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Original Article

Pulp Stones in Patients Undergoing Orthodontic Treatment

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ABSTRACT:

Background: Pulp stones are foci of calcification in the dental pulp.Pulp degeneration, inductive interactions between epithelium and pulp tissue, age, circulatory disturbances in the pulp, nanobacteria, orthodontic tooth movements etc. might lead to formation of pulp stones. Under the light of above mentioned data, the present study was planned to assess the prevalence of pulp stones in patients undergoing orthodontic treatment. **Materials & method:** The present study was conducted to assess the prevalence of pulp stones in patients undergoing orthodontic treatment. A total of 100 patients undergoing orthodontic treatment were included in the present study. Panoramic radiographs were obtained from all the patients as a part of the diagnostic data collected for inclusive orthodontic treatment. At the end of the orthodontic treatment, in the immediate phase, panoramic radiographs were taken. All the radiographs were examined by two different experienced oral radiologists, for assessing the presence or absence of pulp stones. All the results were analyzed by SPSS software. **Results:** A total of 100 patients were analyzed in the present study. Out of 100, 60 patients were males while the remaining 40 patients were females. A non-signifcant increase was observed in the prevalnce of pulp stones in patients post-treatment. **Conclusion:** Orthodontic treatment might lead to increased formation of pulp stones.

Keu words: Orthodontic treatment, Pulp stones, Treatment

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INTRODUCTION

Pulp stones are foci of calcification in the dental pulp. Their cause is unknown, and no firm evidence exists that they are associated with any systemic or pulpal disturbance. Pulp stones are radiologically variable; they may occur as a single dense mass or as several small radiopacities seen within pulp chambers or root canals, or may extend from the pulp chamber into root canals.[1- 3]

Depending on their microscopic structures, pulp stones have been classified into true or false forms. They are not clinically apparent but are common radiographic findings. 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.[4- 6]

Under the light of above mentioned data, we planned the present study to assess the prevalence of pulp stones in patients undergoing orthodontic treatment.

MATERIALS & METHOD

The present study was planned to assess the prevalence of pulp stones in patients undergoing orthodontic treatment. Ethical approval was obtained from institutional ethical committee and written consent was obtained from patients after explaining in detail the entire research protocol. A total of 100 patients undergoing orthodontic treatment were included in the present study. Inclusion criteria for the present study included:

- Patients undergoing non-extraction orthodontic treatment,
- Patients in which complete data records were available,
- Patients with negative history of any systemic illness,

Patients with endodontically restored, carious or non-vital premolars were excluded from the present study. Panoramic radiographs of all patients were obtained as a part of the diagnostic data collected for inclusive orthodontic treatment. At the end of the orthodontic treatment, in the immediate phase, panoramic radiographs were taken. Only those patients were included in the present study in which orthodontic treatment was carried

out for a minimum of one and a half year. We evaluated maxillary and mandibular first and second premolars from pre-treatment and post-treatment panoramic radiographs. All the radiographs were examined by two different experienced oral radiologists, for assessing the presence or absence of pulp stones. All the results were analyzed by SPSS software. Univariate regression curve was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

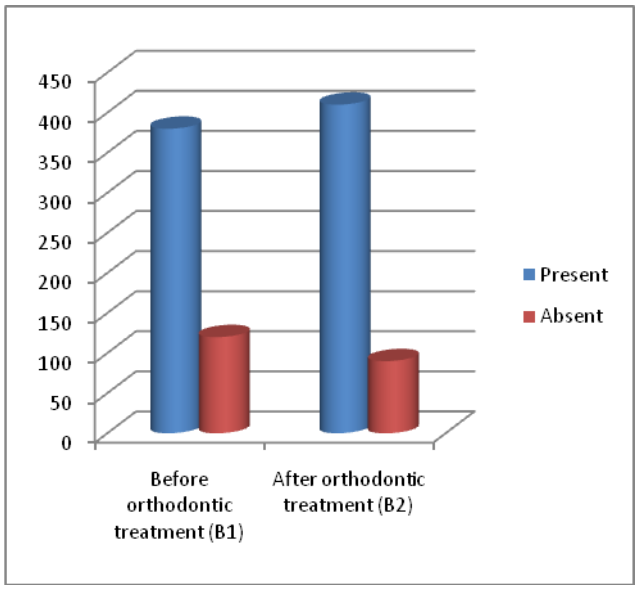
RESULTS

A total of 100 patients were analyzed in the present study. Out of 100, 60 patients were males while the remaining 40 patients were females. Before the starting of the orthodontic treatment, pulp stones were present in 380 teeth while they were absent in 120 teeth. After the finishing of the orthodontic treatment, pulp stones were found to be present in 410 teeth while they were absent in 90 teeth. No signifcant difference was observed while comparing the prevalance of pulp stones in patients who underwent orthodontic treatment (P- value < 0.05). Also, there was no signifcant difference while comparing the prevalance of pulp stones in between males and females.

Table 1: Comparison of pulp stone formation

Pulp stones	Before orthodontic treatment (B1)	After orthodontic treatment (B2)	P-value
Present	380	410	0.52
Absent	120	90	
Total teeth	500	500	

Graph 1: Prevalence of pulp stones



DISCUSSION

In the present study, a non-signifcant increase was observed in the prevalnce of pulp stones in patients post-treatment. Turkal M et al determined the prevalence and distribution of pulp stones in posterior tooth group by using panoramic radiograph. Panoramic radiographs from 6912 patients were reviewed for the presence of pulp stones. The overall incidence of pulp stones in the patients and their correlations between female and male patients and between the right-side and left-side occurrences were analyzed by computer program, SPSS. Pulp stones were detected in 879 out of 6912 patients (person prevalence 12.7%). Pulp stones were detected in 2009 teeth out of a total of 96240 teeth to give a tooth prevalence of 2.1%. Attention should be paid to the presence of pulp stones and the treatment problems associated with them.[7] Ravanshad S et al assessed the prevalence of pulp stones in a sample of Iranian population and to report its occurrence regarding gender, dental arch, tooth type and dental status. Dental records of patients who attended Shiraz Dental School were selected randomly. Teeth were classified in the case of presence or absence of pulp stones, and the prevalence was analyzed in different gender, tooth types, dental arch, and dental status (intact, carious, or restored) groups. Of the 652 examined subjects, 306 (46.9%) had one or more teeth with pulp stones. Of the 8244 posterior teeth examined, 928 (11.25%) had pulp stones in the pulp chamber. These pulp stones were detected in 76 (37.6%) of males and 230 (51%) of females. The frequency of pulp stones among different teeth between maxillary and mandibular arches had almost a similar pattern. The occurrence of pulp stones noted in this study was significantly higher in female, molar teeth than premolar and 1st maxillary molar than mandibular.[8]

Ertas ET et al assessed the incidence of dental pulp stone formation during orthodontic treatment. A sample of 545 patients who had undergone non extraction orthodontic treatment were included in this study. 8442 teeth (T1) and 8410 teeth (T2), including the first and second maxillary and mandibular premolars and molars were evaluated from the pre- (T1) and post-treatment (T2) panoramic radiographs of the patients. The Pearson Chi-square test was used to investigate the associations between the presence of dental pulp stone, gender, age, tooth type and arches. Dental pulp stones were detected in 3% of the teeth at pretreatment panoramic radiographs and 5.2% of the teeth at posttreatment panoramic radiographs. Pulp stone prevalence increased pointedly (2.2%) in the pre- and post-treatment radiographs. Orthodontic treatment may trigger the formation of dental pulp stones.[9] Nayak M et al determined the correlation between pulp stones and cardiovascular disorders, Type II diabetes mellitus, autoimmune disorders and dental wear defects. A total of 1432 teeth of five groups were examined, comprising of patients with C.V.S. disorders; Type II diabetes mellitus, autoimmune disorders, dental wear defects and control group. Teeth were examined under 2X magnification on radiovisiograph (RVG) and conventional intra-oral periapical radiograph. The presence or absence of pulp stones were recorded. Pulp stones were found in 134 (9.35%) of 1432 teeth detected. Significantly, higher numbers of pulp stones were recorded in patients with cardiovascular disorder (15.86%) than other groups. The occurrence of pulp stones were significantly higher in molars (18.29%) than premolars (6.6%) and in maxillary

arch (12.36%) than in mandibular arch (5.95%). No significant difference was found between sexes and sides. Positive correlation was found between systemic disorder and pulp stones.[10] Kannan S et al determined the prevalence of pulp stones in the Malaysian population using radiographs, and to assess the association of pulp stones with gender, age, tooth type, dental arch and tooth status. Occurrence of pulp stones among the three races in Malaysia (Malay, Chinese and Indians) was also studied. A retrospective study was performed from a random sample of 361 dental records. Data were collected from patient files and 507 intraoral periapical radiographs. All radiographs were examined by an oral radiologist to identify pulp stones and associated factors. Of the 361 patients, 205 were females and 156 were males. Pulp stones were identified in 162 (44.9%) subjects in 1 or more teeth and in 280 (15.7%) teeth of the total 1779 teeth examined. Pulp stones were found significantly more in molars and teeth that were not intact. There was no significant correlation with sex, increasing age, dental arches, and ethnic races. The prevalence of pulp stones in the Malaysian population studied was 44.9%. Pulp stones were more often seen in teeth that were restored or affected with caries.[11]

CONCLUSION

From the above results, the authors concluded that orthodontic treatment might lead to increase in formation of pulp stones. However; future studies are directed.

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