CASE REPORT

'Triplication' defect in deciduous teeth: an unusual odontogenic anomaly

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SUMMARY

Developmental odontogenic anomalies can occur in primary as well as in permanent dentition leading to morphological variations in shape, size and structure and numerical variations such as hypodontia. The most commonly reported odontogenic anomaly in primary dentition is conjoined teeth. Conjoined teeth can be due to fusion or gemination. Relevant clinical and radiographic evaluation is a must to differentiate between the two. Occurrence of double fusion as an anomaly may not be infrequent, but triple fusion is a rare odontogenic anomaly. We report a case of a 7.5-year-old girl who clinically had a large crown due to triple fusion in her dentition, between two normal primary teeth and a supernumerary tooth. This paper gives a brief insight into the incidence, associated quandaries and diagnosis and treatment modalities of a triple fusion.

BACKGROUND

Developmental odontogenic anomalies can occur in primary as well as permanent dentition¹ leading to morphological variations in shape, size and structure and numerical variations such as hypodontia. Fusion and germination can lead to both morphonumerical variations. The prevalence of triple fusion in primary teeth is a rare anomaly.^{2–7} A lower prevalence tends to trivialise the importance of these anomalies. Fused teeth can result in various clinical reverberations on permanent dentition as well on the existing dentition and on the involved teeth themselves. Hence, meticulous clinical and radiographic evaluation and perpetual monitoring are indispensable.

CASE PRESENTATION

A 7.5-year-old girl accompanied by her mother reported to the Department of Pedodontics and Preventive Dentistry with large lower left front teeth and delay in the eruption of the permanent tooth in the same region where the large tooth was present. They also gave a brief history that the lower right primary incisor had shed 9 months earlier; but the left incisor had remained intact without showing any signs of shedding (mobility). Clinical intraoral examination revealed two-third of the right permanent central incisor had erupted, and also the presence of unusually large fused triple teeth with deep vertical groove on labial and lingual surface, at the union, without any caries. Other findings such as exfoliated maxillary primary teeth and deep caries in all the posterior teeth were recorded. Clinically, it looked like a combination of

Figure 1 Clinical photograph depicting fusion between 71, S and 72.

gemination and fusion (figures 1–3). A radiograph was advised to differentiate between gemination and fusion.

INVESTIGATIONS

An intraoral periapical radiograph (IOPA) was advised in order to evaluate the status and root of the tooth, as well as to differentiate whether it was a case of fusion or gemination. The radiograph confirmed the fusion of the three teeth all along the crown and the root. But all the three teeth had distinct pulp chambers and root canals. The roots of the left primary central incisor and the supernumerary tooth had undergone more than one-third root resorption, whereas the root of the lateral primary incisor was intact. The primary, central and lateral incisors had their corresponding succedaneous teeth (figure 4).

TREATMENT

No treatment was initiated pertaining to the triple fusion, since the tooth was asymptomatic and the

Figure 2 Occlusal aspect of the fusion between 71, S and 72.

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Figure 3 Lingual aspect of the fusion between 71, S, and 72.

root was undergoing natural resorption. The patient was under observation and reviewed at periodic recall to assess the eruption of the succedaneous tooth. The patient was made aware of the other dental problems that needed treatment and was initiated. A radiograph was taken after 3 months and the fused roots had undergone a substantial amount of resorption, which confirmed that no further intervention was needed.

Figure 4 Intraoral periapical radiograph revealing fusion between 71, S and 72.

Figure 5 Intraoral periapical radiograph after 3 months, revealing the root resorption.

OUTCOME AND FOLLOW-UP

A 3-month follow-up showed a substantial amount of root resorption with mobility, which necessitated no further intervention (figure 5).

DISCUSSION

Developmental odontogenic anomalies can occur in primary as well as permanent dentition leading to morphological variations in shape, size and structure and numerical variations such as hypodontia. According to Kramer *et al*⁸ the most commonly reported odontogenic anomaly in primary dentition is conjoined teeth. The anomaly of conjoined teeth can lead to morpho-numerical variation in primary as well as permanent dentition.

Conjoined teeth are known by several terms such as double teeth,^{2 9–11} joined teeth,² fused teeth,^{2 12} gemination, dental twinning, concrescence, conjoined teeth, twinned teeth, double formations, gemini-fusion, vicini-fusion,¹³ synodontia¹⁴ and connoted teeth.^{15 16} A conjoined tooth can be in the form of double teeth or triple teeth, the cause of either can be fusion, gemination or concrescence.³ The term 'double tooth' was first suggested by Miles in 1954,¹⁷ and the term 'triple tooth' was first used by Knapp and McMahon in 1984.³ Pindborg¹⁸ defined the two or more separate developing teeth between dentin and enamel thereby occasioning a bifid crown and single root as fusion.

The prevalence of double teeth has been reported to vary from one population to another, depending on geographic, racial or genetic factors. Double teeth are more common in primary dentition.^{19 20} The literature around the world has reported the prevalence of unilateral double teeth in primary dentition varying from 0.1%²¹ to 5%,²² whereas bilaterally from 0.01%²³ to 0.12%.²¹ However, the occurrence of triple teeth is rare^{2–7} and there is a dearth of literature pertaining to the prevalence of

triple fusion; only one study by Ravn⁷ reported a prevalence of 0.02% of triple tooth in primary dentition.

Triple tooth is more prevalent among boys,²⁴ but in the present case it was seen in a girl. Triple tooth is more common in the maxillary arch than mandibular by site,²⁵ but in the present case it was in the mandibular arch. Preponderance for occurrence is more towards the left side, as seen in the present case.²⁴ The three teeth had separate roots and pulp canals, which is the case in the most common reported type of triple tooth.²⁵ There are cases that have reported the absence of succedaneous teeth^{2 7 21 26} or agenesis,²⁴ which was not seen in the present case.

Usually, fusion occurs between teeth of mixed dentition, same dentition or between supernumerary teeth and normal.^{7 27} The fusion in the present case was between normal and supernumerary teeth, that is, the mandibular primary, central and lateral incisor and a supernumerary tooth, which was similar to cases reported elsewhere.²⁴ Cases of fusion between normal teeth have also been reported.^{20 25} Higher prevalence has been reported in Asian and Asian-derived populations.²⁸

Various authors have proposed different theories behind the aetiopathogenesis for fusion, but none are completely acceptable. Some of the aetiopathological factors causing fusion are close approximation of developing tooth buds, which fuse before calcification,⁷ physical pressure or force generated during growth causing contact between adjacent tooth germs,²⁹ viral infection during pregnancy, use of thalidomide,³⁰ genetic control,¹⁰ evolution, trauma, environmental factors,³¹ embryological persistence of the interdental lamina between two germs,³² systemic disease, lip and palate disease, X linked congenital conditions, lack of space in the dental arch and cleft, and lack of vitamins.^{26 33} L Aguilo⁹ has suggested hyperactive dental lamina in cases where the succedaneous tooth is present and where there is disproportionate activity of dental lamina in the absence of a succedaneous tooth.

Some common problems associated with fusion are, aesthetics because of an abnormally larger crown, susceptibility to dental caries due to deep grooves at the site of fusion, periodontal disease due to subgingival bacterial plaque, ectopic eruption and delayed eruption of succedaneous teeth, arch asymmetry, occlusal disturbance, anomalies in the permanent dentition such as impaction of successors, supernumerary teeth and aplasia of teeth.^{13 24 27 28 34-39} In the present case, aesthetics had been hampered due to a clinically large crown and delay in exfoliation of the primary teeth, in turn leading to delay in the eruption of a succedaneous tooth. The radiograph revealed presence of succedaneous teeth, which appeared normal.

Diagnosis is made based on intraoral clinical examination and radiographs. Clinical examination can often mislead, particularly in cases of gemination. Levita's classification¹⁵ may be useful in such situations, where diagnosis can be established based on the number of teeth present in the arch. In the present case, Levita's criterion of counting the teeth in the arch may not apply, as there was the dilemma of whether to consider the teeth under question as one, two or three, and also confusion as to whether the case was of fusion or germination. Hence an IOPA radiograph was advised. Radiographs are often helpful in diagnosing and differentiating fused teeth from gemination. Based on the classification of triple tooth proposed by Shilpa and Nuvvula²⁴ the present case is classified as type 1a, that is, three pulp chambers and three root canals and fusion of two normal teeth with a supernumerary tooth.

Treatment of triple teeth varies according to the clinical need, from simple periodic observation, to preventive measures, to

extraction. Most fusion cases are asymptomatic and may need regular monitoring. Cases where deep grooves are present along the fusion and prone to caries, preventive measures such as fluoride application and sealant therapy can be instituted, and the carious tooth can be restored.²⁷ In cases of delayed exfoliation, extraction^{3 5 6} may be more prudent to avert malocclusion. In the present case, periodic follow-up was performed.

Learning points

- ▶ Fused teeth may be asymptomatic but do need periodic monitoring to rule out their untoward effect on succedaneous teeth.
- ▶ Fused teeth are susceptible to caries because of deep grooves for which preventive measures are needed.
- ▶ Delay in the eruption of succedaneous teeth can be attributed to the fact that larger root surface resorption has to occur before the succedaneous tooth can erupt.
- ▶ A larger clinical crown can lead to poor aesthetics, spacing or crowding, predisposing to further malocclusion.
- ▶ The diagnosis has to be made based on the clinical picture and radiographs, and presence of supernumerary may make the diagnosis tricky.

Competing interests None.

Patient consent Obtained.

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