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Unusual Calculus Mass in Floor of Mouth: A Case Report

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ABSTRACT

A variety of conditions though they are not separate disease entities are associated with poor oral hygiene. Dental calculus is a common finding. However, rarely does a calculus with such an enormous size does comes across. Conditions which make plaque removal difficult and favour formation of dental calculus are referred to as *predisposing factors* and these should be considered. The following case report describes the presentation of a huge mass of calculus in the floor of the mouth. After removal, lingually present horizontally tilted premolar was seen. Biochemical analysis of the specimen detected calcium and phosphate ions similar to that in calculus. Hence it was diagnosed as calculus.

Keywords: Dental Calculus, Saliva, Calcium phosphate, Floor of mouth, Biochemical analysis

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Introduction

Calculus is a hard concretion that forms on teeth or dental prostheses through calcification of bacterial plaque.[1] In early 19th century the Greek term "Tartar" was used to refer to calcium phosphate on teeth.[2]

Calculus is of two types. It is termed supragingival if it is formed above the gingival margin and subgingival if formed below gingival margin.[3] The two most common locations for supragingival calculus to develop are the buccal surfaces of the maxillary molars and the lingual surfaces of the mandibular anterior teeth.[4] Saliva from the parotid gland flows over the facial surfaces of upper molars via Stensen's duct, whereas the orifices of Wharton's duct and Bartholin's duct empty onto the lingual surfaces of the lower incisors from the submaxillary and sublingual glands, respectively. [4] The first areas to exhibit calculus deposits were the facial aspects of maxillary molars and the lingual surfaces of mandibular incisors and a maximal calculus score was seen around 25 to 30 years of age.[5] Supragingival calculus consists of 70% to 90% of inorganic component chiefly composed of 75.9% calcium phosphate, and atleast two thirds of which is crystalline in structure.[6] The four main crystal forms are: Hydroxyapatite 58%, Magnesium whitlockite 21%, Octacalcium phosphate 12%, Brushite 9% approximately. Hydroxyapatite and octacalcium phosphate are detected most frequently in all supragingival calculus and constitute the bulk of the specimen.[6] The organic component of calculus consists of a mixture of protein-polysaccharide complexes, desquamated epithelial cells, leukocytes, and various types of microorganisms.[7] Between 2-9% of the organic component is simple carbohydrate, 6-8% salivary proteins and 0.2% of lipids.[7] The calculus attaches to the tooth by 4 modes.[3,9] Firstly by means of an organic pellicle on enamel, second by mechanical locking into surface irregularities, such as resorption lacunae third by close adaptation of calculus undersurface depressions to the gently sloping mounds of the unaltered cementum surface and finally by penetration of calculus bacteria into cementum.[9] Formation of calculus begins by precipitation of mineral salts into the soft plaque which usually starts between first and fourteen days of plaque formation, saliva being the source of mineralization for supragingival calculus.[9,10]

Calculus provides site for plaque accumulation which is the major etiologic factor in periodontal disease. Calculus accumulation provides an environment that makes plaque removal difficult. Other conditions also make plaque removal difficult and as such are referred to as *predisposing factors.*[3,8]

This case report aims at presenting a case of a huge, atypical hard swelling seen in the floor of the mouth resembling calculus with the predisposing factor being crown of the premolar present in the floor of the mouth.

Case Report

A 35 year old male reported to the department of periodontics, M.S.Ramaiah dental college and hospital complaining of swelling in the lower front portion of jaw below the tongue since one year. The patient described that swelling was initially small and grew to the present size over a period of one year. When small, it never interfered during normal activities such as eating, brushing and talking but presently it was disturbing the above activities. It felt hard to tongue and was not associated with pain, bleeding or sensitivity. However there was bleeding of gums from the other areas occasionally.There was no significant medical history. His dental history revealed

that it was his first dental visit. The patient used his finger along with paste to clean his teeth as the use of brush would cause bleeding, he also used lukewarm salt water for gargling.

On intra oral examination, there was generalized deposits present associated with generalized bleeding and inflammation of the gingiva. There was generalized pocket formation with grade I mobility in reation to 31,41. (Fig.1) Patient's oral hygiene was poor. A root stump was present in relation to 45. On the lingual aspect of the mandibular anteriors there was a large swelling in the floor of the mouth extending from left first premolar 35 to the opposite side upto the mesial aspect first molar 46. The swelling was away from the lingual attached gingiva of 35, 34, 33, 32, 31 by 6mm and on the right side by about 3mm away from marginal gingiva in relation to 41,42,43,44 indicating swelling slightly towards the right side from the midline. (Fig. 2) The swelling extended about 16mm transversly or buccolingually from premolar to premolar and 9mm anteroposteriorly along the midline. (Fig 3) The colour was pale yellow to greyish with smooth surface and glossy in appearance. On palpation it was non tender, hard in consistency extending into the floor of the mouth on all sides.

Based on the history and the clinical findings, overall diagnosis of chronic generalized periodontitis was made, and provisionally the swelling was referred to as calculus mass with a differential diagnosis of submandibular sialolith.

Ultrasonic scaler along with sickle scaler was used and the mass came out in big chunks to reveal a lingually tilted 2nd premolar 45 lying in the floor of the mouth.(Fig. 4, 5 & 6) The mass was sent for biochemical analysis. The report of specimen showed calcium 43.2%, inorganic phosphate 18.87% and calcium phosphate 79.32%. Depending upon history, presentation and biochemical report the diagnosis of calculus was considered. The patient was informed about the tooth and a treatment plan was made to extract the tooth and to undergo a thorough oral prophylaxis. Oral hygiene instructions were given. Chlorhexidine 0.2% mouth wash was prescribed and was recalled for regular visits.

Discussion

Dental calculus is calcified dental plaque, composed primarily of calcium phosphate mineral salts deposited between and within remnants of formerly viable microorganisms. Levels of calculus and location of formation are affected by oral hygiene habits, access to professional care, diet, age, ethnic origin, and time since last dental cleaning, systemic disease and the presence of plaque retentive factors.12 In populations that practice regular oral hygiene and with access to regular professional care, supragingival dental calculus formation is restricted to tooth surfaces adjacent to the salivary ducts. . In populations that do not practice regular hygiene and that do not have access to professional care, supragingival calculus occurs throughout the dentition and the extent of calculus formation can be extreme. Few cases have been reported. Taiwo in 2003 has reported a giant calculus on the right side of the mouth associated with poor oral hygiene.[11] A similar case with a huge mass of calculus was reported by Kothiwale in 2010 which was attributed to absolute negligence of oral hygiene.[13]

Various theories of mineralisation of calculus have been proposed. One of the theories states that the level of carbon di oxide present in saliva, which leaves the ducts of the salivary glands, is considerably higher than that found in the saliva in the mouth. This difference will result in the escape of carbon di oxide from saliva, resulting in a

rise in pH. When the pH of saliva rises it cannot hold much calcium and phosphate ions in solution, therefore spontaneous precipitation occurs.[10] Another theory states that ammonia production results in a rise in plaque pH because it has been shown that rapid calculus formers have an increase in urea concentration in their saliva. Also breakdown of proteins in plaque might result in the local production of urea and subsequently ammonia. This in turn leads to a rise in the pH of plaque which would induce the local precipitation of calcium and phosphate ions.[10] The epitaxis or nucleation theory proposes that crystallization is nucleated by a compound of different chemical composition, although the compound supposed to start crystallization has not yet been identified. However, micro organisms degenerating under experimental conditions have been shown to form calcium phosphate crystals of the same type as those seen in calculus.[3, 10]

In the present case, the supragingival calculus was observed in the floor of the mouth behind the ingival surfaces of the incisor and the premolar teeth was observed. Dental calculus falls in the group of plaque retention factors which modify the form of the clinical crown of the tooth, rendering plaque inaccessible to the patient during routine brushing. The reason it had become huge hard calcified mass in that region was the presence of the crown of the premolar which lay in the floor of the mouth could be the predisposing factor for the deposition of the calcified mass. There was a root stump or grossly decayed retained deciduous lower right second molar i.e.. tooth 85, which has lead the lower right second premolar i.e.. 45 to incompletely erupt in a more lingual position to lay in the floor of the mouth.

Since the ductal opening of submandibular and sublingual salivary glands was near to the calculus, further deposition of calcium and phosphate ions was possible in the present case. Also the submandibular salivary gland has thick viscous salivary secretion which also can be considered as the reason for getting more and more deposit of calculus in the floor of the mouth.

Furthermore, the poor oral hygiene, lack of professional care have added to the magnitude of the existing problem. This explains the location and size of the giant calculus. Because of unusual location of calculus this case can be considered as unusual case.

Conclusion

Early diagnosis of predisposing factor for initiation of calculus is very important. In the present case, presence of crown of the premolar in the floor of the mouth was the predisposing factor for the initiation of calculus formation and further mineralization of it was possible due to its location near the ductal opening of the right sublingual and submandibular glands.

Periodic recall visits of patient not only for supervising the maintenance of oral hygiene, but also to check for presence of any tooth which is out of alignment, not in function and other predisposing factors are also important. If proper attention is not paid to such plaque retentive factors it may be prone to have calcified masses in oral cavity due to mineral deposition.

References:

1. Glossary of Periodontal terms. 2001, 4th edition, American Academy of Periodontology. Page 7
2. http://www.etymonline.com/index.php?term=tartar&allowed_in_frame=0
3. Newman et al, Carranza's clinical periodontology. 10/e, Chapter 10, 170-178.
4. Dawes C: Recent research on calculus, NZ Dent / 94:60, 1998.

5. Anerud A, Loe H, Boysen II: The natural history and clinical course of calculus formation in man, J Clin Periodontal18:160, 1991.
6. White D: Dental calculus: recent insights into occurrence, formation, prevention, removal and oral health effects of supragingival and subgingival deposits, Eur J Oral Sci 105:508, 1997.
7. Mandel I: Histochemical and biochemical aspects of calculus formation, Periodontics 1:43, 1963.
8. Jan Lindhe, Thorkild Karring, NiklausP Lang Clinical Periodontology and Implant Dentistry; 5th edition; 8:197-203.
9. Muhlemann H, Schroeder H: Dynamics of supragingival calculus formation, Adv Oral Biol 1:175, 1964.
10. Walsh.T, Figure K.H, Lamb DJ, Clinical Dental Hygiene. Butterworth Heinemann Ltd;1992; 56,57.
11. Taiwo J.O, Shodeinde B: Giant Calculus in the mouth of a partially edentulous women. Case report; Nigerian Journal of Clinical Practice June 2003, Vol 6(1); 74-77.
12. White DJ :Dental calculus: recent insights into occurrence, formation, prevention, removal and oral health effects of supragingival and subgingival deposits. Eur J Oral Sci. 1997 Oct; 105(5 Pt 2):508-22.
13. Shaila Kothiwale, Dwiti Thanawala, Anil Malleshappa; Magnitude of oral health negligence. A case report. Journal of International Oral Health. Dec 2010, Vol.2-4; 94-100.

Appendix: Pictures/Figures

Figure 1: Labial view

Figure 2: Lingual view

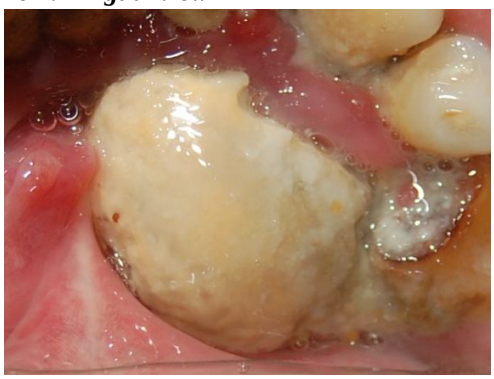

Figure 3: Close up view of swelling similar to calculus

Figure 5: Calculus chunks removed

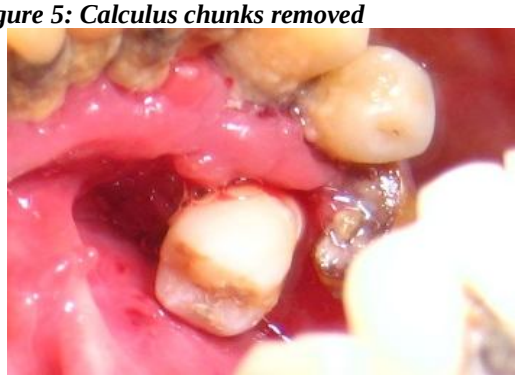

Figure 6: Immediate post operative view revealing lingually tilted premolar into floor of mouth