PULP STONE: CASE STUDY

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ABSTRACT
The study was designed to determine pulp stone from prepared ground section using BX 51 pentahead. The study was performed in 200 subjects between 20-70 years of age. This study was aimed at determining the frequency of pulp stones. The microscopically examined tooth showed pulp stone are extremely common, occurring in many as 90% of the people between the age of 50 to 70. Pulp stone seems to increase with age. True pulp stone are rare.

KEYWORDS: Pulp stone, pulp chamber, Ground section.

INTRODUCTION
Pulp stone or denticles are nodular, calcified masses appearing in either or both in coronal and root portion of the pulp (figure1). They are hard, bone like structure. They are usually detected on x ray examination or under a microscope after the tooth was extracted. They may exist as solitary or multiple bony formation within the pulp tissue or may be attached to the wall of pulp chamber.(Figure2) Being a degenerative disorder, pulp stone is more prevalent in old age. Occasionally they are seen in younger age. Dental caries, operative procedures, periodontal diseases, orthodontic tooth movement including genetic predisposition and idiopathic factors are the proposed etiologies of its occurrence in the early age.

Age changes and pulpal calcifications
With age the pulp spaces of teeth decrease in size through the deposition of secondary and tertiary dentine. When tooth wear, caries or operative intervention is a feature this process becomes more evident. In most pulps, dystrophic calcification is found to be of a variable degree, and even in teeth without caries or restorations scattered calcification occurs, unrelated to disease. A study of teeth obtained from individuals ranging from 50 to 70years found not only a decrease in the size of the pulp chamber due to deposition of secondary dentine with increasing age, but also a progressive deposition of calcified masses that originated in the root pulp.[1] This confirmed the earlier work that registered calcification in 90% of teeth from people more than 40 years, mainly involving apically located blood vessels.[2] At no age were thick collagen fibres seen independent of the connective tissue sheaths. Furthermore, the collagen bundles of vascular and neural sheaths of old pulps were the loci for calcification. As a result of calcification of the blood vessels and nerves in the pulp, their numbers decrease. The persistence of the connective tissue sheaths of nerves and blood vessels gives the pulp a histologically fibrotic appearance. As part of the pulp ageing process there is also a considerable decrease in the number of cells (fibroblasts, odontoblasts and mesenchymal cells), with the cell density decreasing by half from 20 to 70 years.[3] At the same time, fibrous tissue accumulation occurs to the point where almost nothing exists except the fibrous tissue. This is termed fibrous degeneration or pulp atrophy. It is different from fibrous replacement (such as the replacement of infarcted heart muscle tissue) where the fibrous connective tissue contains viable fibroblasts². Some authors also believe that fat deposits occur in the pulp with age, and that calcification commonly occurs within these deposits[3], but this may be a tissue-processing artefact.[6]

MATERIAL AND METHOD
- 4000 patients (EXTRACTED TOOTH) in the age range of 20-70 years who were observed. Subjects having full complement of non - carious posterior teeth and healthy periodontium or with minimal caries and / or restoration were included under the study. Restorations, if any were limited to enamel or shallow dentin. Subjects with class V restorations or those who have undergone previous radiographic survey and subjects with history of traumatic injuries to teeth, systemic diseases, tooth extraction due to pulpo-periapical lesions were excluded from the study.
- The armentarium used in the study are Carborundum stone (rough and smooth), Alcohol and Xylene, Formalin, Microscope and slides, cover slip, DPX.
- A thin section of the tooth was prepared.
- Section was mounted using DPX as mounting agent.

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Microscopic examination of the prepared section was done.

RESULT

- The microscopically examined tooth showed pulp stone are extremely common with advancing age.

<table>
<thead>
<tr>
<th>Age</th>
<th>Total number of individuals</th>
<th>percent of pulp stone</th>
<th>Number of Individual with pulpstone</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-50</td>
<td>150 - 177</td>
<td>20-25%</td>
<td>30-50</td>
</tr>
<tr>
<td>50-70</td>
<td>122 - 150</td>
<td>75-80%</td>
<td>167-200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Number of Individuals With true pulp stone</th>
<th>Percentage of True pulp stone</th>
<th>Total Number of Individuals With</th>
<th>Percentage of False pulp stone</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-50</td>
<td>90-125</td>
<td>20-25%</td>
<td>100-125</td>
<td>20-25%</td>
</tr>
<tr>
<td>50-70</td>
<td>100-125</td>
<td>20-25%</td>
<td>500-625</td>
<td>20-25%</td>
</tr>
</tbody>
</table>

CLINICAL IMPLICATIONS
Pulp stones have been described as symptoms of changes in the pulp tissue, rather than their cause. The clinical relevance of pulp stones in terms of their effect upon root canal treatment. Their large size in the pulp chamber may block access to canal orifices and alter the internal anatomy. Attached stones may deflect or engage the tip of exploring instruments, preventing their easy passage down the canal.\(^7\) Sometimes large pulp stone can be dissected out of an access cavity using burs, but ultrasonic instrumentation with the use of special tips makes their removal far easier.\(^8\)

CONCLUSION
The study group included 4000 patients (extracted tooth) between the age of 20 and 70 years. Even though the etiology of pulp stones is not well understood, it is considered by many authors as a degenerative disorder since the probability increases as the age advances. Degenerative changes are less likely in the second decade of life (figure 3). Patients with large carious lesions or restorations and periodontal diseases were excluded because these factors can normally induce pulp stones. Patients with class V restorations are also excluded from the study. Patients with missing posterior teeth were excluded from the study.

REFERENCES