

Management of unerupted dilacerated upper central incisors with compound odontome obstruction along the path of eruption – A case report.

OT Temisanren¹, OJ Eighbobo² and OO Sanu³

Department of Child Oral Health¹, University of Ibadan, Ibadan, Oyo State
Department of Child Dental Health², University of Port Harcourt, Rivers State and
Department of Child Dental Health³, University of Lagos, Lagos State, Nigeria

Abstract

Failure to erupt permanent incisors is not a common feature in the orthodontics clinic. When such a case is encountered, its management could be challenging due to the importance of these teeth to aesthetics especially in the female gender. This is one of the reasons why patient seek orthodontic treatment in our environment. This case report is that of a young junior secondary school girl that presents with a history of unerupted upper right central incisor with a retained upper right primary central incisor despite several years of exfoliation of upper left primary central incisors and eruption of the upper left central incisors into their functional position.

On investigation, the upper right central incisor was found to have dilacerated apical third of its root complicated by the presence of compound odontome in its path of eruption.

The upper right primary central incisor was extracted; the upper right central incisor was surgically exposed and the compound odontome removed. Orthodontic traction technique was used to position the tooth in the arch.

Keywords: *Unerupted central incisors, dilacerations, odontome.*

Résumé

L'absence d'éruption des incisives permanentes n'est pas une caractéristique commune à la clinique d'orthodontie. Quand un tel cas est rencontré, sa gestion pourrait être difficile en raison de l'importance de ces dents pour l'esthétique en particulier dans le sexe féminin, une des raisons pour lesquelles les patients recherchent un traitement orthodontique dans notre environnement. Ce cas rapporté est celui d'une jeune collégienne présentant une histoire d'incisive centrale supérieure non ébréchée avec incisives centrales primaires supérieures conservées malgré plusieurs années d'exfoliation d'incisives centrales primaires supérieures gauche et d'éruption des incisives centrales supérieures gauches dans sa position fonctionnelle.

Lors de l'examen, l'incisive centrale supérieure droite s'est révélé à avoir un tiers apical dilaté de la racine, compliqué par la présence d'odontome composé sur son trajet d'éruption.

L'incisive centrale primaire supérieure droite a été extraite; l'incisive centrale supérieure droite était exposée chirurgicalement et l'odontome composé enlevé. La technique de traction orthodontique a été utilisée pour positionner la dent dans l'arcade.

Mots-clés: *Incisives centrales, non ébréchée, dilacération, odontome*

Introduction

Missing and unerupted maxillary incisors is second to the maxillary canine in prevalence of unerupted tooth in the labial segment of the jaw with a prevalence of about 1.7% in Nigerians and between 1 – 2% in the Americans [1, 2]. An American study considered it to be the most unattractive deviant occlusal trait [3]. It is the third most commonly impacted teeth in Caucasians [4]. The maxillary incisors and canines are also known as the 'social six' and are most exhibited teeth during a smile and speech hence, their position and morphology are important to facial aesthetics and phonetics [5]. Impaction of one or both of the maxillary central incisors is rarely diagnosed during the mixed dentition but is diagnosed when there is a delay in their eruption [6]. Missing upper incisors are regarded as unattractive hence this may have an effect on self-esteem and general social interaction and it is important to detect and manage the problem as early as possible [7, 8]. If untreated early, especially among school children, it could result in low self-esteem, affects academic performance and or even defaults from school.

Supernumerary teeth are the main cause of the impaction of upper incisors [6, 9]. Other factors include: fibrous tissue bands, non-vital or ankylosed primary teeth, space loss, odontomes and dilacerations of root [5, 10]. Root dilaceration refers to a dental anomaly characterized by an abrupt deviation in the longitudinal axis of the tooth. It can

be localized in the crown; between the crown and the root or most frequently in the root. The dilaceration of a tooth is almost always associated with a history of trauma [10].

This report describes an impacted upper right central incisor with a dilacerated root complicated by a compound odontome and retained primary upper right central incisors in the path of its eruption. The dilacerations most likely was caused by a traumatic dental injury at an earlier age as suggested by the history given. The condition was managed through a multidisciplinary approach.

Case report

This is a case of a 13year old girl Miss 'A' who reported with a complaint of retained upper right primary central incisor. She gave a history of trauma (fall) to the face associated with bleeding gum at about age 5years which was managed at a neighborhood clinic. No history of pain, swelling or associated discomfort was observed.

On examination, she has the complement of teeth for her age except for the absence of the upper right central incisors and the presence of a retained primary upper right central incisor. There was no bulge palpable in the maxillary vestibular area of the mouth. An intra-oral periapical and standard upper occlusal radiograph was taken in the absence of an orthopantomogram (panoramic) view to ascertain the presence or absence and position of the upper right central incisors. The radiographs revealed the presence of the upper right central incisors which was found to be dilacerated and located high up, with the dilacerated distal portion (apical third of the root) in close proximity with the floor of the nose notching it. Between the root of the retained primary upper right incisors and the crown of the dilacerated upper right incisors were multiples of calcified teeth – like structures resembling 'odontomes'. The radiographic examinations also revealed that the crown of the dilacerated upper right central incisor was directed labially and embedded deep in the bone (Figure 1.2).

She was planned for the extraction of the retained primary upper right incisors, removal of the odontomes and the surgical exposure of the crown of the unerupted dilacerated upper right central incisor by closed flap technique for orthodontics attachment and subsequent traction. An incision was made to include two teeth on either side and a labial flap was raised under local anesthesia. The retained primary upper right central incisor was extracted and some bone removed from the cortical bone plate to expose the multiple odontomes which were all

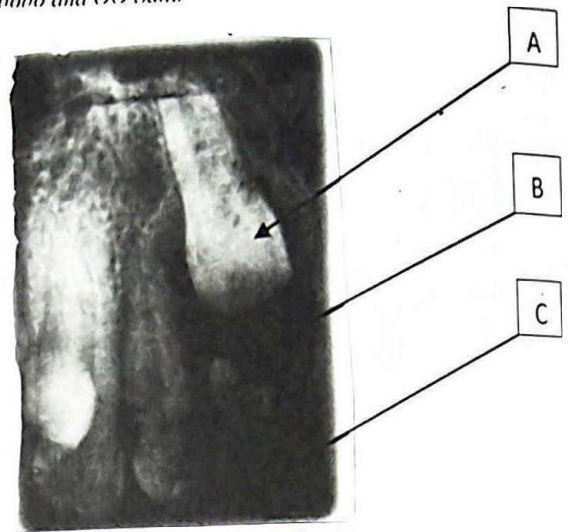


Fig. 1: Periapical radiograph showing;
 (a) Unerupted dilacerated upper right central incisor,
 (b) Multiple odontomes and
 (c) Root of retained primary upper right incisor.

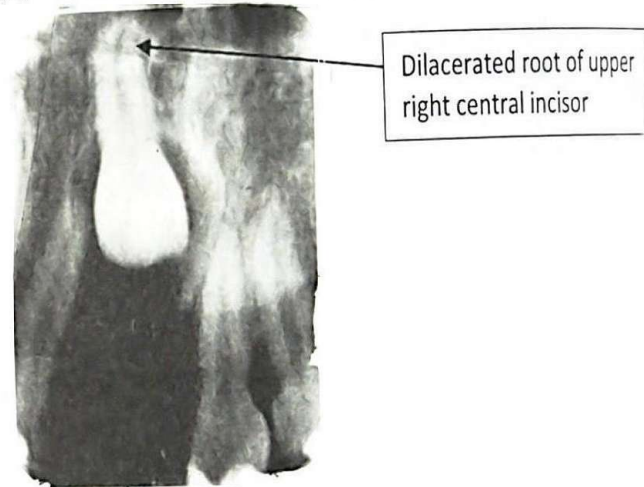


Fig. 2: Periapical radiograph showing Unerupted dilacerated upper right central incisors post extraction of the multiple odontomes and retained primary upper right incisors



Fig. 3. The piece of odontome removed at surgery

removed (Figure 3). The labial crown surface of the dilacerated tooth was made visible through another small window in the labial cortical plate about 8mm higher up. On the exposed part of the crown, an orthodontics button with twisted ligature wire attached to it was placed with the aid of 'Reliance orthodontic light bond following the manufacturer

procedure. The flap raised was then replaced back (close eruption technique) into position using black silk suture 3.0 materials to promote primary healing with the ligature wire projecting into the oral cavity. The healing was uneventful and sutures were removed after one week.



Fig. 4: Periapical radiograph showing: Unerupted dilacerated upper right central incisors following orthodontic traction

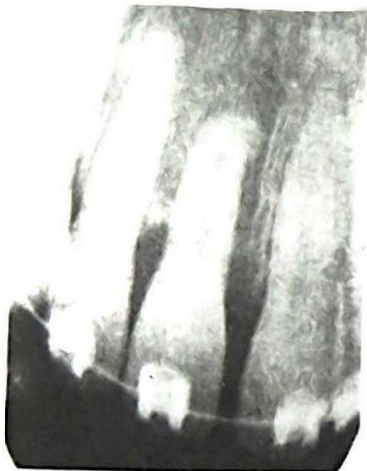


Fig.5: Periapical radiograph showing: Unerupted Dilacerated upper right central incisors in functional occlusion

A complete upper arch only setup was done with straight wire appliance using Lancer orthodontics Redi-Pak prescription kit. At the stage of 0.020 in. round stainless steel arch wire an 0.010 in. open coil spring was placed to regain adequately the lost space and create enough space for the unerupted dilacerated upper right central incisor. The midline diastema present was used to achieve this. With a centrally placed coiled loop incorporated on the 0.020 in. stainless steel arch wire around the edentulous space, a controlled and direct force of traction was made with the aid of an orthodontic elastic thread to bring the unerupted dilacerated tooth into occlusion in the mouth (figure 4). The patient was reviewed every six (6) weeks and the orthodontic elastic thread changed regularly. The unerupted

dilacerated upper right central incisor was found to erupt into the mouth in seventeen (17) months following the initial orthodontic traction (figure 5, 6). The tooth was properly aligned and leveled at its functional position with adequate torque and angulations using the rectangular arch wire 0.019×0.025 in. stainless steel wire. Also, a good gingival margin compared to the adjacent teeth was ensured



Fig. 6: Intra oral photograph of upper right central incisors just about erupting

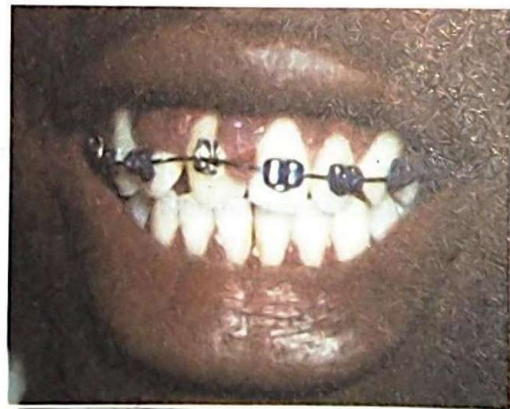


Fig. 7: Intra oral photograph of upper right central incisor in occlusion

The patient was overjoyed with the treatment outcome but was lost to follow up and the eventual debonding and placement of a retainer was not possible as all efforts to recall her proved futile. She was originally planned for gingival contouring of hyperplastic gingival and combined fixed retainer (palatally from the upper right canine to the upper left canine) and removable Hawleys retainer to prevent any form of relapse of the malocclusion and monitored for a period of twelve months before being eventually discharged (Figure 7).

Discussion

The occurrence of unerupted maxillary incisors brings concerns to the parents and patient in the early mixed dentition because of the conspicuous position of the teeth. [11]. Delay in the eruption of the maxillary

incisors requires monitoring especially in a situation where the contralateral maxillary incisor had erupted more than six months earlier or in a situation where both maxillary incisors are yet to erupt more than one year after the eruption of the lower incisors [5, 8].

Several treatment options have been offered by different authors in literature for the treatment of unerupted maxillary central incisors. Very few studies have reported the management of severely dilacerated maxillary incisors and this could be due to the attendant difficulty in its management [10]. Extraction of such a tooth is usually the last option as a loss of alveolar bone is anticipated [12]. Close flap technique with orthodontic traction is a more favourable technique that is commonly adopted [5].

The success rate of an unerupted dilacerated tooth depends on early diagnosis [5], the degree of dilaceration, stage of root formation and tooth vertical position of the tooth [10, 11]. Successful treatment of an impacted maxillary incisor with severe dilacerations is quite rare. Hence, orthodontists will often hesitate to align an impacted incisor with a severely dilacerated root due to failure from ankylosis, external root resorption, and root exposure after orthodontic tooth movement [10, 11].

Often the position or location of the impacted incisor determines the surgical procedure used [8]. The exact position of the tooth is usually determined following investigations with radiographs. Though the panoramic radiograph is considered the standard radiographic first step examination. In this case report, due to the unavailability of the panoramic view, the parallax method in which case two (2) periapical radiographs are taken at two different radiation cone beam angulations was adopted to localize the tooth position. Other methods that can also be used include a periapical radiograph combined with a standard occlusal radiograph of the jaw and a periapical radiograph combined with a panoramic (orthopantomogram) radiograph. All these combinations of radiographs are all in a view of locating the object (incisors) in 3 dimensions. The 3 dimensions technologies such as computertomogram scan (CT scan) and Magnetic Resonance Imaging (MRI) are better investigatory tools for such anomaly. Gradually, these technologies are being introduced into dental practices especially in the western world. Due to cost, it could not be used in our environment.

The common surgical techniques used in orthodontic traction of unerupted tooth include the closed flap technique and the apically reposition flap technique. Two different studies suggested that the closed technique resulted in a more aesthetically

pleasing gingiva than the apically repositioned flap [8, 13]. Therefore, this technique was adopted in this case. Superior results have also been reported in terms of gingival, periodontal and pulp status using the closed eruption technique in comparison with the apically repositioned flap. However, there was no significant difference between the techniques regarding periodontal attachment [13].

Trauma to the primary teeth may have various implications such as enamel hypoplasia and dilaceration. The latter has been found to be far more common, with maxillary teeth being more frequently involved than mandible [14, 15]. So, it is advisable to keep these patients under observation after trauma and to consult an orthodontist at an early stage in case of non-eruption of teeth. The reason for this is that early orthodontic intervention has been found to result in very good outcome with respect to the occlusion of the patient as it was seen in this present case. The timing of intervention is also important, with treatment and tooth eruption likely to be quicker at a younger age. However, some other studies have suggested that age of intervention has no effect. [8]

Also, it should be noted that it is not in all cases of dilaceration of apical third of the root of the unerupted incisors that apicectomy and retrograde root filling combined with subsequent orthograde filling of the tooth are required. In this case presentation, orthodontic traction alone following the removal of the obstructive odontome from the path of eruption using the close flap technique was enough to bring the impacted dilacerated central incisors from its high position around the floor of the nasal cavity into proper occlusion, good and pleasing aesthetics with good periodontal health. Hence, each case should be carefully chosen and required technique for management based on its own merit.

Conclusion

Timing and approach are factors that play important role in the orthodontic management of the unerupted maxillary incisors. Hence, a child involved in trauma should be well investigated and followed up to rule out any possibility of complications to the trauma. If and when diagnosis is made early enough, the timing and prognosis of treatment remains good if the position of the unerupted tooth is favourable.

The unerupted dilacerated incisor with a favourable path of eruption and adequate space on the arch diagnosed in the early mixed dentition should be treated with the aid of orthodontic traction alone as achieved in this case report. The patients should not be put through unnecessary over treatment that may eventually affect the quality of life in one form or the other.

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