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Incidental Finding of a Supernumerary Tooth Fused to a Mandibular Second Molar Using Cone Beam Computed Tomography (CBCT): A Case Report

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ABSTRACT

The twinned tooth is a rare phenomenon among dental anomalies, which may develop during the bud stage tooth morph differentiation. Twinned tooth refers to the fusion of two adjacent tooth buds or gemination of the single bud. Clinically it is difficult to differentiate between fusion and gemination. During this anomaly, primary dentition is mostly affected rather than permanent dentition, and predominantly, it is observed unilaterally. Gemination is more common in the anterior region of maxilla, while fusion mainly occurs in the anterior mandibular region. There is no definite etiology for these anomalies reported, but genetic and environmental factors are mostly mentioned as potential risk factors. This paper describes a case of fusion of the second mandibular molar with a supernumerary tooth. Twinned teeth can cause clinical problems such as dental caries, periodontal, and aesthetic problems. Early diagnosis can be achieved through careful clinical and radiographic examinations; however, in most cases of twinned teeth, no significant clinical problem is reported.

1. Introduction

Gemination and fusion are both classified as developmental anomalies of dental hard tissues.[1] Differentiation of these two abnormalities through clinical examination and conventional radiographs is hard. This Cone Beam Computed Tomography (CBCT) is used for an exact diagnosis.[2, 3] The term "twinned tooth" is preferred to be used by some researchers. "Double tooth," "double formation," "joined teeth," "fused teeth," "synodontia," "schizodontia," and "concrescence" also used instead, to describe this anomaly.[4] Distinguishing between fusion, gemination, and concrescence is confusing. Thus some researchers have suggested using the word "twinning" instead. However, some others believe that it can also be perplexing because these words have specified definitions. Hence there is still controversy among researchers about using these terms. In the case of gemination, two teeth develop from one tooth bud resulting in a single enlarged tooth containing a bifid crown and usually a single root canal. In this anomaly, the tooth count is normal, as the affected tooth counted as one. In contrast, if fusion occurs, there will be a missing tooth as the fused tooth counted as one unit. Fusion occurs when the two adjacent tooth buds form a single tooth but show separate pulp cavities.[2] A way of recognizing fused teeth is that when fusion happens, the tooth will present two separate pulp chambers and root canals in the radiographic images. In case the fusion occurs between a healthy tooth and an extra one, the diagnosis will be even more difficult.[3] Supernumerary teeth are also anomalous occurring with an incidence rate of 0.3% to 3.8% in the population. These new teeth are mainly seen in the maxilla but can be detected in any other region of the dental arch.[5] The etiology of this phenomenon is yet unclear, though hyperactivity of the dental lamina in the region and genetic are considered to be contributing.[6] This paper reports a case of fusion between a second mandibular molar with a supernumerary tooth, diagnosed through CBCT.

2. Case presentation

A 15-year-old girl was referred by her dentist because of the missing detected in the anterior region of the maxilla. The patient was in permanent dentition with spacing in the maxillary arch. The patient had no significant medical history with no revelatory past dental history and no history of trauma or tooth extraction. To investigate the existence of the permanent lateral incisors' buds, a panoramic radiograph performed. As observed in the panoramic view (Planmeca ProMax 2DS2, Finland), not only the lateral teeth of the maxilla (12 and 22 as named in FDI tooth numbering system) but also the third molar of the right side of the mandible (48) were absent. No tooth buds were observed in the region [Fig. 1].

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Fig. 1. Panoramic view showing missing of 22, 12 and 48 and an enlarged 47.

Based on the obtained conventional radiograph and patient's complaint of pressure feeling in the posterior left mandibular area and concern for 37's root resorption, a need for extraction of 38 diagnosed. For better determination of the left mandibular third molar, a CBCT was indicated. In the CBCT images (Planmeca ProMax 3D Max, Finland), a projection seen on the buccal side of 47 created an abnormal morphology. The 3D models provided with intervals of 1mm and slice thickness of 0,4mm. Panoramic view also showed an enlarged 47, which can be better distinguished in the multiplanar view. Taking the attained radiographs into consideration, a diagnosis of double teeth conducted. However, if not impossible, it is hard to distinguish between fusion and gemination in doubled teeth based on conventional images. Because they just produce a two-dimensional representation of a three-dimensional object.

The Cone Beam Computed Tomography revealed that the doubled tooth was a fusion between the second mandibular molar and a supernumerary tooth. The tooth had two separate pulp chambers, in contrast to gemination, in which the tooth shows only one root canal while presenting a bifid crown [Fig. 2]. The patient had no problem with the doubled tooth and was not bothered with the appearance; then, no urgent treatment achieved.

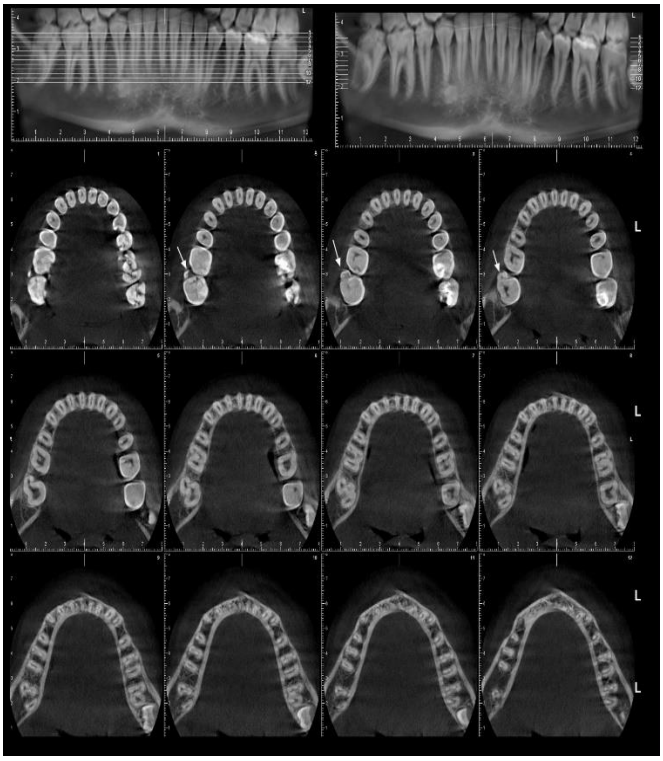

Fig. 3. Cone Beam Computed Tomography images showing complete separation of the pulp chambers of second mandibular molar and the supernumerary teeth.

3. Discussion

Unlike other dental anomalies, primary teeth are more entangled with twinning. The incidence rate is 0.6% among primary and 0.1% among the permanent dentition of Caucasians.[3] The prevalence is even higher in Asian and American populations, with prevalence figures of 5%.[7] To determine the prevalence of twinned teeth, Knezevic et al. examined over 3500 models and reached prevalence figures of about 0.5%, 57% showed fusion, and 43% showed gemination.[2] No difference between the genders detected.[3, 8] Generally, twinning occurs in the anterior region, and incisors and canines are the most involved teeth.[3, 5] Fusion commonly occurs in the anterior region of the mandible,[2] while gemination is predominantly seen in the anterior maxillary teeth.[7] Twinning rarely presented in the posterior region; however, a few previous case reports of fusion in the molar and premolar teeth are reported.[2, 5, 8, 9] The present case is a rare example of the fusion between a second mandibular molar and a supernumerary tooth.

The exact etiology of double teeth is unclear; however, some factors are supposed to be contributing to this abnormality. These factors include evolution, trauma, vitamin deficits, genetic predisposition, and other environmental factors.[4] It may also be associated with systemic disorders such as achondrodysplasia, chondroectodermaldysplasia,[4, 7] focal-dermal hypoplasia, otodental dysplasia, median cleft facial syndrome, oral-facial-digital syndrome, RusselSilver syndrome and KBG[4] (consist of the initials of the first three patients reported by Hermann). Axrup et al. and Bazan reported the rare occurrence of anomalous maxillary incisors in the company with various brain malformations.[10] Another study conducted by Knudsen revealed that dental anomalies like fusion, which most frequently observed in maxillary incisors, are associated with hypervitaminosis A.[11]

In cases of double teeth, it is difficult to distinguish whether it is a fusion or a gemination, especially when a normal tooth is fused to a supernumerary one. The crown and pulp chamber morphology, location, and several teeth can be useful indicators. Clinically, a bifid crown with two halves appearing as mirror images usually represent gemination. At the same time, fused teeth, especially when fusion occurs between normal teeth and supernumerary, commonly show two different halves.[3, 7] According to the radiographic images, fused teeth present two separate pulp chambers with two root canals, whereas geminated teeth usually have a single root.[3]

Radiographic imaging used as a diagnostic tool to distinguish the geminated teeth from fused teeth. Accuracy of conventional radiographs (periapical, occlusal, and panoramic images) in distinguishing the gemination from fusion is questioned as they provide only a two-dimensional image of a three-dimensional object.[2] Hence three-dimensional images are preferred as they present three-dimensional reconstructions on axial, sagittal, and coronal planes. Thus it can be concluded that Computed Tomography (CT) provides complete information compared with conventional images. Problems including high costs, the need for space, high radiation dose, and the longevity of the exposure time arose as the CT not designed for dental use.[5]

Nowadays, CBCT frequently used in dentistry to create a three-dimensional reconstruction of the patient's face and skull. CBCT is a volumetric 3D imaging modality. It presents better opportunities for improved anatomic diagnosis. This equipment enables us to measure maxillaries, location and extension of dental resorptions, radicular position, presence of radicular fractures, and diagnosis of bone lesions.[5] Lower radiation levels and lower costs compared with the CT have made the CBCT imaging a popular technique among dental radiographic images.[2] The distinction between fusion and gemination can be diagnosed using CBCT appliances, and then a proper treatment plan can be followed if necessary.

The most frequent problem caused by double teeth is the unaesthetic appearance of the involved tooth. Other dental problems such as increased carries susceptibility, interference with tongue and occlusion, and accidental cusp fracture can be seen in some cases.[12] Most of the cases do not present a major clinical problem. But as these teeth are more susceptible to caries in most cases, fissure sealant can be used as a preventive action.[12] Other surgical and endodontic treatments, if necessary, should be deferred until the maturation of the apex is complete.[7] In our case, no active treatment conducted because the tooth had no significant problem, and the patient was not willing for any preventive actions.

4. Conclusion

Fusion and gemination both can cause unpleasant appearance, space problems, increased caries susceptibility, and difficulty in normal tooth alignment. To improve the prognosis of the preventive, surgical, orthodontic, or endodontic treatments demanded, these anomalies should be detected earlier by the clinicians. Thus the dentists need to be familiar with these dental anomalies to inform the patient and the parents of the potential risks and choose the best treatment action. Also, the probability of fusion should be taken into consideration in the posterior region and among permanent teeth. However, these anomalies are more common in primary dentition and usually occur in the anterior region (incisors and canines). Thus every tooth should be inspected separately and carefully in the clinical and radiographic examination.

Conflict of Interest

The authors declared that there is no conflict of interest.

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References

1. Hattab FN. Double talon cusps on supernumerary tooth fused to maxillary central incisor: review of literature and report of case. Journal of clinical and experimental dentistry. 2014 Oct;6(4):e400.
2. Cho KM, Jang JH, Park SH. Clinical management of a fused upper premolar with supernumerary tooth: a case report. Restorative dentistry & endodontics. 2014 Nov 1;39(4):319-23.
3. Ekambaram M, Yiu CK, King NM. An unusual case of double teeth with facial and lingual talon cusps. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2008 Apr 1;105(4):e63-7.
4. Le Gall M, Philip C, Aboudharam G. Orthodontic treatment of bilateral geminated maxillary permanent incisors. American journal of orthodontics and dentofacial orthopedics. 2011 May 1;139(5):698-703.
5. Ferreira-Junior O, De Ávila LD, da Silva Sampieri MB, Dias-Ribeiro E, Chen WL, Fan S. Impacted Lower Third Molar Fused with a Supernumerary Tooth—Diagnosis and Treatment Planning Using Cone-Beam Computed Tomography. International journal of oral science. 2009 Dec;1(4):224-8.
6. Roslan AA, Ab Rahman N, Alam MK. Dental anomalies and their treatment modalities/planning in orthodontic patients. Journal of orthodontic science. 2018;7.
7. Nandini DB, Deepak BS, Selvamani M, Puneeth HK. Diagnostic dilemma of a double tooth: a rare case report and review. Journal of clinical and diagnostic research: JCDR. 2014 Jan;8(1):271.
8. Gunduz K, Sumer M, Sumer AP, Gunhan O. Concrescence of a mandibular third molar and a supernumerary fourth molar: report of a rare case. British dental journal. 2006 Feb;200(3):141-2.
9. Strecha J, Jurkovic R, Siebert T. Fusion of the 2nd maxillary molar with the impacted 3rd molar. Bratisl Lek Listy. 2012 Jan 1;113(9):569-71.
10. Bazan MT. Anomalous dental development with medical and genetic implications. Pediatric annals. 1985 Feb 1;14(2):108-16.
11. Knudsen PA. Dental anomalies in mouse embryos with hydrocephalus induced by hypervitaminosis A. Acta Odontologica Scandinavica. 1967 Jan 1;25(6):677-91.
12. Goswami M, Jangra B. A Rare Concomitant Occurrence of Talon Cusp in Fused Mandibular Permanent Teeth: Report of Two Cases. International journal of clinical pediatric dentistry. 2017 Apr;10(2):208.