



## A RADIOGRAPHIC CORRELATION BETWEEN SMOKELESS TOBACCO AND PULP STONE

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### ABSTRACT

**Aim:** The purpose of this study was to determine the correlation between smokeless tobacco and pulp stones by the use of radiographs.

**Patients and Methods:** 200 Intra Oral Periapical Radiographs were selected from 200 different patients visiting the KVG Dental Colleges & Hospital to check the pulp stones. Out of these 100 were chewers of tobacco products while 100 were non chewers of tobacco.

**Statistical Analysis:** Chi-square analysis was used to compare the frequency of occurrence of pulp stones between tobacco chewers and non tobacco chewers.

**Results:** Out of 100 radiographs examined among each groups, 11 cases of pulp stone were found in chewers, while 2 cases of pulp stones could find in non chewers.

**Conclusion:** Positive correlation was found between tobacco chewers and pulp stones.

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## INTRODUCTION

Pulp stones are discrete calcifications and are amongst changes that include more diffuse pulpal calcifications such as dystrophic calcification. Johanson and Bevelander stated that stones may exist freely within pulp tissue or it may be attached to, or embedded in dentin. A single tooth may have stones ranging from 1 to 12 or even more, with sizes varying from minute particle to large masses that occlude the pulp space.<sup>(1)</sup> The prevalence of pulp stones in teeth, based on radiographic examination, has been reported to be around 20–25%, while histological examinations reveal higher percentages. Many etiological factors have been claimed to pre-dispose pulp stone formation such as aging, caries, operative procedures, periodontal disease and epithelial rest in pulp tissue.<sup>(2)</sup>

The habit of chewing betel (or areca) nut is a habit of great antiquity. Its use is globally acceptable among all sections of society, including women and quite often children.<sup>(3)</sup> Four factors form the foundation for the popularity of chewing betel nut are: Social acceptability, religious beliefs, perceived health benefits, and addiction.<sup>(4)</sup> Betel nut is the fourth most commonly used psychoactive substance in the world after caffeine, alcohol, and nicotine. Betel nut is present in a number of chewing products like mawa, paan, gutkha, khaini, and paan masala. Reasons for using betel nut include achieving euphoria, combating fatigue, increasing salivation, attaining satiation, and even seeking relief of toothaches.<sup>(5,6)</sup>

Chewing betel nut on a habitual basis is known to be deleterious to human health.<sup>(7)</sup> The World Health Organization and International Agency for Research on Cancer classified betel nut as a group 1 human carcinogens.<sup>(8)</sup> The International Agency for Research on Cancer considers paan and gutkha as substances containing known human carcinogens, of which the betel nut is believed to be the main culprit.<sup>(9)</sup> A growing body of evidence over the last 40 years, mainly in the form of large-scale epidemiological and experimental studies, has shown that even when consumed in the absence of tobacco or lime betel may have potentially harmful effects on the oral cavity. These effects can be divided into two broad categories: Those affecting the dental hard tissues, which include teeth, their supporting periodontium and the temporomandibular joint (TMJ) and the soft tissues, which make up the mucosa that lines the oral cavity.<sup>(10)</sup>

### Effects on Hard Tissues

#### Excessive tooth abrasion and fractured teeth

The hard fibrous nature of the betel nut causes fractured teeth and extensive abrasion of the occlusal tooth surface of regular users. The molars, premolars, and canine teeth frequently completely lose their cuspal form and the incisors become shortened.<sup>(11)</sup> The loss of enamel may also expose the underlying dentine and as this is softer than enamel wears at an increased rate. The exposure of dentine may also result in dental sensitivity.<sup>(12)</sup> The degree of attrition is dependent upon several factors, which include the consistency (hardness) of the betel, the frequency of chewing, and the duration of the habit. Root fractures have also been demonstrated in chronic betel chewers and this is likely to be a consequence of the

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increased masticatory load that is placed upon the teeth and is not direct effect of betel.<sup>(13)</sup>

Much concern has been expressed over the effects of smokeless tobacco on the mucous membranes of the oral cavity, particularly the increased risk of oral cancer. This is indeed a major problem. However, the possibility of direct damage to the dentition by materials found in smokeless tobacco and cigars also should be a concern. Several authors have reported excessive dental attrition in users of oral forms of tobacco. When teeth are gradually worn away by abrasion, the tooth normally forms secondary dentin; when teeth are exposed to increased amounts of abrasives, the secondary dentin is also worn down. In extreme cases, the entire clinical crown may be worn away<sup>(14-18)</sup>.

**MATERIALS AND METHODS**

The present study was undertaken at the Department Of Conservative Dentistry and Endodontics, KVG dental college, Sullia after due approval of the ethical committee. 200 Intra Oral Periapical Radiographs were selected from 200 different patients visiting the hospital to check the pulp stones. Out of these 100 were chewers of tobacco products while 100 were non chewers of tobacco.

**Inclusion Criteria**

- Age group from 20-55 yrs.
- Both maxillary and mandibular posterior teeth.

**Exclusion Criteria**

- Teeth having dental caries.
- Age group beyond 55 yrs.
- Teeth which have restorations.
- Teeth having internal resorption.
- Teeth having external resorption.

**Statistical Analysis**

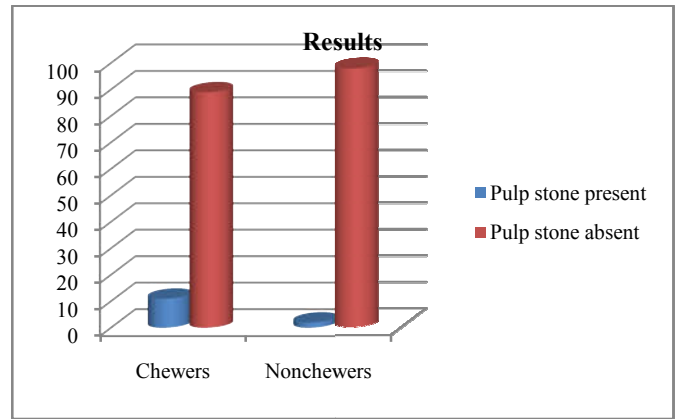
Chi-square analysis was used to compare the frequency of occurrence of pulp stones between tobacco chewers and non tobacco chewers.

Control Vs Chewers Cross tabulation				
		Count		
		chewers		
		no pulp stone	pulp stone present	Total
control	no pulp stone	89	9	98
	pulp stone present	0	2	2
Total		89	11	100

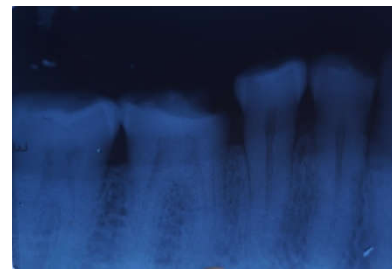
Chi-Square Tests					
	Value	Degree of Freedom	Asymptomatic Significance (2-sided)	Exact Significance (2-sided)	Exact Significance (1-sided)
Pearson Chi-Square	16.512 <sup>a</sup>	1	.000		
Continuity Correction	8.538	1	.003		
Likelihood Ratio	9.177	1	.002		
Fisher's Exact Test				.011	.011
Linear-by-Linear Association	16.347	1	.000		
N of Valid Cases	100				

**RESULTS**

Out of 100 radiographs examined among each groups, 11 cases of pulp stone were found in chewers, while 2 cases of pulp stones could find in non chewers.



Correlation between tobacco chewers and pulp stones



Pulp stones were found in 11 cases out of the 100 radiographs examined. The teeth of tobacco chewers showed a higher prevalence of pulp stones than the non tobacco chewers with the differences in occurrences being statistically significant (P<0.001).

**DISCUSSION**

In this survey we evaluated the presence of pulp stones using IOPAR.

Calcified bodies in the pulp cavity could be visualized clinically through radiographs. The radiographically observed incidence of pulpal calcification was substantially lower than the observed incidence<sup>(19,20,21,22)</sup>. It was reported that the diameter of the calcified body should be more than 200um to be seen radiographically<sup>(23)</sup>.

Calcification may be diffusely distributed in the pulp cavity or be localized in the form of pulp stones. It is very important when histologically examining the pulp tissue for the presence of pulp stones, not to use only a small number of sections through a given tooth, in order not to miss calcified structures if present<sup>(24,25)</sup>.

The prevalence of pulp stones in this study was found to be higher in the first molars than in the second molars and premolars. Similar findings were reported by other investigators. A probable explanation is early eruption of the first molars. In addition, it contains large amount of pulp tissue and better blood supply compared to other teeth<sup>(19,20)</sup>. The hard fibrous nature of the betel nut also causes fractured teeth and extensive abrasion of the occlusal tooth surface of regular users.<sup>(11)</sup> It was stated by several investigators that any irritation to the pulp like attrition will lead to a deteriorious influence on the pulp.<sup>(19,20)</sup>

**CONCLUSION**

Positive correlation was found between tobacco chewers and pulp stones.

**Referances**

1. Johnson PL, Bevelander G. Histogenesis and histochemistry of pulpal calcification. *J Dent Res* 1956;35:714-22.
2. Ranjitkar S, Taylor JA, Townsend GC. A radiographic assessment of the prevalence of pulp stones in Australians. *Aust Dent J* 2002;47:36-40.
3. Lan TY, Chang WC, Tsai YJ, Chuang YL, Lin HS, Tai TY. Areca nut chewing and mortality in an elderly cohort study. *Am J Epidemiol* 2006;165:677-83
4. Auluck A, Hislop G, Poh C, Zhang L, Rosin MP. Areca nut and betel quid chewing among South Asian immigrants to Western countries and its implications for oral cancer screening. *Rural Remote Health* 2009;9:1118
5. Pindborg JJ, Sirsat SM. Oral submucous fibrosis. *Oral Surg Oral Med Oral Pathol* 1966;22:764-79.
6. Aziz SR. Coming to America. Betel nut and oral submucous fibrosis. *J Am Dent Assoc* 2010;141:423-8.
7. Trivedy C, Warnakulasuriya S, Peters TJ. Areca nuts can have deleterious effects. *Br Med J* 1999;318:1287.
8. Pankaj C. Areca nut or Betel Nut Control is Mandatory if India wants to reduce the burden of Cancer especially Cancer of the Oral Cavity. *Int J Head Neck Surg* 2010;1:17-20.
9. Verma S. Areca nut (betel nut) chewing: A popular Indian cultural practice and its mucosal implications. *Int J Dermatol* 2011;50:229-32.
10. Trivedy CR, Craig G, Warnakulasuriya S. The oral health consequences of chewing areca nut. *Addict Biol* 2002;7:115-25
11. Review of Areca (Betel) Nut and Tobacco Use in the Pacific- A Technical Report. World Health Organization; 2012.
12. Yeh CJ. Fatigue root fracture: a spontaneous root fracture in non-endodontically treated teeth. *Br Dent J* 1997;182:261-6.
13. Norton SA. Betel: Consumption and consequences. *J Am Acad Dermatol* 1998;38:81-8.
14. Greer RO Jr., Poulson TC. Oral tissue alterations associated with the use of smokeless tobacco by teenagers. *Oral Surg Oral Med Oral Pathol* 1983;56:275-84.
15. Christen AG. The clinical effects of tobacco on oral tissue. *JADA* 1970;81(6):1378-82
16. Christen AG. The case against smokeless tobacco: five facts for the health professional to consider. *JADA* 1980; 101(3):464-9.
17. Christen AG, Armstrong WR, McDaniel RK. Intraoral leukoplakia, abrasion, periodontal breakdown, and tooth loss in a snuff dipper. *JADA* 1979;98(4):584-6.
18. Christen AG, Swanson BZ, Glover ED, Henderson AH. Smokeless tobacco: the folklore and social history of snuffing, sneezing, dipping, and chewing. *JADA* 1982;105(5):821-9.
19. Tamse A., Kaffe I., Littner M., Shani R. Statistical evaluation of radiologic survey of pulp stones. *J Endodon.* 1982, 8:455-8.
20. Baghdady V., Ghose L., Nahoom H., Prevalence of pulp stones in a teenage Iraqi group. *J Endodon.* 1988, 14:309-11.
21. Sayegh F., Reed A. Calcification in the dental pulp. *Oral Surg Oral Med Oral Pathol.* 1968, 25:873-82.
22. Hill T. Pathology of the dental pulp. *J. Amer Dent Ass* 1934, 21:820-44.
23. Moss-Salentijn L., Hendricks-Klyvert M. Epithelially induced denticles in the pulps recently erupted, noncarious human premolars. *J Endodon.* 1983, 9:554-60.
24. Sundell J., Stanley H., White C. The relationship of coronal pulp stone formation to experimental operative procedures. *Oral Surg Oral Med Oral Pathol.* 1968, 25:579-89
25. Stenvik A., Mjor I. Epithelial remnants and denticle formation in the human dental pulp. *Acta Odontol Scand* 1970, 28:721-8.

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