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Correlation Of Radiographic Occurence Of Pulp Stones To Age, Gender And Clinical Conditions In Mandibular First Molars - A Retrospective Data Analysis In Chennai Population .

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ABSTRACT:

Introduction:

Pulp stones are discrete calcified masses found in the dental pulp, in the pulp tissue or become attached to or embedded into the dentine. Structurally, pulp stones can be classified as true or false, the former being made of dentine and lined by odontoblasts, whereas false pulp stones are formed from degenerating cells of the pulp that get mineralized. The aim of the study was to determine the correlation of pulp stones to age, gender and clinical conditions of the tooth in mandibular first molars.

Materials and methods:

It is a university based study, data was collected and analysed through SPSS and the results were given in the form of bar graphs.

Results:

From the results of the study, pulp stones are more prevalent in younger age groups of 20-40 years ($p<0.05$) and more prevalent among males ($p<0.05$) than females. The prevalence of pulp stones varies among each population.

Conclusion:

From the study, the prevalence of pulp stone was found to be more in men than women. This may be due to various factors such as bruxism, iatrogenic factors such as trauma, and longstanding irritation to the pulp.

Keywords:

Dental Pulp, Endodontics, Pulp stones, Dental innovation

INTRODUCTION:

Pulp stones are discrete calcified masses found in the dental pulp, in the pulp tissue or become attached to or embedded into the dentine (1). Structurally, pulp stones can be classified as true or false, the former being made of dentine and lined by odontoblasts, whereas false pulp stones are formed from degenerating cells of the pulp that get mineralized (2). The formation of pulp stones is still something of an enigma. Studies show that a high frequency of cell islands, considered to be of epithelial origin, were

observed together with pulp stone formation in teeth that had been subjected to experimental intrusion (3,4).

The exact etiology of the occurrence of pulp stone is not well understood (5). Some of the factors have been reported as a cause of pulp stone such as pulp degenerative, inductive interaction between epithelium and pulp tissue, age, poor circulatory supply, genetic predisposition, idiopathic factors, and also orthodontic tooth movements (6). Histopathologically, the pulp stones are seen as a central amorphous mass of irregular calcification surrounded by concentric lamellar rings of regular calcified material. Occasionally, a peripheral layer of tubular dentin may be applied by odontoblasts, which arise from the surrounding pulp tissue (7). The pulp stones are identified radiographically as a radiopaque mass (8). Various forms of radiographic methods can be used to identify pulp stones such as intraoral periapical radiograph and bitewing radiograph.

Pulp stones are found accidentally on bitewing or periapical radiographs (9) but can be seen in panoramic radiographs (10) also, they vary in size, form and number (11). Pulp stones are seen on radiographs as contrasting oval, round or irregularly shaped bodies in the coronary pulp chamber and root canals. According to the location, pulp stones are classified as free, attached to the dentin or embedded into the dentin. The aim of the study is to determine the correlation of pulp stones to age, gender and clinical conditions of the tooth in mandibular first molars. (12)

MATERIALS AND METHODS:

Study setting:

A university set up was selected for this study which provided easy accessibility to the data and the population was of similar ethnicity for this study. Before scheduling the study official permission and approval was obtained from the university (ethical approval number - SDC/SIHEC/2020/DIASDATA/0619-0320).

Data collection :

The radiographic report of the patients with non pulp stones were taken into study. Data was retrieved from the dental case records of Saveetha Dental College, chennai.

Inclusion and exclusion criteria:

The data of radiographic occurrence of pulp stones among all the age groups of were included for this study; case records with incomplete data were excluded and inclusion criteria were age, gender, tooth number and clinical condition of the tooth.

Statistical analysis:

These data were tabulated in the Microsoft excel sheets and were imported to the SPSS (Version 20.0) software. After entering the data in SPSS software the variables were verified and association was done between different age groups, gender, tooth number and clinical condition. Data was analysed using Chi-square test.

RESULTS AND DISCUSSION:

In this study, the age group of 20-40 years were 55%, 40-60 years were 20.5% and 60-80 years were 24.2%. From the data collected 54.4% of them were male patients and 45.45% of them were female patients. About 50% were mandibular left first molar and 50% were mandibular right first molar. On analysis of clinical condition, 27% of the tooth have proximal caries, 24% are healthy teeth, 24.2% of the tooth have class 1 caries, 5% have class 2 caries and 19% have attrition. Among the age group of 20-40 years about 115 of 676 teeth have proximal caries, among 40-60 years of age group 40 of 676 teeth are healthy.

In our study, the occurrence of pulp stone is more prevalent among 20-40 years of age group. Similarly, in another study the majority of patients (272) 55.06% were between age from 18 to 27 (13) . In contrast to this study, another study reported that the 30-50 years age group had significantly higher prevalence of pulp stones in comparison to younger age groups (14).

In our study, the pulp stones are more prevalent among males (54%) than females(45.5%). In contrast to this study, a study shows a significantly higher prevalence of pulp stones in women (15). It could be due to women being more sensitive to higher stress levels and, consequently, the higher prevalence of bruxism. Another study shows contrast results, the prevalence of pulp stone in women was 9% (35 subjects) and 5% in men (19 subjects) (16).

In this study, pulp stones are more prevalent among decayed teeth than healthy teeth, showing 27% of the teeth with pulp stones are proximally decayed teeth. In a study shows more pulp stones appear in decayed teeth than in sound ones and this has been confirmed by previous research, more pulp stones were found in molars with caries or with fillings in the crown compared to intact ones.

The etiological factors for the formation of pulpal calcifications are not well understood. Age, gender, systemic disease, and long term irritation such as deep caries and restorations have been proposed as possible implicated factors in the development of pulpal calcifications (17)(18). The pathological effect of irritation by the microorganisms of dental caries on the pulpal tissue can cause a vascular wall injury, resulting in the deposition of calcium salts within the tissue. Although the currently held clinical view is that pulp stones have no clinical significance, they lead to complications when endodontic therapy is needed; this may lead to hindering canal location and negotiation.

Authors also reported a correlation between pulpal calcification and cardiovascular disease and those subjects with a history of cardiovascular disease were found to have an increased incidence of pulp stones in asymptomatic vital pulps, compared to subjects with no history of cardiovascular disease. This shows that pulp stones found incidentally in the pulp tissue play an important role in the diagnosis of a serious underlying disease or condition. In addition, in forensic dentistry, the radiographic matching of pulp stone configurations, along with other features recorded in dental records, may provide valuable information in the identification of deceased persons.

In addition, based on the patient's dental data including radiographs it is probable that the presence of pulp stones in pulp tissue may be associated with heart attack related death. Limitations of this study

could be short sample size with restricted geography. Therefore, further research related to pulp stones may contribute additional information to the field of forensic medicine.
Our team has extensive knowledge and research experience that has translate into high quality publications(19–28),(29–32),(33–37) (38)

CONCLUSION:

Within the limitations of the present study it was shown that more than half of the participants of age group 20-40 years had pulp stones in mandibular first molars. Higher prevalence of pulp stones was associated with younger age and decayed/ filled teeth. From the study, the prevalence of pulp stone was found to be more in men than women in the south Indian population. This may be due to various factors such as bruxism, iatrogenic factors such as trauma, and longstanding irritation to the pulp. This may be identified by further studies on etiological factors that may cause pulp stone formation.

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CONFLICT OF INTEREST:

All the authors declare that there was no conflict of interest in present study.

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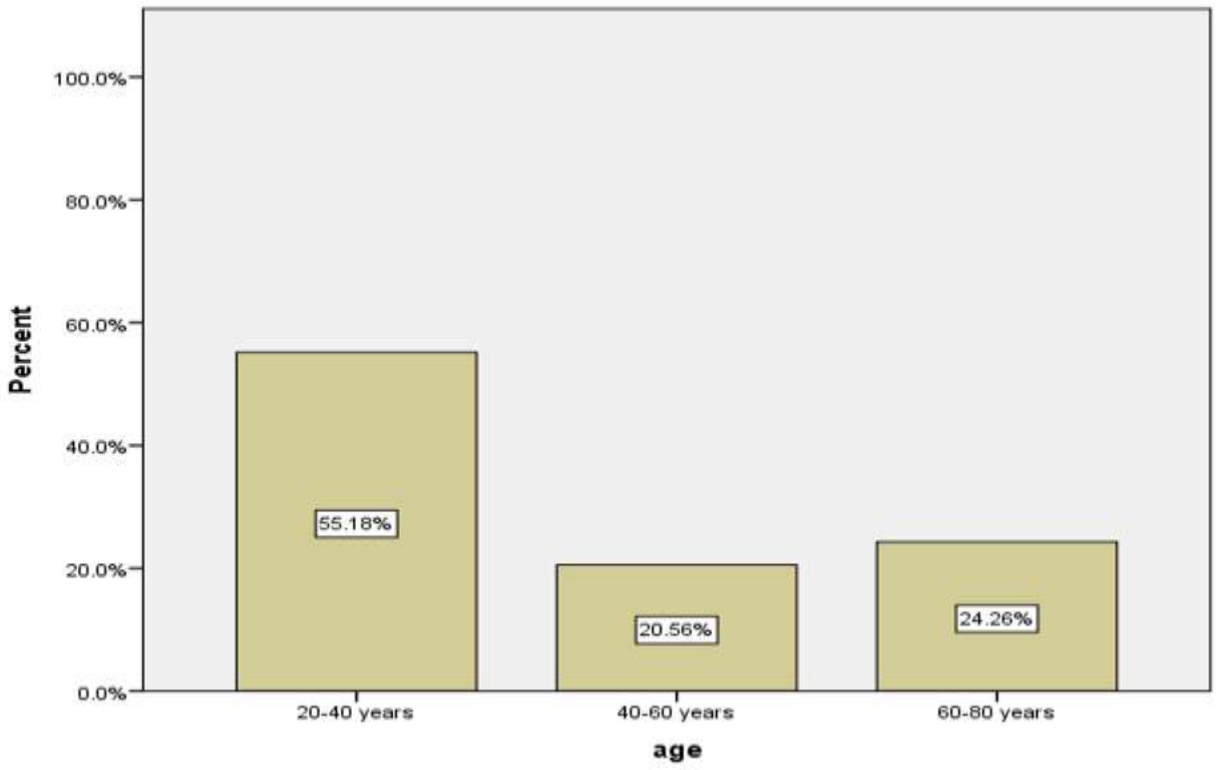

Figure 1: The bar graph depicts the percentage of age group of the patients with pulp stones. The age group of 20-49 years were about 55% and 40-60 years were 21% and 60-80 years were 24%.

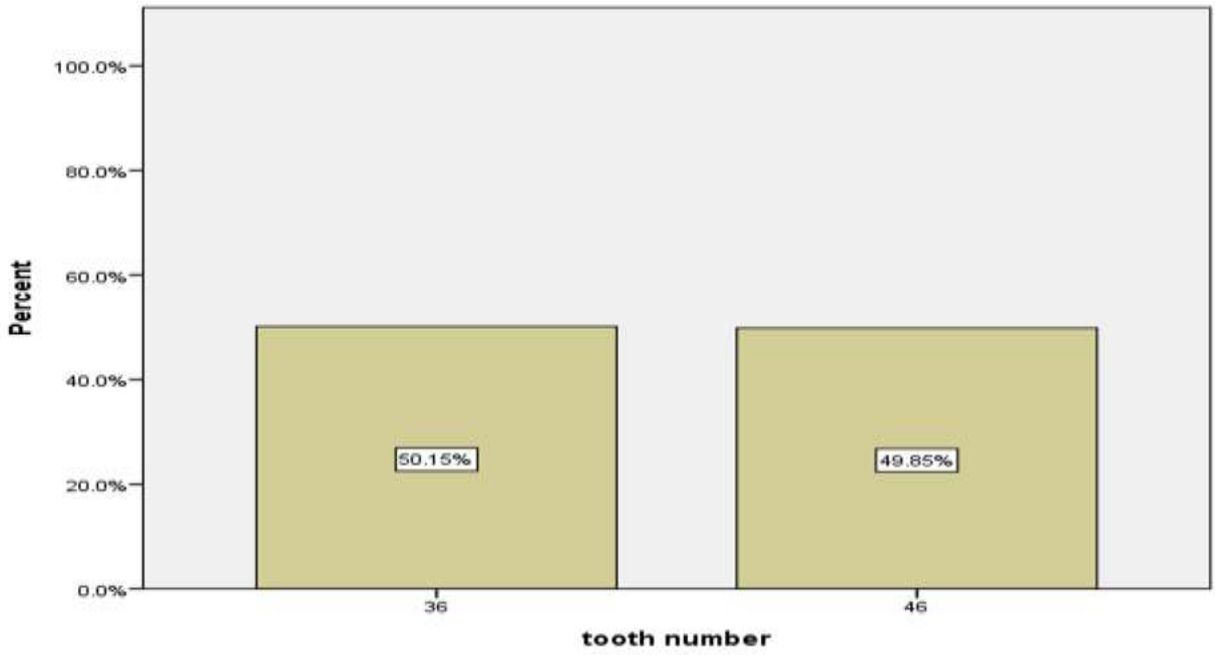

Figure 2: The bar graph depicts the percentage of tooth number of the patients with pulp stones. Most commonly reported teeth were left mandibular first molar (50.1%), and right mandibular first molar (49.8%).

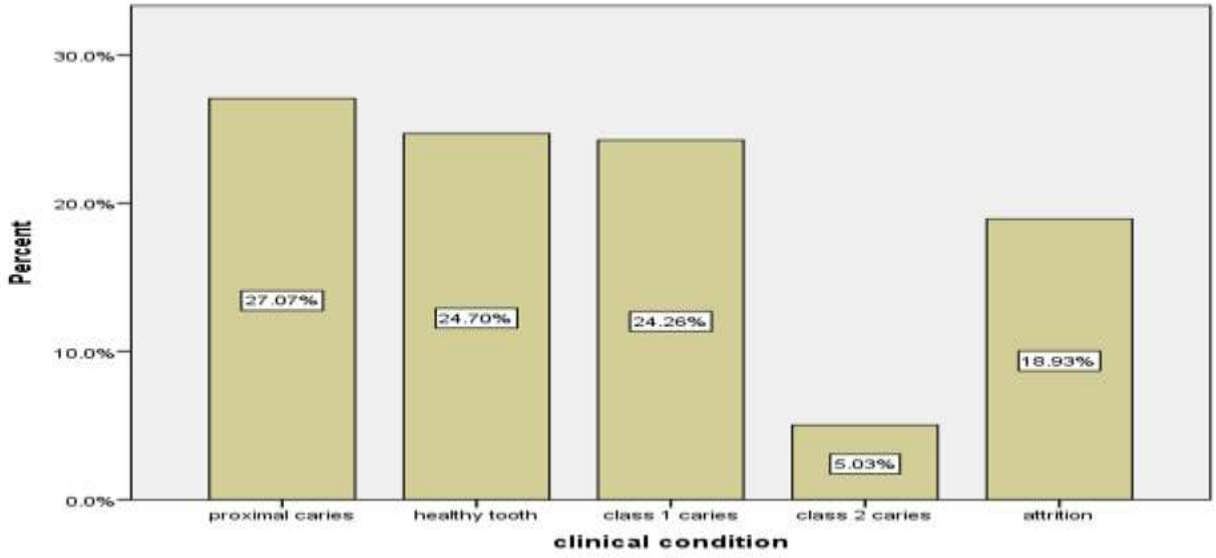

Figure 3: The bar graph depicts the percentage of clinical condition of the teeth with pulp stones. Pulp stones are more prevalent in teeth with proximal caries(27%), healthy teeth (24.7%).

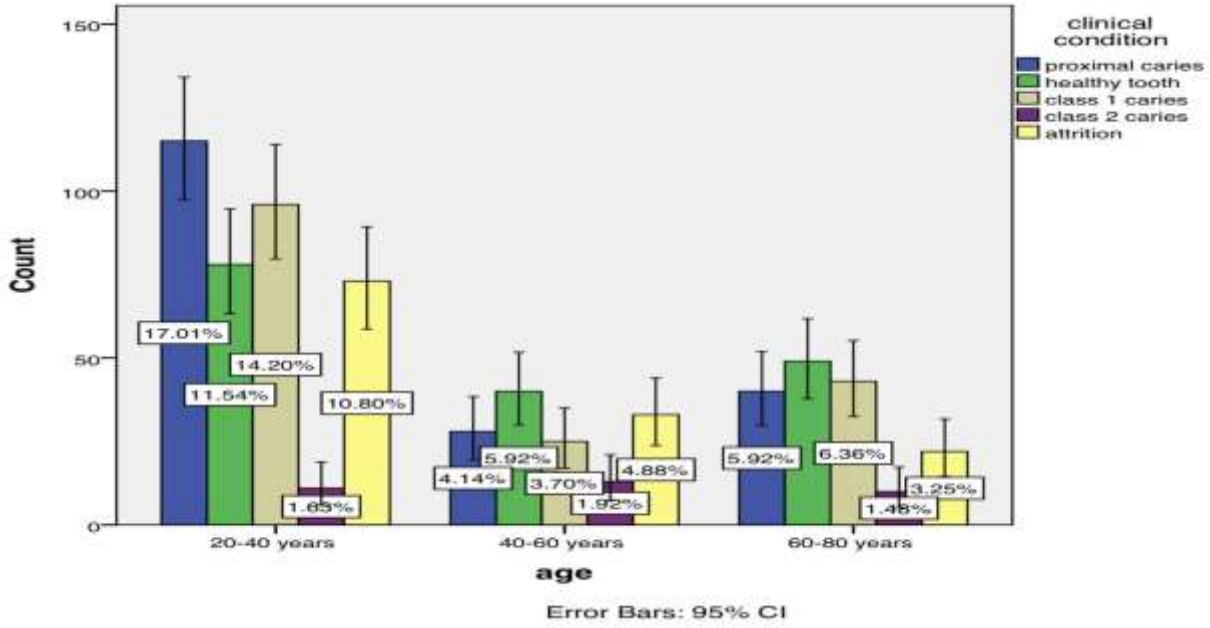

Figure 4: The bar graph depicts the correlation between age and clinical condition of the teeth with pulp stones. X axis denotes the age of the patients who have pulp stones and Y axis denotes the count of the patients.

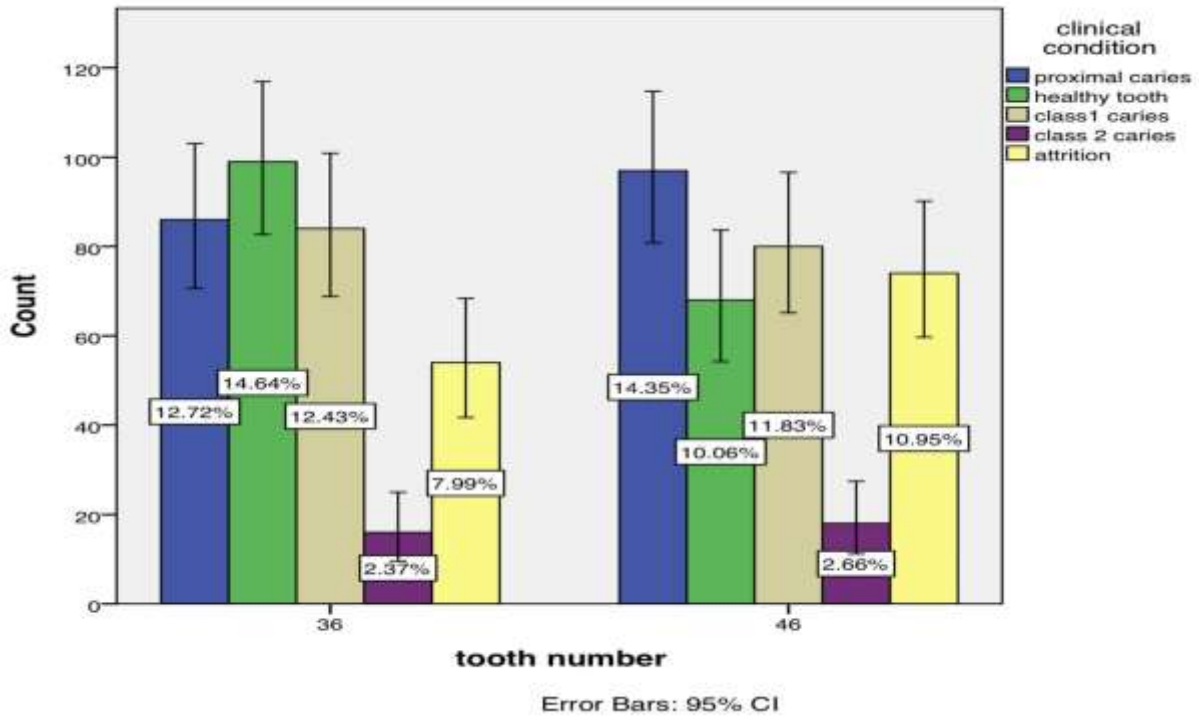

Figure 5: The bar graph depicts the correlation between age and clinical condition of the teeth with pulp stones. X axis denotes the tooth number of the patients who have pulp stones and Y axis denotes the count of the patients.

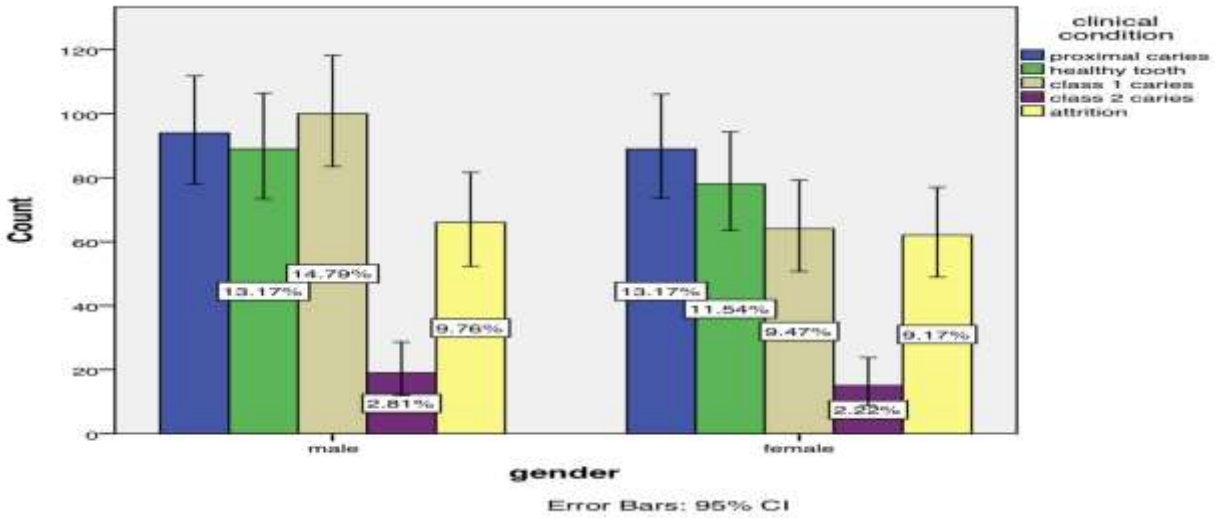

Figure 6: The bar graph depicts the correlation between gender and clinical condition of the teeth with pulp stones. X axis denotes the gender of the patients who have pulp stones and Y axis denotes the count of the patients.