

Hypercementosis and Concrescence of Maxillary Second Molar with Third Molar: A Case Report and Review of Literature

Bhavya Mohan

Academic Unit of Retorative Dentistry, Charles Clifford Dental Hospital, 76 Wellesley Road, Sheffield, South Yorkshire, S10 2SZ, United Kingdom.

Abstract

Concrescence signifies a rare developmental alteration, most commonly in maxillary molars, where two fully formed teeth with separate root canal structures are fused with cementum. Clinical detection is difficult due to lack of enamel involvement and radiographic detection may be challenging, as two dimensional images may be misdiagnosed as overlap, superimposition or close proximity of roots. Such a developmental anomaly can influence treatment outcomes for extraction, endodontic, periodontic, prosthodontic and orthodontic treatment. Legal complications could arise due to unexpected difficulties following treatment. Awareness of occurrence, incidence and post treatment implications of such anomalies is paramount for both the patient and clinician's benefit. This article discusses a case report of concrescence between two maxillary molar teeth and its management.

Clinical Relevance

Clinicians cannot make a consolidated judgment as to whether roots in close proximity are fused, overlapped or just in intimate contact based solely on an intraoral periapical radiograph [1]. A possibility of concrescence should be considered no clear demarcation of the roots can be seen, as this can help to better inform patients of possible impacts on treatment outcomes.

Objective Statement

To highlight the importance of aberrant dental anatomy and its effect on treatment planning and post treatment implications.

Introduction

Concrescence, a hard tissue anomaly in which the fully formed teeth are united by cementum [2,3], can take place between two teeth or between a tooth and a supernumerary tooth⁴. The etiology of this condition is poorly understood however, studies suggest that crowding of the dental arch, chronic irritation due to dental caries, rapid and excessive orthodontic movement and trauma can lead to resorption of the interdental alveolar bone in between two fully formed teeth and their union occurs due to deposition of cementum [5-9].

From a periodontal point of view, this fusion can lead to change in the dental anatomy and loss of gingival architecture. This, in turn, can cause plaque retention leading to periodontal problems and predisposition to dental caries. From an oral surgery perspective, treatment such as extraction may be difficult due to large mesio distal dimensions and possibility of alveolar fracture or sinus opening, which can instigate dento-legal issues for the practitioner involved. For an endodontic opinion, placement of a rubber dam clamp for isolation during endodontic procedure could be challenging.

Since the true diagnosis of this condition can only be made by a histological examination the incidence can only be described for extracted teeth. Evidence suggests that in extracted adult teeth incidence is 0.8% and in deciduous teeth 0.2-3.7% [10]. This condition is most commonly observed in

posterior maxilla but other quadrants and teeth can also be involved [11].

This article brings to light a case review of maxillary molar concrescence and its management, which was diagnosed by histological examination of teeth post extraction.

Case Report

A 30-year-old female patient was reported to the dental access center for tooth pain. She had problems with the upper right back tooth for 2 weeks and was experiencing spontaneous pain. This was aggravated on hot and cold and relieved temporarily with painkillers. Radiographs were taken at her dentist and extraction of the Upper Right 7 (UR7) was also booked. Meanwhile, the pain increased and was affecting her sleep and the patient requested an extraction on her emergency appointment.

On clinical examination patient's mouth opening was normal and a slight swelling on the right side of the cheek was observed. On percussion, UR7 was tender; deep mesial and occlusal caries were present. Six mm pocketing was present on mid and disto- buccal sites and 6 mm disto- palatally. UR8 was fully erupted and had a small occlusal carious lesion and no pain on percussion. UR8 was slightly infra-occluded. The radiograph taken by the GDP showed periapical radiolucency around the UR7 and deep caries possibly involving the dental pulp. The roots of the UR8 looked in close contact with UR7 but as such, a concrescence was hard to notice or even suspect (*Figure 1*).

The extraction procedure was explained to the patient; frequently occurring risks were discussed including post-op pain, bleeding, socket infection, possible fracture of tooth and maxillary sinus communication following which, informed consent was obtained.

The upper right side of the mouth looked crowded and posed a challenge to work in. This was managed by instructing the patient to move her lower jaw towards the right and partially close her mouth to gain good access to this region. After consent, infiltration was given (Lignocaine 2% and

Adrenalin 1:80k) and, following complete anesthesia in this region, extraction was completed with forceps.

After the extraction it was noted that the UR8 was attached to UR7 (*Figure 2*). The extraction site was inspected carefully; the maxillary tuberosity and buccal and palatal alveolar bone were intact. The Valsalva maneuver was performed to check for sinus communication and no obvious communication was noted. Pressure application was completed for five minutes, to gain hemostasis. Further to this, the sterile gauze was carefully removed and the extraction socket was managed by placing Surgicel® (hemostatic agent) and sutures. This led to good hemostasis and the patient was given postoperative instructions.

The patient was shown the fused teeth and explained that this condition is rare and it was not possible to diagnose this or avoid the loss of the UR8 as radiographs, which are two-dimensional, can seem like an overlapping image prior to the procedure. The patient was also advised to take photographs of the teeth on her mobile phone for her records, though was happy that her wisdom molar was also extracted as she thought that this tooth could have given her problems in future. No postoperative complications were noted.

The patient agreed to retain the extracted teeth for a histological examination, which was completed for a definitive diagnosis.

Histological Findings

After fixing the teeth in 4% buffered formalin, a histological analysis was completed by sectioning the teeth sample. This showed decalcified sections of the permanent teeth UR7, UR8 (*Figure 3*).

The UR7 showed normal dentine formation with a carious cavity at the mesial aspect and several aggregations of bacterial colonies throughout. The pulp chamber had reduced in size and a pulp stone was present. The canal system was obliterated and there was marked hypercementosis. Thick cellular cementum with layered appearance noted by the growth/resting lines was seen on the root [12]. The UR8 showed normal coronal dentine structure with an area of bacterial aggregation. The pulp chamber contained several small calcifications with reticular degeneration but appeared



Figure 1. Pre Op Intraoral periapical radiograph of UR7 and UR8. Periapical radiolucency and hypercementosis of the UR7 root is noted, mesial caries in UR7 involving pulp are present, but a fusion of the UR7 and UR8 roots is not clear.

vital. Cellular cementum appeared to connect the root of the UR7 to the amelo- cemental junction of the UR8. These features suggested concrescence.

Based on histopathologic findings, the final diagnosis was hypercementosis and concrescence of UR7 and UR8.

Discussion

Differential diagnosis of cemental anomalies

Root cementum is a dynamic tissue and exhibits compensatory thickening during the human life to counteract tooth wear. This has been seen to differ between tooth groups and tooth surfaces. In a study conducted with an average age of patient at 42 years old (more than 22,000 patients), an incidence of 1.7% single tooth hypercementosis was noted. Whilst mandibular molars were the most commonly effected teeth [13], furcation areas of multi-rooted teeth, anatomical grooves and concavities on roots were the most frequently effected sites [14].

As such cementum does not remodel like bone but it is seen to resorb under trauma or tensional forces. In the case of noninfectious localized trauma, cementum is seen to repair itself through the formation of cellular cementum by migration of cementocytes in the area [14]. However, if the trauma is severe or has an infective component, root resorption can take place but it has never been demonstrated that hypercementosis is a direct consequence of this succession of events [15].

The above patient had localized hypercementosis possibly caused due to crowding of the upper right quadrant and chronic irritation due to caries. No other anomalies of teeth were noted in her case. However, generalized hypercementosis, all be it rare, can also be observed. The etiology of generalized hypercementosis has been put down to hereditary and systemic conditions such as Paget's disease, thyroid goiter, rheumatic fever, rheumatoid arthritis and acromegaly [16]. In contrast to the aforementioned conditions in Paget's disease the periodontal ligament space is also obliterated and the teeth are often ankylosed to the bone exhibiting external resorption [17].

The intra oral presentation of fused teeth can be varied. Fusion could take place between two teeth [18], teeth with supernumerary teeth [19] or tooth and unerupted tooth crown [20]. While, concrescence is often described as a late cemental union of teeth after they are fully formed, germination (single tooth bud partially divides into two) and fusion (separate tooth buds partially fuse into one tooth), on the other hand, are considered as early developmental anomalies or fusions of unknown etiology [21]. While germination and fusion are easier to see and hence diagnosed due to the enamel involvement, concrescence can be harder due to cemental

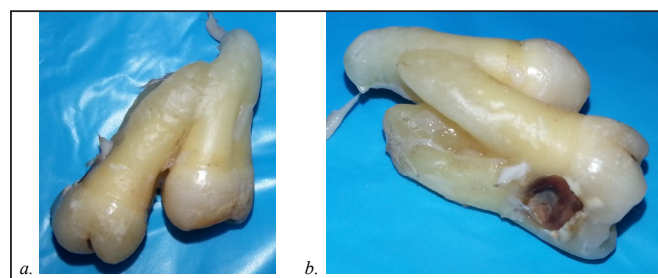


Figure 2. UR7 and UR8 fused along the root length with cementum. Hypercementosis can be noted at the root apices.

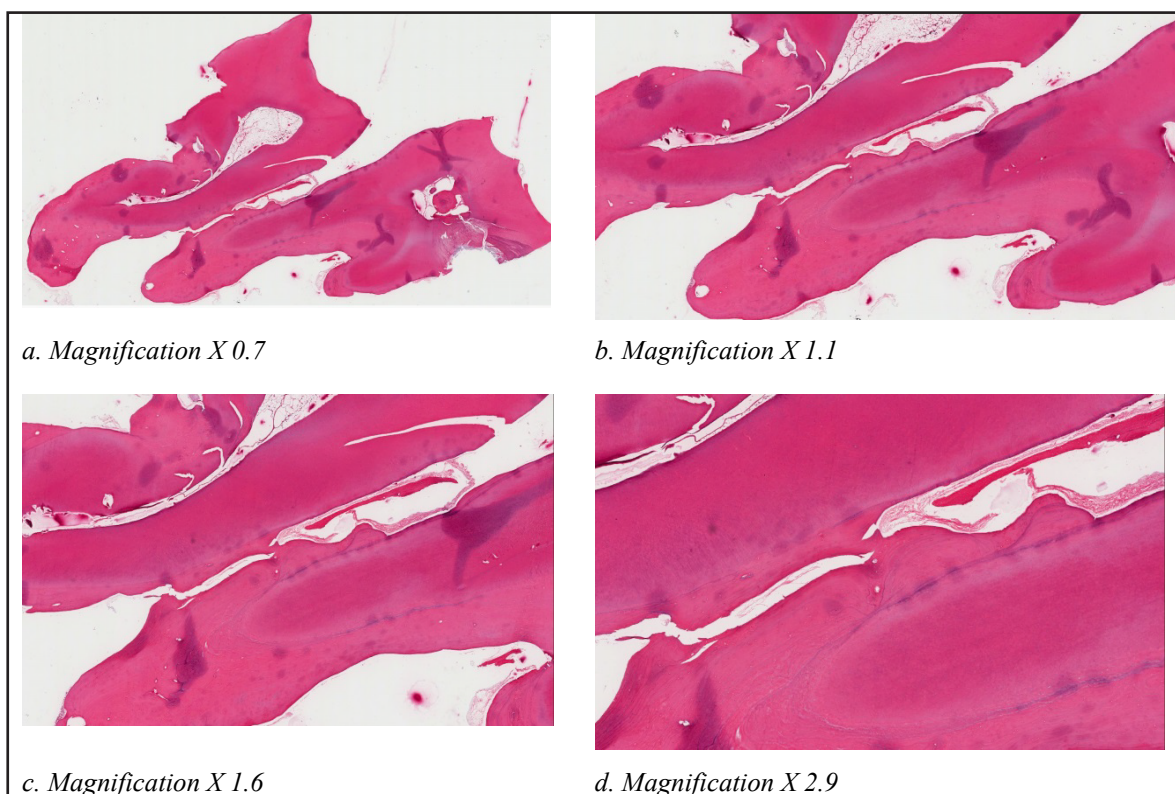


Figure 3. Histologic section of UR7 and UR8 confirming the cemental union of the teeth (a, b, c, d). Thickened cellular cementum (c) with growth and resting lines can be noted (d).

union being hidden away sub-gingivally in most cases. Literature suggests many occasions where this condition was not diagnosed until after extraction [15,18]. Fracture of the tuberosity or alveolus or an extended oro-antral perforation are recognized dangers if this is not diagnosed prior to extraction [15]. If a fusion is detected it is important for the clinician to examine other areas of the mouth to check the number of teeth present and any other fusion. Also, depending on the age of the patient and other clinical findings, if other complications are suspected (such as Paget's disease), a radiographic examination to check the root apices of teeth may be warranted. This may aid diagnosis of hypercementosis, resorption of roots or obliteration of periodontal ligament spaces or external resorption.

However, in the present case, for a 30-year-old female with no health issues, normal appearance and a count of all teeth, an orthopantomogram was not deemed necessary. Moreover, localized chronic irritation and crowding in the upper right quadrant was considered most likely to have caused the hypercementosis and concrescence.

Management modalities

If a large cemental union or fusion is suspected clinically and radiographically, then another radiograph with an altered angulation or cone-beam computerized tomography can be applied for effective treatment planning [15]. While the fusion can be minimal in some cases and the teeth sectioned easily, it can be challenging in other cases where the fusion is more advanced and solid cemental mass along the entirety of the

root is present. The preservation and avoidance of iatrogenic damage to the retained tooth and alveolar bone is key. Nevertheless, sectioning of teeth with concrescence has been successfully completed in a case where 4 teeth (UL4,5,6,7) had cemental fusion. This was completed in order to retain premolars (UL4,5) and circumvent the loss of occlusal support [15].

Also, another study suggested sectioning and removal of the fused supernumerary teeth by raising a surgical flap and bone, and radicular recontouring of the retained tooth with careful consideration to the alveolar bone so as to protect its periodontal apparatus [19]. In cases of concrescence of wisdom molars, extraction is often the best treatment modality due to difficult access for flap surgery and separation of teeth [15,19].

Conclusion

In light of the above discussion, if the radiograph suggests the possibility of indistinguishable roots of two teeth or thickened root apices, the likelihood of concrescence should be highlighted to the patient. Every effort should be made to retain vital teeth in the dental arches and fused teeth should be managed according to the clinician's experience or referred, if necessary. However, due to diagnostic difficulty if this is discovered post extraction, the clinician should be aware of possible odontogenic anomalies. Hemostasis and socket management along with thorough appraisal of the situation to the patient is a key to good patient management.

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