

Case Report

Fusion between maxillary second molar and a supernumerary tooth: a case report

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Abstract: Fusion is a developmental anomaly, which is rarely observed in clinic. It can happen between normal and supernumerary teeth. Supernumerary teeth are those that exceed the normal dental formula. In this paper we report a rare case of fusion, involving permanent maxillary second molar and a supernumerary tooth, where endodontic treatment was provided and final restoration was accomplished.

Keywords: Endodontic treatment, fused teeth, supernumerary, talon cusp

Introduction

Occlusal surface of the maxillary permanent second molar is more frequent the rhomboidal. Its crown has 3 or 4 cusps, and the distolingual cusp is poorly developed. The mesiolingual cusp may have the cusp of Carabelli on its lingual side, which is about midway between its summit and the tooth's neck (the fifth cusp), and the rate is well below the permanent first molar [1].

Abnormal cusp rarely happens to the buccal cusps. Up to now, it is rarely reported that the maxillary second molar buccal cusps have abnormal cusp. Chinese researchers Wang Xuexia et al reported a case in 1999: Anatomical abnormality of the second maxillary molar, the right side tooth has two extra cusps that are fused to the surface of the buccal cusp, while the left side has one [2]. Zhang Liang et al reported one case in 2010: One abnormal cusp on the buccal cusp of the right maxillary second molar [3]. And Chen Xiaoxuan et al reported one case in 2011 that extra cusp is on the left maxillary second molar [4].

Those supernumerary cusps are termed as paramolar tubercle [5]. It is reported in previous studies that the incidence of paramolar tubercle in maxillary molars varies from 0% to 0.1%,

0.4% to 2.8%, and 0% to 4.7%, those figures are the rates of the first, second and third molar, respectively [6]. It is easy to surmise that teeth with abnormal morphology can cause improper occlusion predisposing or crowding, which can result in caries and periodontal diseases of the tooth. In such cases, the endodontic management is challenging because of the variation in the canal system. Conventional intraoral radiographs are widely used in the preoperative analysis. And CBCT (cone beam computed tomography) can reconstruct a three-dimensional image of the tooth, which helps to confirm the radiographic diagnosis and accuracy of endodontic treatment [7].

The purpose of this article is to present a case report on the endodontic management of a maxillary second molar fused to one paramolar tubercle with the help of the X-ray radiographs.

Case report and results

The following is the case report of the buccal abnormal cusp of the right maxillary second molar which was found in the Department of Conservative Dentistry and Endodontics in our hospital in the August of 2012.

A Nanjing native, 50-year-old female, presented to the Department of Conservative Dentistry

Fused tooth



Figure 1. A, B. Preoperative photograph: buccal view and occlusal view showing tooth 17 (right maxillary second molar) fused with its supernumerary counterpart with a buccal cusp. C. Preoperative radiograph revealing morphology of tooth 17.



Figure 2. Occlusal view of the tooth 27.

and Endodontics with chief complaint of pain in the right maxillary posterior region in the August 8, 2012. The patient gave a history of oral treatment in local hospital two days ago, and came to our hospital for the persistent pain. The patient's medical history was noncontributory.

On clinical intraoral examination (**Figures 1A, 1B, 2**): the right maxillary second molar exhibited abnormal crown morphology. The tooth revealed a paramolar tubercle fused to the buccal aspect development groove of the tooth 17, and the neck of the buccal aspect was filled by temporary, a wide range of damage can be seen. The tooth responded with obvious pain to cold temperature testing and was tender to percussion, mobility was absent, buccal gingival recession was obvious (**Figure 1A, 1B**), periodontal probing around the tooth was within physiological limits, and the occlusion between the upper and lower teeth was normal. Diagnostic preoperative radiographs revealed the tooth 17 had high-density images in its neck, the images of root canals were unclear, peri-

odontal ligament was widened slightly (**Figure 1C**). And the tooth 27 was well developed (**Figure 2**). A diagnosis of pulpitis was made, and root canal therapy and crown repair was suggested.

Treatment was initiated with the administration of local anaesthesia (articaine). Conventional endodontic access cavity was done on the occlusal surface and the pulp extirpation was performed, caries and temporary were removed from the buccal aspect of the tooth as well (**Figure 3A**). Then the tooth was isolated with rubber dam (**Figure 3B**). After the pulp tissue was excavated from the pulp chamber and the orifices identified were mesiobuccal (MB), distobuccal (DB) palatal canal (P) but the fused paramolar tubercle had no canal. The canals of the tooth were prepared using G bur to enlarge the upper part of the canal and #8 size "C" type pioneer file to dredge the canal. And the irrigation was done during and after the preparation. The canals were calcified in this case, MB and DB canals were moderate calcified and p canal was mildly calcified. Working length was confirmed with the help of X-ray radiographs (**Figure 3C**). And the lengths of MB, DB, P were 18.5 mm, 18.5 mm, 18 mm, respectively. The canals of the tooth were successfully prepared by Mtwo NiTi alloy file, enlarged to size #25 to their full working lengths. The canals were dried with paper points. Calcium hydroxide paste was used as the intracanal medicament, and the access was sealed with a temporary filling.

The patient returned to the dental clinic for her second visit one week later. The tooth was asymptomatic. Removed the temporary filling and calcium hydroxide was removed as well, and the canals were thorough irrigated. Dried the canals, filled the canals with "AH PLUS"

Fused tooth

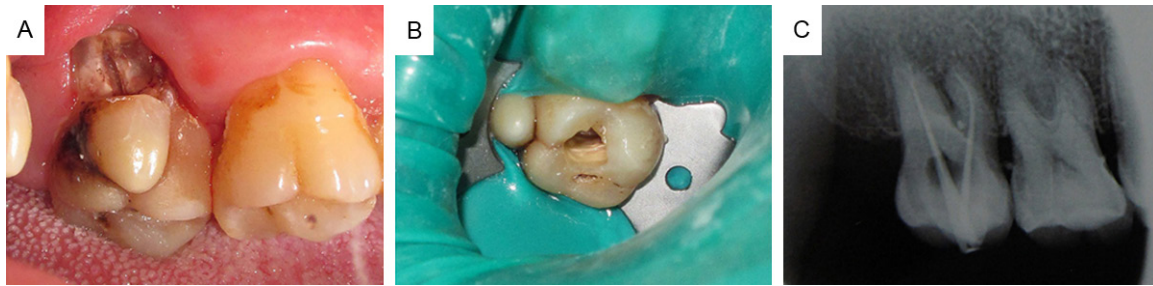


Figure 3. A. Operative photograph buccal view of the tooth 17. B. Access opening view. C. Working length determination.



Figure 4. A. Clinical image of restored 17. B, C. Postoperative final radiograph.

cataplasma and big taper of Gutta Percha Points. A postoperative final radiograph was taken, and it showed the canals were well filled (**Figure 4B, 4C**). The access was restored permanently with a universal composite resin restorative material (3 M nano resin), and selective grinding of the cusp was performed to rebuild a good occlusion (**Figure 4A**). And an advice was given to the patient that it was not allowed to bite hard objects. At 3-month follow-up, the patient was free of symptom.

And after a successful endodontic management for two weeks, we suggested her to acquire a coronal build-up to restore normal molar appearance.

Discussion

Variation in the anatomy of the maxillary second molar has been reported earlier, we found that only one case has abnormal cusps on both sides of the maxillary dental arch, and the others have one second molar with abnormal cusps, either on the left or on the right maxillary second molar's buccal aspect, bilateral abnormal cusps are rare to see. The case we report here has only one extra cusp on one side of the upper denture. The etiology of the super-

numerary cusp is still uncertain. The genetic factors are regarded as a possible etiology for this anatomic abnormality [8], but the mechanism has not been determined yet. According to a family history of the patient, her parents and siblings have no teeth deformities. And the patient is found just the right maxillary second molar's buccal aspect has abnormal cusp on the surface. Hyperactive dental lamina [9], combination of genetic and environmental factors are due to the fusion [10]. So in this case, it is more likely that the developmental and environmental factors caused the fusion.

Paramolar is one kind of supernumerary teeth in the molar region [11]. Fusion of the molar with the paramolar tubercle is particularly rare and there are only a few of case reports we can find in Pubmed. Similar reports on successful endodontic management of such cases have been reviewed, both in the mandibular and maxillary molars. Ramachandra et al reported a bilateral paramolar tubercles fused on the bistobuccal aspects of mandibular primary first molars [12], Ballal et al [13], Salem et al [14] and Ghogre et al [15] reported a fused mandibular second molar and a paramolar, Zhu Min et al presented a case of a mandibular second molar with three extra cusps [16] and Kato H et

al reported a similar case without finding any root canal treatments [11]. Preetham et al presented two cases of two maxillary second molars fused with paramolar tubercles on the in 2014, and endodontic treatment had been done successfully even there was a true pulpal communication between the paramolar tubercle and the molar [17]. Most of those case reports used CBCT or SCT to diagnose and finish the endodontic management. Jiang Keyu et al pointed out that CBCT can diagnose and anti-diastole supernumerary cusp for CBCT can reconstruct three-dimensional images, which can make it clear for the clinicians to know about the anatomy of the canal, and also to report a maxillary second molar fused with a paramolar tubercle [18]. We did the endodontic management successfully too, but the paramolar tubercle in our case did not have a separate canal, so there are no differences between the tooth 17 and normal maxillary molar in canal number.

Presence of a deep groove between the supernumerary and its permanent counterpart is highly susceptible to caries and periodontal diseases [19], as the dental hygiene is difficult to be maintained.

In conclusion, paramolar fused with maxillary molars is an unusual style of tooth abnormalities. It is important to figure out the canal system of those teeth, and CBCT is necessary if clinician is not sure about the number of canals. Every step of the endodontic treatment is crucial for the therapeutic outcome, and follow-up particular needed in complicated cases like our patient. A successful result of management of tooth with bizarre anatomy is presented.

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Disclosure of conflict of interest

None.

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