Concrescence and Periodontitis: A Case Report
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Citation

Abstract
Concrescence of a tooth is a condition showing union of adjacent teeth by cementum. The major variant in this case report is a concrescence between a supernumerary tooth (paramolar) with a permanent tooth. As a result of this paramolar concrescence, the gingival architecture was lost which created funnels for the accumulation of plaque and resulted in severe periodontitis. This case was successfully treated by sectioning the paramolar. Awareness of these developmental disturbances with proper diagnosis and treatment is very essential because it can compromise the periodontal attachment and can lead to tooth loss.

INTRODUCTION
Periodontal disease is multi-factorial in etiology of which the bacteria are the main factors contributing to the disease process. In addition several conditions exist around the teeth that may predispose the periodontium to disease, like position of the teeth, tooth or root anatomy which enhance bacterial accumulation or allow the ingress of bacteria in the periodontium. A number of local factors in the gingival environment act as site-specific problems which predispose towards the accumulation of plaque deposits and prevent their removal. These are called plaque retention factors (1). Accordingly the local plaque retentive factors (1) are tooth anatomic factors and iatrogenic factors. Tooth anatomic factors include cervical enamel projection, enamel pearl, developmental grooves such as palate-gingival groove, root proximity and open contacts. Iatrogenic factors are tooth restorations having marginal discrepancies, overhanging restorations and subgingival margin placement. Others include root fracture, cervical root resorption and cemental tears.

Local etiologic factors as described above may prevent the removal of subgingival plaque and may even contribute to destruction of the periodontal tissues. Thus, it is crucial to be able to recognize and eliminate any plaque-retentive factor that could contribute to disease progression. Iatrogenic factors such as subgingival margins, restorative overhangs, overcontoured restorations and unpolished surfaces can be altered (1). Similarly, cervical enamel projections, enamel pearls and in certain instances, palatal grooves can be removed or recontoured to enable the patient to access the area for good plaque control.

Concrescence is a developmental anomaly of dental hard tissues. Based upon the morphology and the number of teeth in the affected dentitions, dental anomalies are classified as the product of fusion, gemination and concrescence (Tannenbaum & Alling(2) 1963, Pindborg 1970 (3)). Their incidence (4) in deciduous dentition is 3.7%, permanent dentition is 0.8%.

Gemination implies a double tooth originating from one dental follicle as the result of an incomplete splitting into 2 teeth, starting at the incisal edge but aborted before cleavage is complete (5). No matter what the changes are, there is mostly only a single root with only one root canal. Clinically these teeth present as a bifid crown with a well defined groove or an incisal notch delineating the two crowns. In contrast, fusion indicates a union of discrete tooth germs during odontogenesis, (6) the extent and localization of the union depends on the developmental stage of the teeth at the time of the fusion. In most cases the result is a broad tooth with two separate pulp chambers and root canals. Often there is a hereditary pattern associated with fusion. Fusion tends to be reported more frequently in the deciduous dentition, especially in the incisor region (7). When fusion occurs at the cementum level, concrescence is said to be responsible. It is more frequently noted in maxillary molars. It can occur between normal molars, a normal molar and a supernumerary molar, and in both erupted and impacted teeth (8). Concrescence may occur during root formation or after the radicular phase of development is completed. Although the exact etiology is unknown, it is thought to result from trauma or from crowding of adjacent teeth such that the interdental bone resorbs, allowing the adjacent tooth
roots to become fused by the deposition of cementum between them (9). It has also been postulated to result from an inflammatory response, for example, to a carious lesion which causes cemental deposition and ultimately attachment to the root of the adjacent tooth. The amount of union may vary from one small site to a solid cemental mass along the entire extent of approximating root surfaces. The literature has not described any age, race or gender predilection with concrescence (10).

Most of these problems require periodontal treatment to repair or regenerate the damaged periodontium after correction of the tooth related problem. In some cases, exploratory surgical procedures are needed to clarify the etiology of the lesion.

A CASE REPORT

A 45-year-old male visited the department of periodontics with the chief complaint of food impaction in the maxillary left second molar tooth. The patient’s medical history and dental history were non contributory. Intraoral clinical examination revealed generalized gingival inflammation and bleeding on probing. The morphology of the upper second molar was irregular with two extra cusps associated with mesiobuccal cusp of 15. These extra cusps were conical in shape. One of the extra cusp was carious. (Figure 1, 2)

The morphology of the extra cusps gave an impression of a supernumerary tooth which was fused to the permanent second molar. Between the cusps a deep groove extending from the cementoenamel junction (CEJ) and a 10 mm pocket was present. The morphology of the tooth was altered as a result the normal gingival architecture was lost which created funnels for the accumulation of plaque. There was no sign of any mobility. The tooth was vital on vitality testing.

**Figure 1**

Figure (1) Occlusal view showing the extra cusps in relation tooth no 15. Note the morphology of the tooth is altered

**Figure 2**

Figure (2) Buccal view of the extra cusps. One of the cusp is decayed. Note the groove between the two cusps

**RADIOGRAPHIC EXAMINATION**

The periapical radiograph (Figure 3) did not reveal the presence of extracusp/groove because of superimposition on the permanent molar. Another radiograph with different angulation and placement of gutta-percha between the grooves (Figure 4) was made to determine the depth and extension of the groove. Accordingly a depth of 12mm was recorded.
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PROVISIONAL DIAGNOSIS

Based on the available information a provisional diagnosis of fusion of a supernumerary paramolar with the permanent molar was made. Accordingly a treatment plan was developed to eliminate solely the local factors, the extra-cusps and groove. On raising full thickness mucoperiosteal flap (Figure 5), a three walled defect distally to the apex of 15 with complete loss of buccal plate was observed. The extra-cusps had their own roots which were fused to 15.

DIAGNOSIS

Concrescence of a supernumerary paramolar with the left permanent second molar.

TREATMENT

Access flap was reflected and the area was debrided using 9/10 gracey curette. Odontoplasty of supernumerary paramolar was performed to establish an anatomy consistent with the normal molar. (Figure 6). A root canal associated with the supernumerary tooth was isolated (black arrow in Figure 6). This part of the paramolar was retained as its removal could lead to compromised tooth structure of 15. Obturation of the canal was planned and accordingly the canal was debrided at the same time.
Intrabony defect was treated by hydroxyl apatite with collagen osseous graft (G bone#) (Figure 7) and a resorbable collagen membrane placed (Figure.8). The flap was sutured using black braded silk suture and a non eugenol periodontal pack (coe pack*) was given. After 10 days the sutures were removed. Post operatively the patient did not complain of any discomfort with the tooth and the healing was satisfactory.

After three weeks the vitality test was repeated, 15 showed delayed response. Endodontic treatment was carried out. The three root canals did not have any communication with the root canal of supernumerary tooth (Figure10). All the four canals were obturated with gutta-percha (Figure10). The tooth was restored with permanent crown four weeks after obturation (Figure 11). On follow up visits there was good healing of the tissue. After three months follow up there was reduction in probing depth i.e. 3mm and the healing was satisfactory.
DISCUSSION

This case report presented concrescence between the supernumerary paramolar and permanent second molar which resulted in severe localized periodontal attachment loss including pocket formation and alveolar bone loss. The aim of the present case report was to describe the treatment approach aimed at eliminating the paramolar, regenerating the periodontal attachment and bone loss and prevent bacterial recolonization of the defect associated area.

Concrescence is clinically nearly impossible to be detected. Due to lack of enamel involvement, the crowns of the affected teeth, if erupted, appear normal. Concrescence may defy radiographic detection as well; they may be misdiagnosed as simple radiographic overlap or superimposition of teeth. Additionally, a normal amount of cementum involved in the concrescence may also contribute to an inaccurate diagnosis. A diagnostic consideration, but not a rule is that supernumerary teeth are often slightly aberrant and present a cone shaped clinical appearance. Thus fusion between a supernumerary tooth and a normal tooth will generally show difference in the two halves of the crown.

Some of the tooth anomalies in periodontal literature which have resulted in severe periodontitis and tooth loss include enamel pearl (11), palatoradicular groove (12), mandibular disto-lingual root (13), fused teeth (14) and dens in dente (15). All these unfavorable anatomic factors are successfully eliminated and treated utilizing interdisciplinary approach. This case of concrescence between supernumerary paramolar and the permanent molar is very rare and to our knowledge this is the first case reported in the periodontal literature where concrescence is one of the local etiologic factors for localized periodontal destruction. In cases of fusion the factors to be considered in detail before planning the treatment is the presence of normal complement of teeth, level of separation of fusion of tooth, depth and extent of caries, level of co-operation/ motivation of patient and in children, age of the patient (16).

The morphology of fused teeth is so varied that can only outline possibilities. If normal complements of teeth are present and fusion does not extend apically, sectioning can be attempted. This is done by raising a flap and drilling the required amount of bone. While sectioning, cutting should be done, naturally at the expense of the tooth to be removed. Subsequent recontouring of the retained root may also be carried out at the same time to forestall periodontal complication. Bone removal should be minimal so as not to compromise the attachment apparatus of the retained root. The iatrogenic defect due to section can be treated orthodontically by moving the tooth into the defect (17). If typically a tooth is missing the option of recontouring the tooth with composites or by crowns will be needed for esthetics. In cases of third molars then best treatment is extraction.

In this present case the presence of cemental fusion of a supernumerary paramolar with the mesiobuccal cusp of permanent molar resulted in the loss of gingival architecture, which created funnels for accumulation of plaque. The tooth was vital so treatment was solely aimed at elimination of the local plaque retentive factor and regenerating the lost...
periodontium by bone graft and guided tissue regeneration.

After three weeks with subsequent vitality test the permanent tooth became non vital so endodontic treatment was carried out. The cause for loss of vitality of the tooth may be due to caries or trauma, as there was no communication of root canals between the supernumerary tooth and the permanent tooth. After endodontic treatment the tooth was restored with the permanent restoration.

Early diagnosis of these tooth anomalies is an important part of a treatment and thus we can improve the prognosis of a tooth and minimize periodontal involvement.

CONCLUSION

Conservation of teeth is the main philosophy of today’s practice. Knowledge of different tooth anomalies, their significance in etiopathogenesis of caries and periodontal disease and treatment modalities during exodontia, periodontics and endodontics should be taken care.

References

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