

Fusion of teeth: A presentation of four cases.

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ABSTRACT

Objective: To describe four cases of fusion and the individualized treatment methods based on patient needs in low resource economy.

Methods: Patients that were seen with cases of fused teeth in the dental clinic were assessed. Clinical photographs were taken for all patients. Investigations carried out included periapical radiographs when available. Treatment was tailored to fit the needs of the patients seen.

Results: A total number of four (4) patients were seen. There were 2 adults and 2 children both males and females in equal proportion. The children were aged 4 and 5 years old while the adults were 28 and 32 years old. One case was found in the left maxilla between the primary central and lateral incisors; the other three were in the mandible out of which one was a fusion between 2 supernumerary teeth. All the cases were unilateral. Treatment was extraction in two cases, restoration in one and oral prophylaxis in another.

Conclusion: Fusion of teeth is an uncommon presentation; early detection and management can prevent an apical lesion. Treatment can be tailored to individual presentation and need.

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INTRODUCTION

Fusion or germination, both of which are primary developmental abnormalities of teeth, is caused by the persistence of the dental lamina between two or more tooth germs, or by the attempt of a supernumerary tooth to develop from the remnants of the dental lamina after it has divided from a neighbouring tooth germ (Hitchin & Morris, 1996). This union of two normally separated tooth buds results in formation of a

joined tooth with confluence of dentine (Garvey et al., 1999).

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Gemination is an attempt by a single tooth germ to divide resulting in a large single tooth with a bifid crown and usually a common root and root canal (Duncan & Helpin, 1987). The aetiology of dental fusion remains unknown but it has been postulated that it may originate from either

genetic or environmental factors. Some authors suggest that it may occur due to pressure of germs of adjacent teeth during their development which produces a tissue necrosis resulting in the enamel organ and the dental papillae of two teeth to produce a single tooth (Tasa& Lukacs, 2001; Wu & Lin, 2010). This confluence often results in the formation of a deep groove on the labial and lingual/palatal surfaces with incisal notching (Bharghav et al., 2012). Plaque accumulation takes place in the deep groove which often leads to dental caries and periodontal disease (Bharghav et al., 2012). Other clinical problems relating to fusion may be unacceptable appearance or alignment of teeth. Fusion may occur unilaterally or bilaterally in any quadrant of the jaws in both primary and permanent dentitions (Garvey et al., 1999; Tewari et al., 2011). When fusion occurs in primary dentition, it may have adverse effect on the permanent dentition. Hagman (1988) in a study reported that when fusion involves central and lateral incisors, missing permanent successors may occur in 37.5% of the cases. Fusion may occur between two normal teeth or between a normal tooth and a supernumerary tooth which is an additional tooth to the normal series of teeth Fused teeth are more common in the mandible than in the maxilla (Saxena et al., 2008) and most often involves the mandibular lateral incisor and

canines; occurrence in the posterior region is rare (Tsujino et al., 2013; Zengin et al., 2014). The objective of present study was to describe four cases of fusion and the individualized treatment methods based on patient needs in low resource economy.

CASE PRESENTATION

Case 1

A 4-year-old boy in the company of his aunt visited the dental clinic with a complaint of pain and swelling of the gum on the left maxilla. The pain disturbed the patient's sleep the night before presenting to the clinic. This was his first visit to the dentist. No significant family and medical histories were elicited. Extraoral examination did not show any facial swelling. On intraoral examination, (Figure 1a) an alveolar abscess was observed labial and apical to the maxillary primary central and lateral incisors which appeared to be conjoined. The groove between these teeth was dark and appeared carious. There was hypoplasia of the labial surfaces of these teeth. A periapical radiograph (Figure 1b) revealed fusion of crowns and roots of these teeth with apical radiolucency and fusion of succedaneous permanent central and lateral incisors. Exodontia of the two teeth showed apical granuloma of fused roots (Figure 1c).

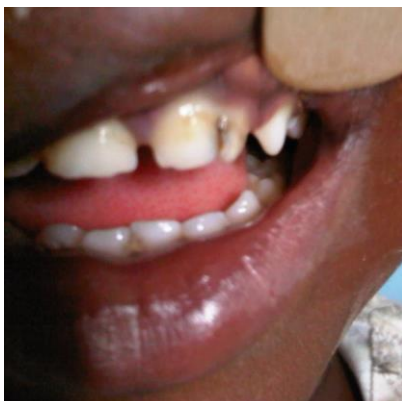


Figure 1a

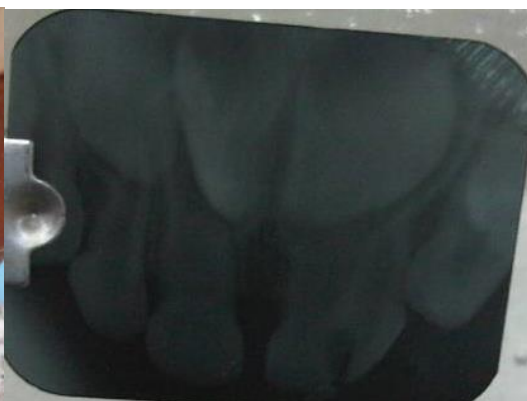


Figure 1b



Figure 1c

Case 2

A 5-year-old girl was brought to the clinic by her mother with the complaint that there was something dark between her daughter's lower teeth. No associated pain was reported. This was her first dental visit. There was nothing to note in

her family history. On examination, fusion was observed between her left mandibular primary lateral incisor and canine teeth. On slight probing, a carious lesion was noticed between the fused teeth (Figure 2a). No imaging facility was available during their visit but clinical

photographs were taken. The patient's mother was informed of the delicate nature of the case and the importance of conservative management of the teeth involved. The cavity was carefully excavated and filled with Glass Ionomer Cement

(GIC) after copious irrigation (Figure 2b). Patient was followed up after one week; then four weeks; then three monthly for one year till the patient was lost to follow-up.



Figure 2a



Figure 2b

Case 3

A 28-year-old female corps member visited the clinic for check-up because she was told by her dentist to visit any dental clinic wherever she finds herself six-monthly. Further questioning revealed she underwent exodontia of her primary teeth which she said was double at that time and she wanted to prevent a similar episode. No other social or medical history was significant. On

examination, her oral hygiene was observed to be good but there was fusion of her mandibular right central and lateral incisors. There was no carious lesion in the groove and periapical radiographs did not reveal any apical lesion (Figures 3a & b). Scaling and polishing was done with oral hygiene instructions and patient was advised to visit a dentist anywhere she is regularly.



Figure 3a



Figure 3b

Case 4

This was an incidental finding. A 32-year-old male presented to the clinic with pain from the mandibular right premolar region. Pain has been persistent, there was food packing associated

with each meal and it increased after every meal. On extraoral examination, no facial swelling was detected. On intraoral examination, two supernumerary teeth were observed standing

lingual to the mandibular right first and second premolars. There was gingival inflammation with food packing between the supernumerary teeth and the premolars. Extraction of the supernumerary teeth was decided and was

carried out to eliminate the crowding and the food packing. On extraction, the two supernumeraries came out together and they were discovered to be fused (Figure 4).



Figure 4 (arrow showing the groove between teeth)

DISCUSSION

The prevalence of fusion is estimated as 0.5-2.5% in the primary dentition with a lower prevalence in the permanent dentition (Umweni&Ojo, 1998; Mohapatra, 2010; Olatosi&Sote, 2011). In the four cases described above, which is not a large sample, fusion was found to be in equal proportion in primary and secondary dentitions. Fused teeth have been found to have a predilection for the mandible over the maxilla (Saxena et al., 2008). This is in tandem with this report as 3 out of 4 reported cases occurred in the mandible. Case 1 presents a peculiarity because the patient presented with fusion of the maxillary primary central and lateral incisors.

The early presentation of case 2 led to the avoidance of an apical lesion and possible extraction of the fused teeth as occurred in case 1. The choice of GIC as a restorative material of choice in this peculiar case is that it is aesthetically attractive (Nicholson,1998), in addition, by incorporating fluoride, it exhibits anticariogenic properties (Anusavice, 1996).

The effects of primary double teeth on their permanent successors were observed in cases 1 and 3. It was observed in case 1 that the permanent successors of the primary central incisors and lateral incisors were already fused (Figure 1b) while case 3 was a presentation of a fused permanent central and lateral incisors whose predecessors were also fused according to the patient. Hagman (1988) in a study reported that when fusion involves central and lateral incisors, missing permanent successors may occur in 37.5% of the cases.

Fusion can occur between normal teeth or between normal and supernumerary teeth (Pereira et al., 2000).The occurrence of fusion between two supernumerary teeth is rare. The incidental finding of fusion between two supernumerary teeth in case 4 makes this occurrence worth reporting in the literature. In addition to this uncommon finding in two supernumeraries, it occurred in the premolar region.

Fusion of teeth usually results in hypodontia – the absence of a tooth or teeth, exclusive of the third molars (Gupta et al., 2011). This differential diagnosis of fusion based on the number of teeth present is not always precise (O’Reilly, 1995). as hypodontia was observed in three out of the four cases reported except the fused supernumerary teeth in which hypodontia was not expected.

A supernumerary tooth can either be supplemental or rudimentary depending on their form. Supplemental refers to supernumerary of normal shape and size, whereas rudimentary refers to teeth of abnormal shape and smaller

size, including conical, tuberculate, and molariform types (Rajab & Hamdan, 2002).

The supernumerary in this case presentation can be described as rudimentary from their shape and size (Figure 4).

In many cases, supernumerary teeth are not associated with any problem. They may be accidentally detected during dental examination or may be found during routine radiographic evaluation (Ghaderi & Rafiee, 2016).

An attempt was made to classify the fused teeth in these case studies according to Aguillo et al. (1999) Based on the criteria employed by him (Table 1).

Table 1: Classification of fused teeth according to their morphology

Type	Criteria
Type I	A single bifid larger than normal crown with a notch on the incisal edge. A bifid pulp chamber. Normal sized root and a radicular canal with widening in the cervical portion.
Type II	Large crown and large root: A larger than normal crown usually with a groove or notch, a single large pulp chamber. A root that is larger than normal along its length and one shared root canal.
Type III	Two fused crowns with a double conical root.
Type IV	Fused crowns, double roots, two (or more) clearly distinct but joined roots with two separate canals.

Case 1 on examination falls into type IV, which agrees with his study that type IV is mostly found in the maxilla.

Case 2 falls into type III or type IV. Due to the absence of radiological examination, it could not be confirmed.

Case 3 falls into type II.

Case 4 can be said to be of type III.

Types II and III were only found in the mandible by Aguillo et al. (1999) as can be observed in the cases presented above.

In the cases described above, treatment which included extraction of teeth, restoration and dental prophylaxis were tailored to the peculiar needs of the patients. However, in some situations, endodontic therapy or separation with restoration, can be considered if needed.

CONCLUSION

Fusion of teeth is a rare occurrence. Early presentation or detection on examination can prevent loss of teeth by exodontia or/and huge financial implication due to advanced restorative treatment. Treatment in these presentations,

were targeted towards individual needs of the patients.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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