



Multidisciplinary Approach in Management of a Rare Case with Multiple Supernumerary Teeth

Dima A Akkielah^{1*}, Reem R AL Natsha² and Fouad S Salama³

¹Dental Resident, SFH Hospital, Riyadh, KSA

²Pediatric Dentistry Consultant, SFH Hospital, Riyadh, KSA

³Professor, Pediatric Dentistry, Department of Pediatric Dentistry and Orthodontics, College of Dentistry, King Saud University, Riyadh, Saudi Arabia

*Corresponding Author: Dima A Akkielah, Dental Resident, SFH Hospital, Riyadh, KSA.

Received: February 01, 2018; Published: February 10, 2018

Abstract

Presence of multiple supernumerary teeth in patients without any associated syndrome or systemic disorder is a rare phenomenon with a prevalence of 1%. Presence of supernumerary teeth in itself is not a problem and may not require removal in all cases but in certain conditions, they may be associated with several clinical complications and require removal. We are reporting a 10-year-old boy who complained of dental pain and none eruption of permanent teeth. Orthopantomogram initially showed presence of multiple impacted supernumerary teeth, but later, cone-beam computed tomography further revealed additional supernumerary teeth. Consultation with concerned pediatrician ruled out any syndromes or systemic disorders which led us to the diagnosis of “non-syndromic multiple supernumerary teeth” and this probably is a high number of supernumerary teeth reported in a single non-syndromic patient. The aim of this report is to document a case of non-familial occurrence of non-syndromic multiple supernumerary teeth and to discuss the multidisciplinary treatment modalities.

Keywords: Multiple Supernumerary Teeth; Non-Syndromic; Surgical Management; Cone-Beam Computed Tomography

Introduction

Hyperdontia is the condition of having supernumerary tooth, or teeth, which appear in addition to the regular number of teeth. It is a developmental anomaly and has been argued to arise from multiple etiologies [1,2]. The most common site is the maxillary incisor region; but the prevalence of more than three teeth supernumerary tooth is less than 1% [1,2]. It was reported that approximately 76 - 86% of cases represent single tooth hyperdontia, with two supernumerary teeth noted in 12 - 23% and three or more extra teeth noted in less than 1% of the cases [1]. Presence of multiple supernumerary teeth in patients without any associated syndrome or systemic disorder is a rare phenomenon with a prevalence of 1% [1,2]. Non-syndromic isolated impacted supernumerary teeth are common compared to the rare occurrence of the supernumerary teeth associated with several syndromes [3-6]. Multiple supernumerary teeth are associated with many syndromes with varying degree such as cleidocranial dysplasia, Gardner's syndrome, Apert syndrome, Downs syndrome, Crouzon disease, Fabry Anderson's syndrome, Ehlers-Danlos syndrome, Incontinentia pigmenti, and Trico-Rhino-Phalangeal syndrome [1-6].

Alarming signs that should alert a clinician to the possible presence of supernumerary teeth include unilateral persistence of a primary tooth, failure of eruption or ectopic eruption of a permanent tooth, a wide midline diastema or interdental spacing, or rotation of erupted permanent tooth [6,7]. However, it is rare to find multiple supernumeraries in individuals with no other associated disease or syndrome [2,3]. In such cases, the maxillary anterior region is the common site of occurrence [8].

The exact etiology of supernumerary teeth is still obscure although many theories have been proposed [9-12]. The supernumerary teeth result from any disturbance in the initiation and proliferation stages of odontogenesis [9,10]. One popularly accepted theory is the dichotomy theory of tooth germs stating that the tooth bud splits into two equal or different sized parts, resulting in two teeth of equal size or one normal and one dysmorphic tooth [9,10]. The other popularly accepted theory is the localized and independent hyperactivity of dental lamina which suggests that supernumerary teeth are formed as a result of local, independent, conditioned hyperactivity of dental lamina [9,10]. Several researchers have also proposed that multiple supernumerary teeth

are a part of post permanent dentition [9-12]. The exact mode of inheritance of supernumerary teeth has not been established; however, genetics is considered to contribute to the development of supernumerary teeth, as these have been diagnosed in twins, siblings and sequential generations of a family [9-12].

Classification of supernumerary teeth may be on the basis of position or form [13,14]. Positional variations include mesiodens, paramolars, distomolars and parapremolars [13,14]. Variations in form consist of conical types, tuberculate types, supplemental teeth, and odontomes [13,14]. Supernumerary teeth may, therefore, vary from a simple odontome, through a conical or tuberculate tooth to a supplemental tooth which closely resembles a normal tooth [13-15]. Moreover, the site and number of supernumeraries can vary greatly [13-16]. It was reported that the common complications with the supernumerary teeth include impaction of adjacent teeth, crowding, diastema formation, rotation, displacement of teeth, occlusal interference, caries, periodontal problems, difficulty in mastication, and compromised aesthetic [6]. The aim of this report is to document a case of non-familial occurrence of non-syndromic multiple supernumerary teeth and to discuss the multidisciplinary treatment modalities.

Case Report

A 10-year-old boy was referred to the pediatric dental clinic to address his complain of pain in all molars on chewing as well as the presence of a retained primary maxillary left central incisor. Routine clinical showed carious teeth with different severity (Figure 1). Radiographic examination with bitewing and orthopantomogram showed the presence of multiple supernumerary teeth (Figure 2 and 3). Further radiographic investigations were requested to clarify the number and position of the supernumerary teeth with maxillary occlusal radiograph and cone-beam computed tomography (Figure 4 and 5) which revealed the presence of four supernumerary teeth preventing the eruption of the maxillary left central incisor and displacement of the maxillary left permanent lateral incisor. Treatment plan was finalized after consultation with oral and maxillofacial and orthodontist consultants.

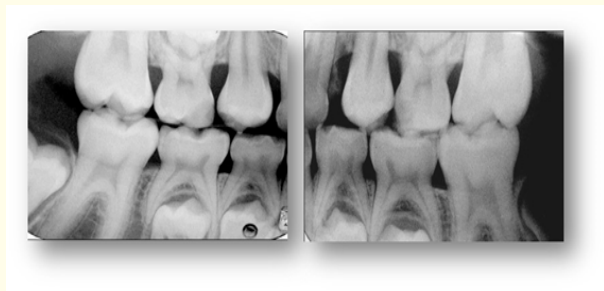


Figure 2: Pretreatment bitewing radiograph.



Figure 3: Pretreatment orthopantomogram.

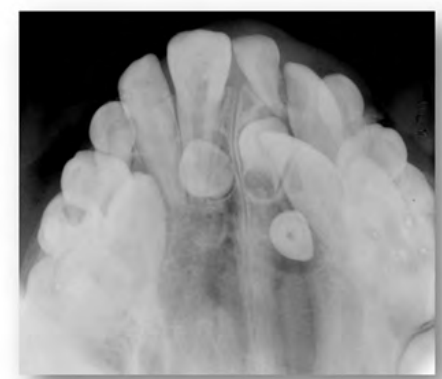


Figure 4: Pretreatment occlusal radiograph.



Figure 1: Pretreatment intraoral photographs.

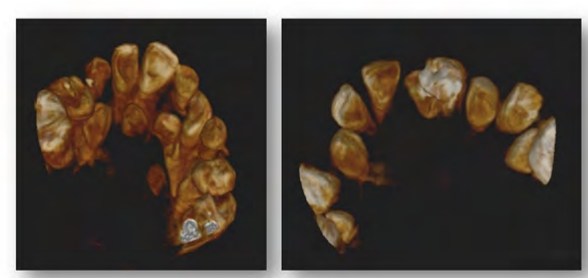


Figure 5: Pretreatment cone-beam computed tomography.

Oral and maxillofacial consultation recommended that surgical removal of retained maxillary left central incisor and the four supernumerary teeth under general anesthesia as soon as possible to avoid impaction of the maxillary left central incisor. In addition, orthodontic consultation recommended surgical exposure of maxillary left central incisor with a closed eruption flap and extrusion of the tooth with bracket and gold chain connected to maxillary modified Nance appliance.

After completion of all needed restorations, all investigations including laboratory blood tests and pre-anesthesia evaluation were completed. Under general anesthesia, palatal flap was raised to localize the position of the supernumerary teeth as they are in close proximity to the permanent teeth. All supernumerary teeth were removed after removal of the maxillary left primary incisor. Figure 6 shows surgical procedures. Maxillary left central incisor was exposed by a closed apical flap. Bracket with gold chain was cemented to the maxillary left central incisor with chain tied to the maxillary right central incisor by ligature wire. After ten days, sutures were removed during the follow-up appointment. Modified Nance appliance was cemented, and the chain was connected to the appliance immediately and later another Nance appliance was constructed. Figure 7 shows surgical exposure of maxillary left central incisor and connection of the chain to Nance appliance. After five months, orthodontic consultation noticed unexpected loss of space for maxillary left central incisor due to mesial drifting of maxillary right central incisor and mesial eruption of maxillary left lateral incisor with crossbite of maxillary left lateral incisor and maxillary left primary canine. Maxillary rapid maxillary expander with hyrax screw was placed to expand the maxilla and create space for maxillary left central and lateral incisors and it was activated two turns per day. The chain was connected to the maxillary rapid maxillary expander. Figure 8 shows connection of the chain to the maxillary rapid maxillary expander. Expansion for two weeks was completed until correction of the crossbite was achieved and enough space for maxillary left central and lateral incisors was restored. The screw was stabilized by ligature wire and kept as retainer. After eight months, the tooth erupted in a palatal position. Patient was followed on a regular recall. A recall follow-up visit of the patient at 13-year-old showed eruption of all permanent teeth (Figure 9).

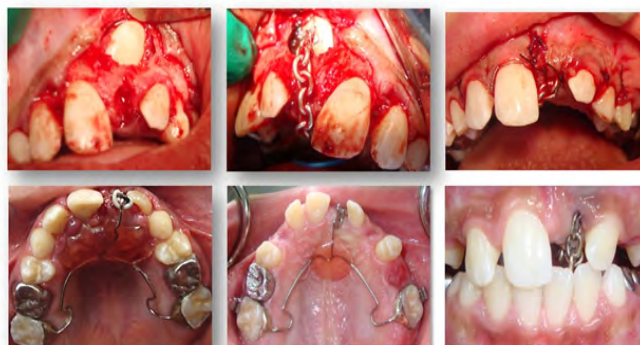


Figure 7: Surgical exposure of maxillary left central incisor and connection of the chain to Nance appliance.



Figure 8: Connection of the chain to the maxillary rapid maxillary expander.



Figure 9: A recall follow-up visit of the patient at 13-year-old showed eruption of all permanent teeth.

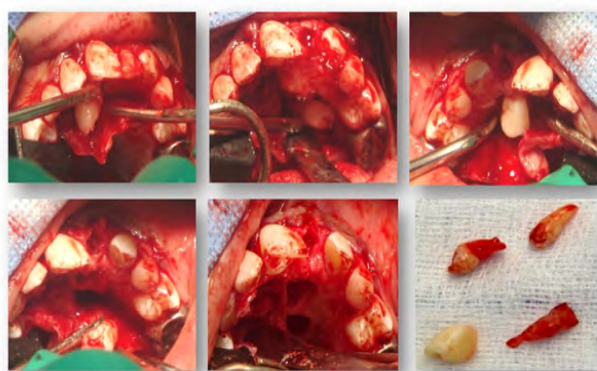


Figure 6: Surgical procedures of all supernumerary teeth and the maxillary left primary incisor.

Discussion

An extensive review of non-syndromic multiple supernumerary teeth for 13 patients with total of 55 supernumerary teeth reported their incidence to be 50.9% in mandible and 49.1% in maxilla [7]. The authors defined multiple as the presence of three or more supernumerary teeth in a single patient, taking in consideration the fact that cases of three or more non-syndromic supernumerary teeth constituted less than 1% of published literature and that a number of authors have followed the same criteria [7]. This is in contrast to another report who considered five or more than five teeth as the criteria [2]. In the present case, we reported presence of four supernumerary teeth.

In the present case, a maxillary rapid maxillary expander with hyrax screw was placed to expand the maxilla and create space for maxillary left central and lateral incisors. We did not use edge-wise orthodontic treatment as it will tip the crowns of maxillary left central and lateral incisors mesially so the roots will tip distally pressing on the unerupted canines causing root resorption in the maxillary left central and lateral incisors [17-19]. Impaction of permanent incisors due to presence of supernumerary teeth is a rare entity encountered in the clinical practice [6]. Similarly in the present clinical case the permanent left central incisor was found impacted due to the presence of the multiple supernumerary teeth. Therefore, thorough clinical and radiographic examination should be performed when alarming signs that alert a clinician to the possible presence of supernumerary teeth are seen [18,19]. In this case report, further radiographic investigations were requested to clarify the number and position of the supernumerary teeth including maxillary occlusal radiographs and cone-beam computed tomography which revealed the presence of four supernumerary teeth preventing the eruption of the maxillary left central incisor and displacement of the maxillary left permanent lateral incisor similar to other reports [17,20]. The cone-beam computed tomography was critical in proper diagnosis and indicated a clear view and locations of the supernumerary teeth. In this case the oral and maxillofacial consultation recommended that surgical removal of retained maxillary left central incisor and the four supernumerary teeth under general anesthesia as soon as possible to avoid impaction of the maxillary left central incisor similar to other reports [19,20]. In addition in this case, the consultation of the orthodontist recommended surgical exposure of maxillary left central incisor with closed eruption flap and extrusion of the tooth with bracket and gold chain connected to maxillary modified Nance appliance similar to other reports [17,19,20].

It was reported that mesiodens is more in male with a ratio of 2 or 3: 1 [21,22]. The mean age for the diagnosis of mesiodens was 8.9 years and were more frequently located on the left side of the midline and none at the midline [21]. Majority of mesiodens were reported to be in a normal direction (91%), while 6% in an inverted direction and 3% in the horizontal direction [21]. Several complications of mesiodens were reported including midline diastema, axial rotation or inclination of erupted permanent incisors, resorption of roots of adjacent teeth, root anomaly, cyst formation, intraoral infection, and the main complication was the delayed eruption of permanent incisors (38.8%) [6,7]. In addition, 55.2% of mesiodens were found to be in a vertical position, 37.6% in inverted position and 7% in horizontal position [6]. In general the common complications of the supernumerary teeth include impaction of adjacent teeth, crowding, diastema formation, rotation, displacement of teeth, occlusal interference, caries, periodontal problems, difficulty in mastication, and compromised aesthetic [14,15,23].

Two treatment options were reported for delayed eruption of adjacent teeth due to the presence of supernumerary teeth including removal of only the supernumerary tooth if adequate space is available for the tooth which still having the potential to erupt or the removal of supernumerary tooth followed by a surgical-orthodontic treatment to re-establish space for the delayed tooth

[13]. The timing of surgical removal of the supernumerary teeth is argumentative and two alternatives exist. First, to remove the supernumerary tooth as soon as it has been diagnosed and second, to leave the supernumerary tooth as such until the root development of adjacent teeth is complete in order to prevent damage to their root apices [10,24]. However, no evidence of root resorption, loss of vitality or any disturbance to root development has been reported during surgical removal of the supernumerary teeth [25,26]. In the present case, surgical extraction of supernumerary teeth was made as soon as it was diagnosed, without any damage to adjacent teeth. Followed by extrusion of the maxillary left central incisor and the patient was monitored at regular intervals for the spontaneous eruption of permanent maxillary right central incisor. Spontaneous eruption of the delayed tooth following the removal of supernumerary tooth is reported to occur in 54 - 75% of the cases and within 16 - 18 months [16,27]. Early diagnosis and proper treatment planning for such uncommon cases are necessary to avoid further complication. Many supernumerary teeth never erupt, but they may delay eruption of nearby teeth or cause impaction of the permanent teeth [6].

In non-syndromic patients, the multiple supernumerary teeth are more frequently found in the premolar region. However, in our case report, all the four supernumerary teeth were present in the incisor and premolar areas. It has been suggested that spontaneous eruption of impacted maxillary incisor has an advantage over its surgical-orthodontic treatment [27,28]. It was reported that the spontaneous eruption of impacted maxillary incisor may take up to 3 years and sometimes orthodontic treatment is necessary to achieve adequate alignment of the erupted tooth in the dental arch [26]. If the root of the impacted tooth is still developing, the tooth may erupt normally; but, once the root apex has closed, as in our case, the tooth has lost its potential to erupt. The absence of any syndrome does not rule out the presence of multiple supernumerary tooth [26].

Conclusion

This case report discusses the clinical and radiographic details along with treatment options and the type of treatment provided to a patient with non-syndromic multiple supernumerary teeth. Multidisciplinary approach included restorations, surgical removal of multiple supernumerary teeth, orthodontic extrusion of the permanent maxillary left central, expansion of maxillary arch. Early diagnosis and intervention with proper treatment planning for such uncommon cases are necessary to avoid further complications. Multidisciplinary approach is very critical to achieve the goal of the treatment planning. The cone-beam computed tomography is a very useful tool in diagnosis and assessing locations of the supernumerary teeth.

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Volume 2 Issue 3 March 2018

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