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Original Research

Assessment of prevalence of idiopathic pulp calcifications in permanent teeth using digital orthopantomographs

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ABSTRACT:

Background: Pulp calcifications are discrete or diffuse calcified structures present in any portion of the pulp tissue, although certain types are more common in the pulp chamber and others in the root canal. The present study was conducted to assess the prevalence of idiopathic pulp calcifications in permanent teeth by using digital orthopantomographs (OPG). **Materials & Methods:** 180 OPG of both genders were obtained. Definite radiopaque bodies were observed inside the pulp chambers and root canals of all the teeth were identified as pulp calcifications and were assessed. The number of calcifications, tooth type, and side of the dental arches were also recorded. **Results:** Out of 180 patients, there were 75 males and 105 females. 28 males and 40 females exhibited pulp stones. The difference was significant (P< 0.05). Maxillary first molar had 18, second molar had 7, first premolar had 4 and second premolar had 3 pulp stones. Mandibular first molar had 20, second molar had 5, first premolar had 6 and second premolar had 5 pulp stones. The difference was significant (P< 0.05). **Conclusion:** Females had higher pulp stones. Mandibular first and maxillary first molar had maximum pulp stones.

Key words: Pulp stones, Mandibular first molar, panoramic radiograph

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INTRODUCTION

Pulp calcifications are discrete or diffuse calcified structures present in any portion of the pulp tissue, although certain types are more common in the pulp chamber and others in the root canal.[1] These calcifications under the term of 'dental pulp nodules' have been first mentioned by Norman and Johnston in 1921. This term has in time been replaced by the term 'denticles'. In recent literature, the term 'dental nodules' has appeared. Kronfield has classified pulp calcifications into discrete (denticles and pulp nodules) and diffuse types based on the morphology.[2] They may be round or oval, and some pulp stones inhabit most of the pulp chamber. Some may be large as 2 or 3 mm in diameter.[3] Only these large calcified concretions are radiographically discernible. Pulp stones occur most commonly in molars, although they occur in all tooth types. Healthy, deceased, and even unerupted teeth can have pulp stones.[4] Half the teeth of young people and in almost all the teeth of people older than fifty years of age have pulp stones which are probably apparent microscopically.[5] Pulp degeneration, inductive interactions between epithelium and pulp tissue, age, circulatory disturbances in the pulp, nanobacteria, orthodontic tooth movements, idiopathic factors, genetic predisposition, fluoride supplementation, and Marfan syndrome are the few factors which are implicated in pulp stones formation. Their formation may be associated with long standing irritants such as caries, deep fillings, and chronic inflammation. Some authors suggest that pulp stones are a feature of an irritated pulp, attempting to repair itself.[6,7] The present study was conducted to assess the prevalence of idiopathic pulp calcifications in permanent teeth by using digital orthopantomographs (OPG).

MATERIALS & METHODS

The present study comprised of 180 OPG of both genders. The study was approved from institutional ethical committee.

Data such as name, age, gender etc. was recorded. Panoramic radiographs (OPG) were taken by using the Planmica machine. Only images of good quality,

which had the clearest reproduction of teeth, without any superimposition were included. All healthy erupted teeth were examined. Definite radiopaque bodies were observed inside the pulp chambers and root canals of all the teeth were identified as pulp calcifications and were assessed. The number of calcifications, tooth type, and side of the dental arches were also recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 180		
Gender	**Males**	**Females**
Number	75	105

Table I shows that out of 180 patients, there were 75 males and 105 females.

Table II Prevalence of pulp stones

Total	Pulp stones	P value
Males	28	0.02
Females	40	

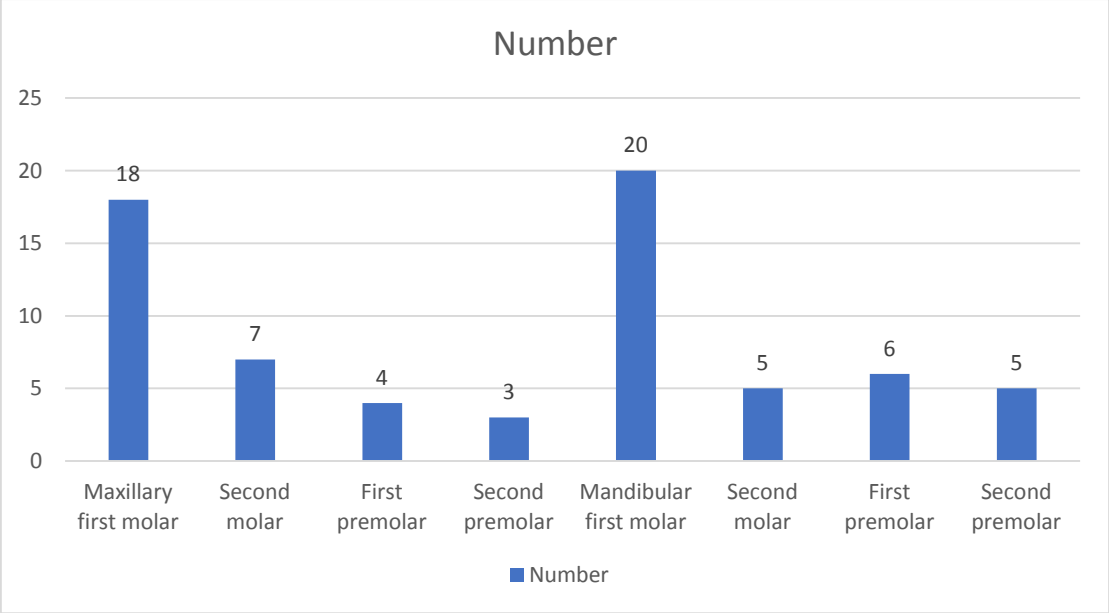
Table II shows that 28 males and 40 females exhibited pulp stones. The difference was significant (P< 0.05).

Table III Distribution of pulp stones according to the dental arches and tooth types

Tooth type	Number	P value
Maxillary first molar	18	0.01
Second molar	7	
First premolar	4	
Second premolar	3	
Mandibular first molar	20	
Second molar	5	
First premolar	6	
Second premolar	5	

Table III, graph I shows that maxillary first molar had 18, second molar had 7, first premolar had 4 and second premolar had 3 pulp stones. Mandibular first molar had 20, second molar had 5, first premolar had 6 and second premolar had 5 pulp stones. The difference was significant (P< 0.05).

Graph I Distribution of pulp stones according to the dental arches and tooth types



DISCUSSION

Various prevalence studies have been carried out in literature and the reported prevalence rate ranges from 8 to 90%. This depends upon the study type, design, and radiographic technique used.[8] Many prevalence studies have identified pulp calcifications using radiography. According to Bahetwar et al[9], true prevalence is likely to be higher, because pulp

calcifications with a diameter smaller than 200 μm cannot be seen on radiographs, and therefore, 15% of the pulp calcifications go undetected or unappreciated. Some researchers have reported the prevalence based on the number of patients, whereas, others represented only the rates based on teeth numbers. The present study was conducted to assess the prevalence of idiopathic pulp calcifications in permanent teeth by using digital orthopantomographs (OPG).

In present study, out of 180 patients, there were 75 males and 105 females. Sreelakhmi et al[10] assessed the prevalence of idiopathic pulp calcifications in permanent teeth by using digital orthopantomographs (OPG), and to report any association between the occurrence of pulp calcifications with gender, tooth type, dental arches, and the side of the dental arch. A total of 150 digital panoramic radiographs of an equal number of male and female patients fulfilling the inclusion criteria were examined. The sample was composed of 150 patients within the age group of 15-50 years. Four thousand three hundred and ninety-nine teeth were evaluated and the pulp calcifications were assessed. The frequency of occurrence of pulp calcifications between gender, tooth type, dental arches, and the side of the dental arch were compared. Results: From 150 orthopantomographs (OPGs), a total of 4399 teeth were examined, and the total number of patients with pulp calcifications were 80 (41 females and 39 males). The overall distribution was more in females, in the maxillary arches, and in the first molars. Patients with bilateral pulp calcifications were more than those with unilateral pulp calcifications

We found that 28 males and 40 females exhibited pulp stones. The difference was significant ($P< 0.05$). Pulp stones have been noted in patients with systemic or genetic diseases, such as, diabetics, hypertension, dentin dysplasia, dentinogenesis imperfecta, osteogenesis imperfecta, and in certain syndromes such as the Van der woude syndrome, Elfin-facies syndrome, and Ehlers Danlos syndrome. Baghdady[11] confirmed the presence of increased pulpal calcifications in subjects with coronary atherosclerosis upon radiographic examination. Edds et al[12] suggested that 74% of the patients with reported cardiovascular disease had detectable pulp stone, while only 39% of the patients without a history of cardiovascular disease had pulp stones.

We observed that maxillary first molar had 18, second molar had 7, first premolar had 4 and second premolar had 3 pulp stones. Mandibular first molar had 20, second molar had 5, first premolar had 6 and second premolar had 5 pulp stones. Tarim et al[13] in their study, pulp chamber opacities were detected in 199 (19.3%) out of the 1031 examined teeth, and in 84 (72.4%) out of the 116 kidney stone patients. There was no statistically significant difference between the study and control group. The occurrence of pulp stones was significantly higher in molars than premolars and similar prevalence was found between dental arches and sides.

CONCLUSION

Authors found that females had higher pulp stones. Mandibular first and maxillary first molar had maximum pulp stones.

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