Double teeth in the primary dentition: case reports from a Nigerian Tertiary Hospital

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Abstract

The term double tooth is used to describe the developmental dental abnormalities called gemination and fusion. Gemination is an attempted, incomplete division of a single tooth germ during the proliferation stage of odontogenesis, while fusion is the union of two or more independently developing teeth. Although the prevalence of primary double teeth is low, double teeth are of clinical interests because of the associated clinical problems. The clinical problems associated with the condition in the primary dentition are often downplayed for various reasons in spite of their importance. Primary double teeth ought to be carefully investigated so that these clinical problems which may affect the permanent dentition can be effectively managed. Perhaps primary double teeth have not received adequate documentation in our environment because of the low prevalence. This paper presents four primary double teeth in three patients. One of the cases presented occurred bilaterally, a relatively uncommon phenomena. The associated clinical problems are illustrated in the cases and the management discussed. Although primary double teeth are asymptomatic and in some cases may not interfere with function, they do have associated clinical problems. Early diagnosis and regular clinical and radiographic observations are necessary for effective management and appropriate treatment of the anomaly.

Key words: Double teeth, Primary dentition, Clinical significance

Introduction

The term double tooth is used to describe connate tooth called gemination and fusion. Other synonyms include 'double formations', 'fused teeth', and 'joined teeth' and they all suggest the conjoining of one tooth with another[1, 2]. Fusion is a partial or complete union of two or more separate tooth germs during odontogenesis, while gemination is an attempt by a single tooth germ to divide[3-6].

The term double tooth seems more appropriate for both conditions because of the difficulty often experienced in differentiating the two conditions clinically[3]. Differentiation can often be made by the use of radiographs. Double tooth was classified into four morphological types by Aguilo et al, using both the clinical and radiographic appearance as the criteria and guide[7]. Type I has single bifid crown, a larger than normal crown with a notch on the incisal edge, a bifid pulp chamber, normal sized root and radicular canal with a widening in the cervical portion. Type II has a large crown and large root; a larger than normal crown usually with no groove or notch, a single large pulp chamber, a root that is larger than normal along all its length and one large shared root canal. Type III has two fused crowns, double conical root while Type IV has fused crown, two fused roots, two (or more) clearly distinct but joined roots with two separate canals[7].

Double teeth usually present unilaterally involving one tooth or two adjacent teeth in the anterior region although bilateral and contiguous presentations have also been reported. Double teeth present in both jaws and there is no predilection for gender[1, 3, 6, 8].

The aetiology of double teeth is not known but has been attributed to evolution, environmental factors, trauma and heredity. The strong evidence for genetic control is evidenced in family and twin studies[6, 9-11]. The pathogenesis of double teeth is not entirely clear either. However, partial division of a single tooth germ, partial fusion of two adjacent tooth germs, or failure of two adjacent tooth germs to separate have been suggested[1-11].

The prevalence of primary double teeth in various populations is 0.5% to2.5%[1,2,3,12]. The prevalence is reportedly low in Caucasians. In Benin City, Nigeria, the prevalence of double teeth was reported to be 0.53 %[12]. In spite of the seemingly low prevalence of double teeth in our environment, they are of clinical interest because of the problems associated with them. Due to the low prevalence of the condition and the carefree attitude of the populace towards the primary dentition, being temporary in humans, there is the tendency to underestimate the importance of these anomalies. Perhaps this low prevalence is also responsible for the rare reporting of the condition in our environment[12].

This paper reports four primary double teeth in three patients, one case being a bilateral presentation which is even more uncommon. The associated clinical problems are illustrated in the cases and the management discussed.

Case reports

Case 1

A healthy four year-old boy presented for routine check-up in the Paediatric Dental Clinic of the Lagos University Teaching Hospital. The child had presented in the clinic at the age of 3 weeks for management of a natal tooth in the mandibular anterior region. His mother was counseled about the preservation of the natal tooth which was relatively firm. Thus, the tooth was not extracted, and the child had been in our care since then.

Intraoral examination of the child, now 4 years old, revealed the presence of double teeth (82) adjacent to the natal tooth (81).The full complement of the primary dentition was present **(Figure 1).** His oral hygiene was fair. The family history by his mother confirmed that one of the siblings also had double primary teeth which were not managed by any dentist. The sibling is now in his permanent dentition stage. History to any familial tendency to natal teeth was negative.

Periapical and panoramic radiographs showed fused teeth with two distinct pulp chambers, two roots and two root canals. The natal tooth was fully developed and part of the normal series of the primary dentition **(Figures 2 and 3).** A diagnosis of fusion of mandibular right primary lateral incisor with a supernumerary tooth in association with natal tooth was made. Prophylactic oral hygiene treatment was carried out and the vertical groove on the double teeth was sealed with composite to prevent dental caries. Oral hygiene instruction and dietary counseling was given to both mother and child. The child is being for monitored closely through tooth exchange until establishment of the permanent dentition.

Figure 1. Case 1: Fusion of mandibular right lateral incisor with a supernumerary tooth.

Case 2

This is a case of an 18 month old baby girl who presented in the Dental Clinic at LUTH with complain of double teeth by her mother. There was no significant medical history, neither was there any positive family history. On clinical examination, there was bilateral double teeth in the maxillary arch **(Figure 4).** There was fusion of the maxillary left central and lateral incisors and gemination of the maxillary right central incisor. Her oral hygiene was fair and her immunisation status was up to date. Periapical radiographs revealed two crowns, two clearly distinct but joined roots, with separate root canals in the maxillary left central and lateral incisors while the maxillary right central showed one root with a single pulp chamber **(Figure 5)**. Furthermore, the presence of the succedaneous maxillary right central and lateral, the maxillary left central, were seen on radiographs while the permanent maxillary left lateral incisor was missing. A diagnosis of gemination of the maxillary right central incisor and fusion of the maxillary left central and lateral incisors and aplasia of the permanent maxillary left lateral incisor was made. Scaling and polishing was done for the child and the maxillary left double teeth were fissure sealed with composite. Oral hygiene instruction and dietary counseling were also emphasized to the mother and regular check-up and follow up is on going with close monitoring against other possible clinical problems that may arise.

Figure 2. Case 1: Periapical radiograph illustrating mandibular primary double tooth showing two crowns, two pulp canals which are shared in the coronal and radicular portion

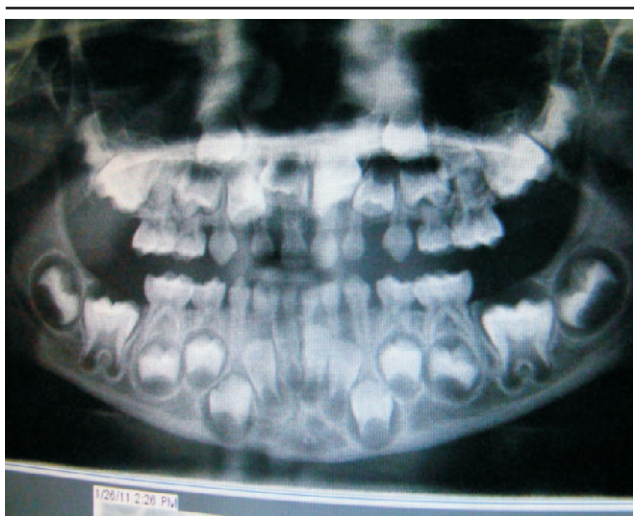

Figure 3. Case 1: Panoramic radiograph showing normal permanent dentition in both arches.

Case 3
This is a case of a healthy 6-year-old boy with a presenting complaint of pain from a slightly mobile tooth. On examination there was double tooth of the maxillary right primary central incisor (51) with grade I mobility **(Figure 6).**
Teeth present were
*16 55 54 53 52 51 61 62 63 64 65 26
46 85 84 83 42 41 31 32 73 74 75 36

*FDI World Dental Federation notation
Periapical radiograph revealed presence of two distinct roots and two root canals. There was delayed exfoliation of the double teeth resulting in delayed eruption of the permanent successor. The contralateral maxillary permanent incisor had erupted **(Figure 7).** A diagnosis of fusion of the maxillary right primary incisor with a supernumerary tooth was made and also delayed eruption of the maxillary right permanent central incisor. The double teeth were extracted to allow eruption of its permanent successor (11). Eruption of (11) was uneventful and the child was lost to follow up.

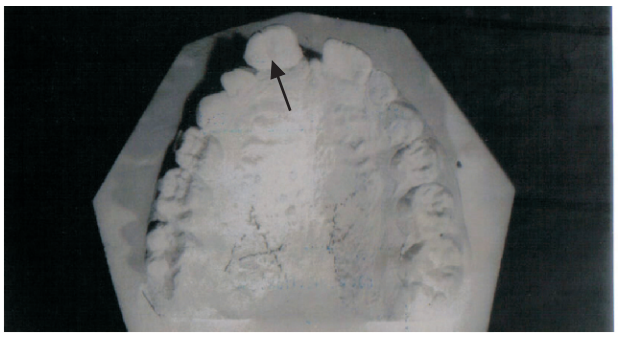

Figure 6. Case 3: Model showing the palatal view of fused maxillary right central incisor with a supernumerary tooth

Figure 7. Case 3: Periapical radiograph showing two crowns, two clearly distinct but joined roots with two separate root canals. Note the unerupted permanent right central incisor.

Figure 4. Case 2: Clinical pics showing bilateral double teeth. Fusion of the maxillary left central and lateral incisors and germination of the right central incisor.

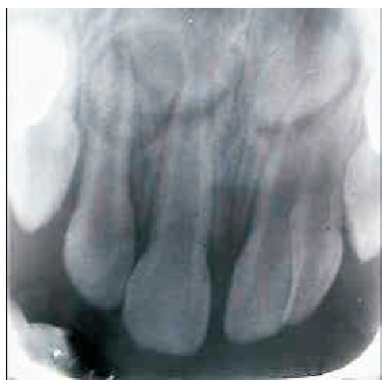

Figure 5. Case 2: Periapical radiograph showing two distinct but joined root canals in primary maxillary left central and lateral incisor and one root in the maxillary right central.

Discussion

The term double tooth is used to describe the morphological dental anomalies called fusion and gemination[7,13]. Three morphologic types of primary double teeth were presented in this paper. Case 1 is Aguillo's type III involving the mandibular lateral incisor and a supernumerary tooth. The child also had a history of natal tooth, now part of the normal primary dentition. Case 2 is type I involving the maxillary right central incisor and type IV involving the maxillary left central and lateral incisors. This child also had aplasia of the permanent lateral incisor. Case 3 is also a type IV involving the maxillary right incisor and a supernumerary tooth.
The clinical interest in double teeth is in relation to the associated problems. Double teeth may be asymptomatic but they can result in a number of dental difficulties. Double teeth have irregular morphology. They are prone to caries and periodontal disease, and are associated with spacing problems. The caries and periodontal complications occour particularly in fusion due to the presence of vertical grooves between the union of the teeth involved. The defects can be pronounced and extend subgingivally thereby enhancing bacterial plaque accumulation. Early pulpal involvement and sometimes apical periodontitis may result and lead to early tooth loss[1, 2, 4, 7, 10.12, 14]. The vertical grooves in Cases 1 and 2 (maxillary left) were minimal but they were still sealed to prevent caries. Other caries preventive measures were also instituted in the children.
The presence of primary double teeth can also cause delayed exfoliation of the affected teeth due to greater root mass and increased root surface area[7, 13]. The Type IV double teeth is reputed to be associated with this clinical problem. Delayed

exfoliation may lead to ectopic or delayed eruption of the permanent successor as in Case 3. In this instance, extraction of the double teeth would allow eruption of the permanent successor.

One of the most common problems related to double teeth is aplasia of the permanent successors[2, 7, 15-16]. In the present study, hypodontia in the permanent dentition was observed in Case 2. The maxillary left permanent lateral incisor was confirmed missing radiographically. Brook and Winter (1970)[11] in their study, reported that half of the primary double teeth were followed by an anomaly in the permanent dentition and family histories of hypodontia or supernumerary teeth were found in some cases. However, the familial tendency of double teeth and the link with hypodontia was not ascertainable in the in this report cases[11].

The management of primary double teeth and the associated clinical problems will depend on early diagnosis. Prevention of the associated problems should be the main aim[1, 6, 12-14]. Prevention of caries entails reducing tooth surface susceptibility by fissure sealant or composite restoration as carried out in Cases 1 and 2. Other appropriate caries preventive methods should also be applied and this includes dietary counseling, oral hygiene instructions and the appropriate use of fluoride. Where there is apical pathology the primary double teeth are better extracted than subjecting them to endodontic treatment. Where crowding is evident, orthodontic assessment would be required for effective treatment plan. The primary double teeth would eventually be extracted to allow orthodontic alignment of the permanent dentition. Separation of crowns to enhance aesthetics is not recommended for primary double teeth because aesthetics is usually not a major concern at this stage in the child's life. A gentle accentuation of the grooves to stimulate two separate teeth can be done where possible to satisfy a strong request.

The cases of primary double teeth presented in this report exhibited some of the clinical problems which have been enumerated and they were effectively managed. The occurrence of double teeth (a morphological anomaly) in association with natal tooth (an eruption anomaly) in Case 1 may not be easily explained. It may well be a chance occurrence. However, the polygenic control of odontogenesis and tooth eruption and the many mutations that can occur may be partly responsible[1]. Heredity as an aetiological factor was exhibited in Case 1. However the aetiology could not be ascertained in the other two cases. Due to the non attendance of the sibling in Case 1, who is now in the permanent dentition, none of the clinical problems could be confirmed in him. The bilateral presentation of double teeth as seen in Case 2 is uncommon. With the occurrence of gemination on the maxillary right and fusion on the maxillary left in the same child, it can be suggested that the pathophysiology of the two anomalies are closely related. The Type IV double teeth (fused) in Case 2 has the tendency to experience delayed exfoliation and consequently delayed eruption of the permanent central incisors. The missing maxillary left permanent lateral incisor in the child is also of concern. This observation underscores the need for close monitoring to prevent and manage these clinical problems.

Conclusion

Although primary double teeth are asymptomatic and in some cases may not interfere with function, they do have associated clinical problems. Early diagnosis and regular clinical and radiographic observations are necessary for effective management and appropriate treatment of the anomaly.

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