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Concrescence of maxillary second molar and impacted third molar: A case report

Su J *et al.* A case of concrescence

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Abstract

BACKGROUND

Morphological anomalies of teeth, including talon cusp, dens evaginatus, gemination, fusion, concrescence, root dilaceration, and taurodontism, always involve changes in the enamel, cementum and dentin. Diagnosing concrescent teeth through routine clinical examination alone is difficult, and most cases of concrescence are found accidentally during extraction. A definite preoperative diagnosis of concrescence would contribute to a better treatment plan and fewer undesirable complications

CASE SUMMARY

A 47-year-old woman who complained of left maxillary first molar loss for half a year presented to our department seeking treatment by dental implant restoration. Panoramic radiography and cone-beam computed tomography (CBCT) showed an unclear boundary between the distal root of the second molar and the mesial root of the third molar. The teeth were extracted under local anesthesia, and a definite diagnosis of concrescence was made by histopathological examination.

CONCLUSION

CBCT is a useful tool for diagnosing and planning the management of tooth concrescence and may be beneficial for reducing unnecessary complications.

Key Words: Concrecence; Impacted tooth; Concentrate growth factor; Maxillary third molar; Tooth anomalies; Cone-beam computed tomography; Case report

Su J, Shao LM, Wang LC, He LJ, Pu YL, Li YB, Zhang WY. ¹Concrecence of maxillary second molar and impacted third molar: A case report. *World J Clin Cases* 2022; In press

Core Tip: Diagnosing concrecent teeth through routine clinical examination alone is difficult, and most cases of concrecence are found accidentally during extraction. A definite preoperative diagnosis of concrecence would contribute to a better treatment plan and fewer undesirable complications. Herein, we report a case of concrecence in the posterior maxilla involving an impacted third molar and the second molar to facilitate reasonable preoperative examinations and treatments in similar cases.

INTRODUCTION

Morphological anomalies of teeth, including talon cusp, dens evaginatus, gemination, fusion, concrecence, root dilaceration, and taurodontism, always involve changes in the enamel, cementum and dentin^[1]. Among them, concrecence characterized by the fusion of two adjoining teeth merely by cementum, is a rare anomaly, and the few related studies have shown a low prevalence ranging from 0.019% to 0.36%^[2-5].

The presence of concrecence presents challenges for surgical, endodontic, orthodontic, and even prosthodontic treatment. However, diagnosing concrecent teeth through routine clinical examination alone is difficult, and most cases of concrecence are found accidentally during extraction. A definite preoperative diagnosis of concrecence would contribute to a better treatment plan and fewer undesirable complications.

Herein, we report a case of concrescence in the posterior maxilla involving an impacted third molar and the second molar to facilitate reasonable preoperative examinations and treatments in similar cases.

CASE PRESENTATION

Chief complaints

A 47-year-old Chinese woman who complained of left maxillary first molar loss for half a year presented to the Department of Stomatology seeking treatment by dental implant restoration.

History of present illness

The patient had undergone left upper posterior tooth root extraction half a year prior, and after that, she could not chew with her left 3 molars.

History of past illness

Had histories of dental treatment and denied the history of systemic diseases.

Personal and family history

Denied personal and family history of systemic diseases.

Physical examination

The intraoral examination revealed that the maxillary first molar was lost. The maxillary second molar was mesially tilted, and only a mesial periodontal pocket with a probing depth of approximately 7 mm was observed. No abnormal mobility of the maxillary second molar was observed.

Laboratory examinations

The preoperative routine blood examination revealed no abnormalities.

Imaging examinations

The panoramic film showed angular bone defects located in the mesial aspect of the maxillary second molar. The third molar was completely impacted. The image showed an overlap between the impacted third molar and the second molar, without an obvious dividing line (Figure 1). Cone-beam computed tomography (CBCT) was recommended to determine whether there was fusion of the two molars and the spatial relationship between the root and the maxillary sinus. CBCT showed that the root apex of the third molar was located in the ipsilateral maxillary sinus. The two molars were united along the roots, and the boundary between the distal root of the second molar and the mesial root of the third molar was not clear. The two molars showed separate pulp cavity systems (Figure 2).

MULTIDISCIPLINARY EXPERT CONSULTATION

An orthodontist was consulted to determine the risk of moving the concrescent teeth to create adequate space for the expected implant prosthesis. The patient was informed of the unpredicted situation and agreed to undergo extraction of the second and third molars followed by implant restoration three months later.

FINAL DIAGNOSIS

Concrescence

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TREATMENT

Before the operation, 10 mL of venous blood was collected from the patient to prepare concentrated growth factor (CGF). The extraction was performed under local anesthesia with articaine (68 mg of articaine with 17 µg of adrenalin). The resistance to dislocation was high during the operation. A horizontal incision was created in the distal alveolar crest of the second molar, followed by flap and bone removal. Finally, the two molars were extracted completely (Figure 3). After the operation, oro-antral communication was not observed, as indicated by a negative Valsalva maneuver. The alveolar fossa was

debrided, filled with CGF, and tightly sutured. Routine antibiotics (amoxicillin capsules, 0.5 g, 3 times a day) were taken after the operation.

OUTCOME AND FOLLOW-UP

The patient returned one week later for suture removal. The wound healed well, and the patient reported no discomfort. An appointment was made for a follow-up visit three months later.

The teeth were kept for examination, serially sectioned, stained, and observed under a slide scanning system (SQS-1000, TEKSQRAY, Shengqiang Technology Co., Ltd., China). The histological observation revealed that the roots of the second and third molars were united with cementum (Figure 4), indicating concrescence of the two molars.

DISCUSSION

Tooth concrescence is a rare abnormality in which two or more teeth are joined with cementum^[6,7]. Concret teeth are rarely observed in the mandible and are more commonly observed in the posterior maxilla^[8-11]. This twinning anomaly usually occurs between the second molar and an impacted third molar or between the third molar and a supernumerary molar, in either deciduous or permanent dentition^[8,10,12-14]. Concrescence can occur during root formation due to insufficient development space (categorized as true concrescence)^[15-17]. In addition, even after complete root formation, concrescence may occur due to interdental bone resorption and cementum deposition (also known as acquired concrescence)^[15]. It has been speculated that local chronic inflammatory stimuli caused by caries, occlusal trauma and rapid orthodontic tooth movement are involved in acquired concrescence^[7,15,20,21]. In this case, thickened cementum at the junction of the two molars was found on histological examination. The first molar of the patient was extracted half a year prior and led to the mesial incline of the second molar. It is unlikely that the distal root would have converged toward the root of the impacted third molar and induced cementum deposition to such an extent in such a short period of time. In addition, no signs of chronic inflammation were found on

clinical examination. Instead, the concrescence was likely caused by space restriction and subsequent cementum deposition between adjacent roots during root development. Indeed, the limited space was also confirmed by the failed eruption of the third molar.

Clinically diagnosing concrescent teeth is difficult even with the aid of routine radiography, especially when impacted molars are involved^[20]. The identification of concrescent teeth has been reported to occur mainly during or after an extraction procedure. Thus, preoperative ignorance of this condition can lead to unexpected complications and even legal consequences due to inadequate communication. Panoramic radiography provides only vague information regarding the definite spatial relationship of the involved tooth roots. As in this case, concrescent teeth can easily be misdiagnosed as root overlap on routine radiography, undoubtedly increasing the difficulty and reliability of making a diagnosis and planning treatment^[16]. However, CBCT images can capture three-dimensional information and show positional relationships between teeth and important anatomical structures, such as adjacent teeth, alveolar bone, and maxillary sinuses^[21]. In this case, we could intuitively identify the configuration of the roots and the relationship between the roots and the maxillary sinuses by CBCT, which was very helpful for determining a feasible treatment plan and minimizing possible complications during extraction. Considering the cost and radiation of CBCT, as well as the findings of this case, we suggest that plain radiography be used for the routine examination of patients and that CBCT be used to solve problems that are difficult to solve based on plain radiography alone.

The differential diagnosis of concrescent teeth is fused teeth, which are characterized by the involvement of dentin fusion. It is difficult to distinguish whether dentine fusion is involved using CBCT, as dentin has a density of mineralization close to that of cementum. Ono *et al*^[22] performed postoperative micro-CT to differentiate concrescent teeth from fused teeth, but it seems that performing such a destructive examination before surgery is impractical. In this case, the diagnosis of concrescence was determined by postoperative histological examination. However, it must be realized that the diagnosis of fused teeth is important in cases involving endodontic treatment. As shown

in Figure 2, concrescent teeth usually have independent pulp-canal systems, which is an important distinction between concrescent and fused teeth that can be easily identified even on routine radiography^[8].

The management of concrescent teeth should be personalized, and various treatments, including extraction, surgical division, endodontic treatment and orthodontic management, have been recommended in reported cases^[11,23-25]. If the tooth concrescence does not cause aesthetic problems, functional disturbance, or other undesirable complications, no additional medical management is needed. In this case, surgical division of the concrescent teeth would have been difficult due to the high degree of root union. In addition, considering the estimated bone deficiency for orthodontic movement and the positional relationship between the root of the third molar and the base of the maxillary sinus, it was not feasible to obtain space for a first molar implant by orthodontic traction of the concrescent teeth. Accordingly, the concrescent teeth were extracted. However, the potential impact of the removal of concrescent teeth on masticatory function due to the loss of the second molar must be considered. A definite diagnosis of concrescence and a preoperative conversation can reduce the risk of legal disputes.

Clinically, patients who present with malocclusion or impacted teeth are often treated by orthodontic correction, surgery, or a combination of both, and these patients are mostly children^[26,27]. Long-term malocclusion or unilateral chewing may cause associated temporomandibular disorders; additionally, malocclusion and habitual unilateral chewing are very common in adults^[28], who are often overlooked. Therefore, clinicians should pay more attention to such conditions during the consultation, especially for adult patients, to provide relevant guidance and treatment.

CONCLUSION

Tooth concrescence is a rare clinical phenomenon that is not easily diagnosed by intraoral examination and routine radiography. Dentists should be aware of the possibility of concrescence when teeth, especially teeth in the posterior maxillary area, appear to be overlapping on imaging. CBCT is a useful tool for diagnosing and planning the

management of tooth conrescence and may be beneficial for reducing unnecessary complications.

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