CASE REPORT

Synodontism involving both primary and permanent teeth in a mixed dentition case
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Abstract
Fusion is a sort of developmental alteration due to the union of 2 adjacent tooth buds. It can be either partial or complete fusion, depending on the stage of tooth development. It can occur in either deciduous or permanent dentition. Here, we report a rare case of fusion in both deciduous and permanent teeth that are in between deciduous maxillary central and lateral incisors and in between permanent mandibular central and lateral incisors in a 10-year-old boy.

Keywords: Bifid teeth, connated teeth, developmental disturbance, double teeth, fusion, synodontism

Introduction
Odontogenesis is a complex process of initiation, proliferation, histodifferentiation, and morphodifferentiation. Any disturbance in any of these stages leads to developmental anomalies of tooth and can be understood in terms of alteration in shape, number, size, and structure.

Fusion is one of the many developmental disturbances, wherein there is union of 2 separate tooth buds, either in the earlier or later stages of tooth development. The stage of development during union dictates the confluence of pulp canals and mineralized tissues of the adjacent tooth buds.

Fusion is said to be complete if it occurs in the early stages of development and partial if occurs during later stages. A groove separating 2 crowns can be noted in partial fusion. Few synonyms of fused teeth are double teeth, conjoined teeth, bifid teeth, and connated teeth.

Etiology: The etiology can be congenital or inherited or acquired or idiopathic. Commonly accepted theory is that, when tooth buds are subjected to undue physical force or pressure, it leads to their fusion. Other etiological factors suggested are thalidomide embryopathy, hypervitaminosis, fetal alcohol exposure, and syndromes such as trisomy 21, orodigitofacial syndrome, and Pierre–Robin syndrome.[1–3]

Canines and lateral incisors are the most frequently involved teeth in cases of fusion and are more common in deciduous than in the permanent dentition.[2,4] Fusion has a prevalence of 0.1–2.5% in primary dentition and 0.1–0.2% in permanent dentition and has an equal predilection for males and females and favors Japanese population compared to the Caucasian population.[1]

Fused teeth affect esthetics, may cause spacing, caries due to the presence of indentations or deep grooves, and are of orthodontic concern and hence should be followed up and treated accordingly.

Case Report
A 10-year-old boy presented to our clinic, with a chief complaint of delay in eruption of permanent tooth in his lower left front tooth region. On examination, there was retained deciduous lower left lateral incisor, the patient had mixed dentition, and spacing was present in the upper and lower anterior region. There was lag in eruption for the actual age of boy. There were fused teeth
with increased mesiodistal dimension with respect to maxillary right deciduous central and lateral incisors and mandibular right permanent central and lateral incisors. The fused maxillary primary teeth resembled a decayed, erupting permanent central incisor due to wide dimension and an indentation/groove which was decayed at the midline of tooth. The mandibular teeth were better fused and showed no significant groove along the line of fusion. When the number of teeth was counted in each arch by considering 2 fused teeth as 1, count was found to be one less than the normal, indicating it to be fusion and not gemination.

Catering to the chief complaint, extraction of retained, mobile mandibular deciduous left lateral incisor was made to facilitate the eruption of corresponding permanent tooth [Figures 1 and 2].

The findings were confirmed with intraoral periapical radiographs. Caries in maxillary fused incisors involved enamel and dentine only and showed 2 pulp chambers and canals. Developing permanent upper right central and lateral incisors were present in the maxillary bone. Mandibular fused permanent incisors too showed 2 separate pulp chambers and canals [Figures 3 and 4].

History revealed generalized delay in eruption of deciduous and permanent teeth. Reason for delayed exfoliation of deciduous fused teeth can be attributed to thick roots of fused teeth with wider surface that is tough to be resorbed. Family history revealed that he has a twin brother and that there are twins in every generation from the past 3 generations. On examination of oral cavity of the identical twin, there were no developmental anomalies found in him, but he too had delayed eruption of primary and permanent teeth. The delay was more in our patient compared to his twin brother. No consanguinity reported in parents, and no other abnormalities were found.

Figure 1: Fused maxillary right deciduous central and lateral incisors and mandibular right permanent central and lateral incisors with increased mesiodistal dimension

Figure 2: Maxillary and mandibular casts showing fused maxillary right deciduous central and lateral incisors and mandibular right permanent central and lateral incisors

Figure 3: Radiographic image of fused maxillary right deciduous central and lateral incisors with separate pulp chambers and canals

Figure 4: Radiographic image of fused mandibular right permanent central and lateral incisors with separate roots, pulp chambers, and canals
Discussion

Our case report presents a rare case of fusion in both primary and permanent teeth in a mixed dentition patient, who also showed delayed eruption of primary and permanent teeth.

Typically, there is one tooth less than the normal count in both maxillary and mandibular arches. We can consider this to be a case of partial fusion, as in the radiographs, we can appreciate 2 separate pulp chambers and canals with respect to both maxillary right primary central and lateral incisors and mandibular permanent central and lateral incisors. This indicates that fusion of these teeth has occurred in later stages of tooth development. There is no dental agenesis, and all permanent teeth are present.\(^1\)

Clinical consideration

The management of a case of fusion depends on the factors of affected teeth, if they are primary/permanent, decayed/healthy, age of the patient, spacing, the level of fusion, periodontal, and esthetic concern.

When the pulp chamber and canals are distinct as in our case, the following treatment modalities can be followed: Firstly, separating the fused teeth and extracting one of the anomalous tooth followed by orthodontic closing of space; secondly, surgically separating the fused teeth and restoring the teeth aesthetically; thirdly, safe and selective grinding of the fused teeth to reduce the mesiodistal dimension for esthetic concerns. Ankylosis may be expected when the fused tooth is endodontically treated, extracted, and again reimplemented, as it would then lack periodontal membrane. If grooves demarcating the fused teeth are very deep and extend subgingivally, plaque accumulation in this area is high, and strict oral hygiene is required to maintain good periodontal health. One such challenging case has been reported by Filho et al. where fusion between normal and supernumerary tooth was treated with root canal treatment, apical endodontic surgery, extraction of supernumerary tooth, and bone graft.\(^2\,9\)

Fusion is often confused with a similar developmental anomaly; gemination. Gemination is a result of an incomplete division of a single tooth bud. Hence, there is normal number of teeth when the defective tooth is counted as one. Whereas in fusion, there is one tooth less in number than the normal tooth count. This difference is not true when fusion occurs in between one normal and another supernumerary tooth. A clue in such cases would be the morphology of teeth; the supernumerary tooth crown is usually conical in shape. Due to this difficulty in differentiating them clinically, the term “double teeth” is applied to both gemination and fusion.\(^4\)

Neena et al. quoted a classification of double teeth by Aguiló et al., wherein anomaly teeth are divided into 4 morphological types using clinical and radiographic appearance.\(^3\)
- Type I single bifid larger than normal crown with a notch on the incisal edge, bifid pulp chamber, and normal sized root and pulp canal with widening in the cervical portion.
- Type II large crown and a 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 large 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.\(^3,10\)

Conclusion

This was about our rare case of fusion in both primary and permanent teeth in a mixed dentition patient. Successful management of fused teeth depends firstly on their identification, morphology, knowledge, and skills of the practitioner. Long-term observation of the condition is mandatory as it may cause issues with occlusion, and patients should be advocated with good oral hygiene techniques to prevent decay along the most susceptible line of fusion. A comprehensive approach toward treating dental anomalies can provide patients with functional and esthetic satisfaction.

In our case, patient and guardian were keen on a minimally invasive approach of treatment, they were explained about the consequences of decay in the maxillary fused teeth and advised filling before pulpal involvement occurs, advised good oral hygiene practice, and recalled for regular follow-up checkups in the future as orthodontic intervention is required.

References


How to cite this article: Kavya BM, Revanna GM, Girish HC, Murgod S. Syndontism involving both primary and permanent teeth in a mixed dentition case. J Med Radiol Pathol Surg 2019;6:12-14.