also cause malformations in the root of impacted tooth, displacement of permanent incisor tooth bud, narrowing of the dental arch and tipping of the adjacent teeth towards the place of the impacted tooth [2,3].

Purpose of the Study

The purpose of this article is to present a case of impaction of the maxillary permanent central incisor in association with presence of multiple supernumerary teeth in an Indian 15 year old male patient.

Case Report

A 15 year old male patient reported to a private dental clinic complaining of space in the upper front region and missing of one tooth in the same region and also a presence of extra tooth in the anterior palatal region. Patient gave a past history of exfoliation of milk tooth at the age of 6 years and from almost 8 years the new teeth has not come into the oral cavity. Patient was healthy, moderately built with no any systemic or metabolic disorders or even with syndromic features. On intraoral examination, spacing in the maxillary right central incisor was observed (Figure 1). The left central incisor was labially positioned. One conical shaped supernumerary tooth was erupted palatal to the left central incisor. On further examination, hypoplasia in the crown of mandibular both right and left first molars was observed. Suspecting the impaction of maxillary central incisor and to rule out presence of other anomalies, an orthopantomograph radiograph was advised. Orthopantomograph radiographic examination revealed, presence of two supernumeraries in which one was impacted and located in the midline (Figure 2). The permanent right central incisor was impacted with complete formation of the root growth evident by the apical closure of the root apex. In the eruption path of right central incisor one supernumerary tooth was present and another was located exactly in the midline due to which the left central incisor was labially pushed. On careful observation of both incisors, the roots of these two teeth appeared very short with crown to root ratio equal to same and found with rounded, closed apices (Figure 2). Based on all clinical, radiographic findings and literature evidence this case was diagnosed as non-syndromic, idiopathic impaction of maxillary central incisor in association with two supernumerary teeth and short root anomaly or rhyzomicroly.



Figure 1: Intraoral photograph showing clinically missing maxillary right permanent central incisor. Labially erupted left central incisor and palatally erupted conical mesiodens can be seen.



Figure 2: Orthopantomograph showing impacted maxillary right central incisor along with two supernumerary teeth in the dental midline. One supernumerary tooth is impacted and is intraosseous. Presence of short root anomaly in maxillary both right and left central incisors can be also being seen.

Discussion

Although the prevalence of maxillary central incisor's impaction is comparatively low in contrast to maxillary canines, but its absence makes impactful and challenging for a clinician.

In most of the cases, presence of supernumeraries is the causes for impaction of maxillary central incisors as they interfere with the eruption pathway of incisors [1,4,5]. In 54 - 76% of the cases, spontaneous eruption of impacted maxillary incisors occurs when they are extracted and provided there is enough space for their eruption in the dental arch. It is also stated that, spontaneous eruption of impacted maxillary incisor usually prolongs up to 3 years and sometimes orthodontic traction is required to extrude the impacted tooth to its normal position in the dental arch [4,5]. In contrast to these suggestions some authors have imposed that by eliminating the culprit of the impacted maxillary incisors i.e. by extracting the supernumerary tooth will not cause a spontaneous eruption of the impacted tooth on its own. In such cases, surgical intervention is must to expose the impacted tooth by surrounding hard or soft tissue obstruction and pulling the impacted tooth by orthodontic traction method. Impacted incisors treated by this method may have poor prognosis due to impact on periodontal tissues and poor gingival adaptation around the contour of the moved tooth by extensive surgical procedure happened on the soft tissue and underlying alveolar bone [2,5].

Recently Hui., *et al.* [6] in their cross-sectional study, evaluated 3-dimensional images of unilateral impacted maxillary central incisors among Chinese children using cone-beam computed tomography. Based on the position of the impacted maxillary incisors, they classified into various types such as vertical, cantered, distal, labial, horizontal, inverted, high, middle, low inclined, palatal, vertical and mesial. Based on this classification the impacted incisor was classified as vertical, as the long axis of the impacted central incisor was oriented in a vertical direction. And based on its position with the entire root length of the adjacent incisor, it was classified as high because in the axial plane the crown of the impacted tooth was located in the cervical third of the root of the erupted adjacent tooth.

Smailiene., *et al.* [2] evaluated the influence of the initial vertical position of the impacted maxillary central incisor on spontaneous eruption frequency and timing after surgical removal of the supernumerary tooth. They found from this study that in 63.6% of cases with average age ranging from 9.5 to 10.5 years, impacted maxillary central incisors spontaneously erupted following removal of supernumerary teeth. The average time taken for the spontaneous eruption of impacted incisors following removal of supernumerary teeth was 16.05 years (3 to 30 months). They also showed from their investigation that a statistically significant difference was found for the eruption time and with different initial vertical position of the impacted central incisors. In addition to this, those teeth impacted at the projection level of the apical third of the contralateral completely erupted central incisor [2,7]. The impacted incisors located at the level of the apical third of the adjacent teeth should always be managed by combination of surgical-orthodontic treatment approach, because spontaneous eruption of such highly positioned impacted teeth is unlikely to erupt [7].

Several factors contribute to the spontaneous eruption of impacted maxillary central incisors like sufficient space in the alveolar arch, degree of root formation, and an axial inclination of impacted teeth, initial vertical position of the impacted incisors and its relation to the adjacent roots [7]. The impacted incisors which are close to the alveolar ridge usually erupt spontaneously over the period of six months [2]. Impacted teeth located higher than 2/3 of the adjacent central incisor root, takes approximately 28 months or 2 years for their spontaneous eruption. Therefore, 90% of such impacted teeth at higher position erupt in a wrong position requiring further orthodontic treatment for their alignment. Therefore, most of the tooth eruption anomalies can be avoided by timely diagnosis and initiation of appropriate treatment at the correct age to avoid unwanted sequel. It is stated that 54% of supernumerary teeth diagnosed at the age ranging from 5 - 9 years corresponding to the time of eruption of permanent incisors should start [8,9].

In the present case, a treatment approach combining extraction of supernumerary teeth followed by surgical exposure and orthodontic movement of impacted central incisor was planned. Although the impacted tooth was placed at the gingival 1/3 of the adjacent erupted

tooth root, but its root formation was complete, so spontaneous eruption following removal of two supernumerary teeth is not possible and requires surgical intervention. However, some of the complications arising by this method should be considered before initiating any treatment as the impacted central incisor was having short roots. Reports have shown that the teeth with SRA should be treated with slow and light forces of orthodontic traction as the heavy forces will cause root resorption faster finally leading to tooth mobility and early loss of the tooth [10,11].

Conclusion

Timely diagnosis of dental anomalies is essential for the early detection, diagnosis, planning of treatment in an individual to avoid unwanted complications or sequel arising from dental anomalies. Among the entire specialist, Pediatric dentist play a major role in identifying such anomalies as these specialist see the children right from their infancy.

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