

# Prevalence of External Root Resorption Detected in Periapical Radiographs Seen in Patient Visit a Private Dental Colleges

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## ABSTRACT

### BACKGROUND

Root resorption is a common condition associated with periapical pathologies which is detected by intraoral periapical radiographs. Although it's common, its distribution in different periapical pathologies has not been assessed thus far.

### AIM

The aim of the study was to describe a prevalence of external root resorption detected in periapical radiographs seen in patients who visited to a private dental college.

### MATERIALS AND METHODS

All the cases with periapical radiographs were considered in this study. From the periapical radiographs- assessment of external root resorption were done. The data collected are from June 2020 to February 2021. The Data were retrieved from. Dental information archiving system, Saveetha dental college and hospital. Prevalence of external root resorption detected in periapical radiographs were recorded in excel and was subjected to statistical analysis

### RESULTS

From the statistical analysis, it is observed that external root resorption most commonly seen among 36 - 55 years of age about 51 %, followed by 18 - 35 years of age (38 %) has an external root resorption. Females are more prone to have an external root resolution (60 %). Sextant 6 was reported to have a more external root resorption than the other site (26 %).

### CONCLUSION

External root resorption predominantly associated with females. Sextant 6 was more prone to have external resorption. There was a significant difference between age and resorption.

### KEYWORDS

Abscess, Periodontitis, Root resorption

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## INTRODUCTION

Root resorption is a common phenomenon noticed in periapical pathologies arising mainly due to inflammation of pulp and periapical tissues. The persistent encounter between microorganism and host defenses at the periapical area results in local inflammation thereby releasing chemical mediators namely cytokines IL - 1a, IL - 1b, prostaglandins and lipopolysaccharides, thus initiating the pathogenesis of periapical lesions.<sup>1</sup> chemical mediators stimulate root resorption in the same way how they stimulate bone resorption.<sup>2</sup> The resorbed area at the root apex provide the suitable environment for numerous microorganism, which can lead to delayed healing of periapical pathologies and in some cases causes failure of endodontic treatment.<sup>3,4</sup> Moreover resorbed root surfaces are usually not inside the range of root canal instrumentation, which causes troublesome in getting a perfect apical seal.<sup>1,5</sup> Although radiographic examination is an important resource in clinical diagnosis, it's rarely helpful in the diagnosis of external root resorption associated with teeth having apical periodontitis. Intraoral periapical radiographs provide accurate information required for treatment and diagnosis of periodical lesions.<sup>6</sup> recently, cone beam computed tomography proved to be more accurate than periapical radiographs. However, due to its high radiation exposure its use becomes impractical for routine endodontic purpose.<sup>7</sup> The resorptive sites on the root apical apex have great clinical significance in prognosis and success of endodontic treatment.<sup>8,9</sup> The errors in treatment planning and diagnosis of resorptive roots may lead to failure of endodontic treatment.<sup>10</sup> Although apical root resorption is a common phenomenon observed in periapical pathologies, its prevalence among different periapical pathologies has not been assessed so far.<sup>11</sup> The common inflammatory periapical lesions are acute apical periodontitis, periapical cysts, periapical granuloma and periapical abscess.<sup>12</sup> Intraoral periapical radiographs is considered as the preferred diagnostic tool for evaluation, diagnosis and treatment planning of periapical pathologies.<sup>13,14</sup> No other previous radiographic studies are available to discuss the prevalence of Apical root resorption in periapical pathologies. Our team has extensive knowledge and research experience that has translate into high quality publications.<sup>15</sup> The aim of the study is to determine prevalence of external root resorption detected in periapical radiographs seen in patient visits to private dental colleges and hospitals.<sup>18</sup>

## MATERIALS AND METHODS

This research study was defined as a descriptive study where the entire patient's data that reported to saveetha dental college and hospitals, SIMATS, Chennai, India and were diagnosed with external root resorption were obtained from the Dental Information Archiving Software (DIAS). This study setting was a university setting and the research study was conducted in the dental clinics of saveetha dental college. The data are collected from June 2020 to February 2021. All the case sheets were approved and verified by an external reviewer. Further cross verification of data was done with photographs to avoid any errors. During the data collection, all case sheets were retrieved and cross verified with photographs. Radiographs like Intraoral periapical radiographs, Orthopantomagram are included in this study. Approval of the ethical committee was taken before the start of the study. The data was then arranged in a methodical manner using Microsoft Excel software and was tabulated on the basis of 4 parameters namely, age of the subjects, gender of subject, external root resorption, location of the

external root resorption. The data was validated by an additional reviewer. Any incomplete or censored data that was present in the collected data was excluded from the study. Statistical analysis of the compiled data was performed using IBM SPSS statistical analysers (23.0) *Chi square* test was done for statistical analysis.<sup>19-21</sup>

## RESULTS

Out of the total number of external root resorption. External root resorption is most commonly seen among age groups of 6 - 55 years of age (51 %), followers by 18 - 35 years of age (38 %) and more than 55 years of age (10 %). Female (60 %) are more prone to have an external root resorption compared to male (40 %), Sextant 6 (26 %) is the most common to have an external root resorption compared to other sites. 62 % of resorption seems to be a moderate resorption (62 %).<sup>22</sup> Sextant 6 has a moderate resorption (22 %) followed by sextant 5 has a 21.2 %) of moderate resorption. Severe resorption seen in sextant 3(15 %). In the age group of (36 - 55) years of age (35 %) of patients have a moderate resorption and (16 %) of patients have a severe resorption. In the age group of (15 - 35) years of age (21.2 %) of patients have a severe resorption and (17.2 %) of patients have a moderate resorption. Figure 1 shows the frequency distribution of the age group of patients with external root resorption. 36-55 (51 %) age group of people more prone to have external root resorption.

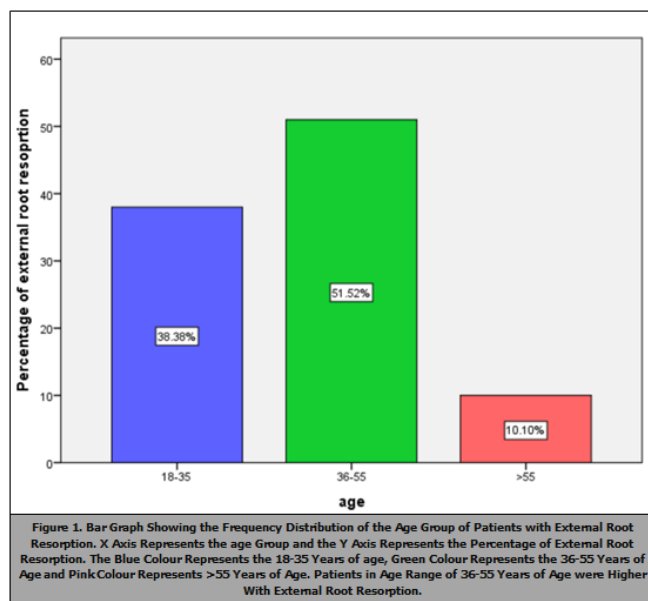


Figure 2 shows the frequency distribution of gender of patients with external root resorption. Female (60 %) are higher when compared to male (40 %) to have a root resorption.

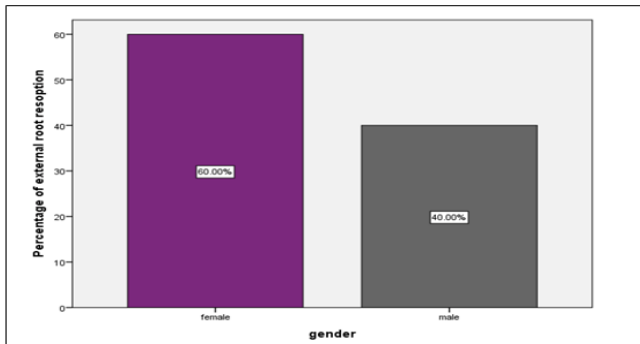


Figure 2. Bar Graph Showing The Frequency Distribution Of Gender Of Patients With External Root Resorption. X Axis Represents The Gender And Y Axis Represents The Percentage Of The External Resorption. The Purple Colour Represents The Female Which Were 60 % And Grey Color Represents The Male Which Were 40 %.

Figure 3 shows the frequency distribution of sextant of the tooth with external root resorption. External resorption most commonly occurs in sextant 6 (26.3 %) when compared to other sites.

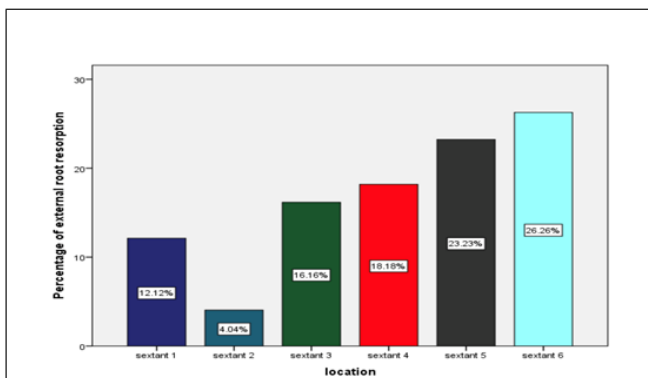


Figure 3. Bar Graph Showing The Frequency Distribution of Location Of The Tooth With External Root Resorption. X Axis Represents The Sextant And Y Axis Shows The Percentage Of External Root Resorption. Dark Blue Represents The Sextant 1, Blue Represents The Sextant 2, Green Represents The Sextant 3, Red Represents The Sextant 4, Black Represents The Sextant 5 And Sky Blue Represents The Sextant 6.

Figure 4 shows the frequency distribution of the type of resorption (62 %) of the resorption seems to be moderate.

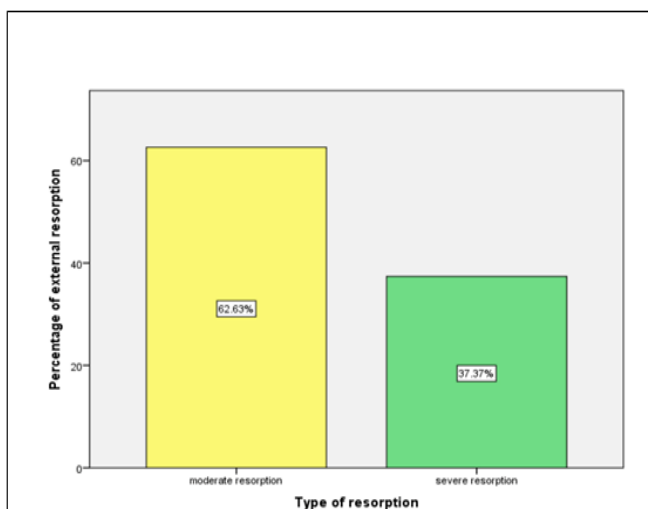


Figure 4. Bar Graph Showing The Frequency Distribution of Type of Resorption. X Axis Represents The Type Of Resorption And Y Axis Shows The Percentage Of External Root Resorption. Yellow Represents Moderate Resorption and Green Colour Represents Severe Resorption.

Figure 5 shows the association between the type of resorption and sextant of tooth. Sextant 6 is most common to have a moderate restoration (22 %).

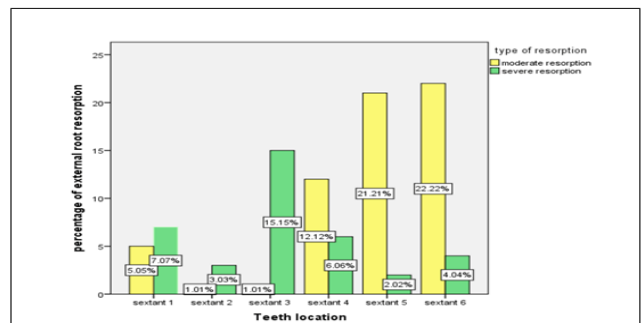


Figure 5. Bar Graph Showing The Association Between The Types Of Restoration With Location Of Tooth. The X Axis Represents The Sextant And The Y Axis Represents The Percentage Of Type Of External Root Restoration. Yellow Color Represents Moderate Restoration And Green Color Represents Severe Restoration. There is significantly higher incidence of moderate restoration in sextant 6. Chi square statistical test was done and p value was found to be 0.00 (p value<0.05, statistically significant).

Figure 6 shows the association between the type of resorption and age group. Moderate resorption most commonly occurs in the age group of 35 - 55 years of age (35 %).<sup>23-32</sup>

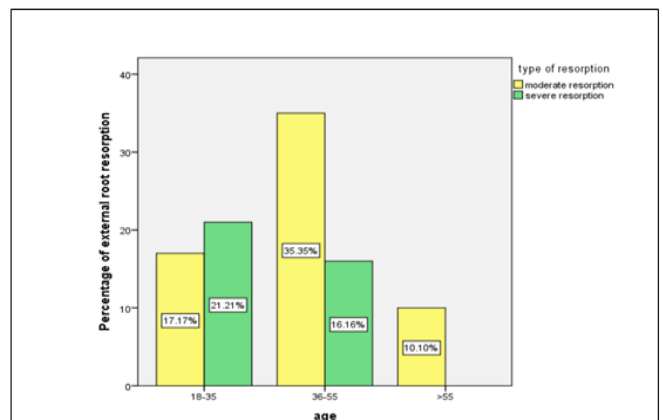


Figure 6. Bar Graph Showing the Association between the Type of Resorption With Age Group. X Axis Represents The Age Group And The Y Axis Shows The Percentage Of Type Of External Root Resorption. Yellow Color Represents Moderate Resorption And Green Color Represents Severe Resorption. There is significantly higher incidence of moderate resorption in the age group between 36-55 years of age. Chi Square Statistical Test Was Done And P Value Was Found To Be 0.00 (P Value<0.05, Statistically Significant).

## DISCUSSION

External root resorption is a pathological process which involves complex interactions between inflammatory cells, cytokines and various enzymes. The changes in the host cellular immune system may result in altering the resorption process and producing clinically significant external root resorption.<sup>31,32</sup> The most common causes of root resorption

are pulpal and periapical infections, orthodontic treatment, injury, cysts, neoplasia, systemic diseases or chemical injury.<sup>33,34</sup> Root resorption, the outer surface of the root is most commonly resorbed by odontoclasts. In radiographs, it appears as radiolucency on the external surface of the dentin with or without shortening of roots.<sup>35,36</sup> compared the accuracy of intraoral radiographs with CBCT for the detection of any resorption lesions in patients with internal resorption, external cervical resorption and no desorption. He found that the CBCT was more effective and gives best results in diagnosing resorption among the other imaging modalities. Also CBCT gives the true nature of the lesions in three dimensions.<sup>25,37</sup> They concluded that the intraoral radiography resulted in an acceptable level of accuracy in diagnosis of resorption.<sup>38-40</sup> found Periapical radiographs has a more reliable and valid method of detecting resorption than CBCT.<sup>41</sup> Cone-beam computed tomography systems<sup>25</sup> have better detection ability due to its higher radiation dose compared to intraoral radiograph limits its use for routine periapical lesions.<sup>42-44</sup> The extent of root resorption may affect the outcome of endodontic treatment, severe Root resorption may lead to open apex increasing the chances of obturating materials extruding into the periapical region.<sup>45-28</sup> This causes periapical irritation, initiate a foreign body reaction and possibly induce further root resorption.<sup>46-48</sup> Moreover, resorbed roots may pose difficulty in limiting the instrumentation due to the loss of cementum - dentine junction and to achieve the correct apical seal. The best way of evaluating Root resorption is by histopathological method, since intraoral radiographs are unable to detect the resorption in early stages, hence there is a tendency of under estimation of exact prevalence of root resorption.

### CONCLUSION

The present study was aimed to determine the prevalence of extra law root resorption in periapical radiographs seen in patients visiting dental college and hospitals. The results showed that the higher the prevalence of external root resorption seen among females compared to male. The most common age group to have an external root resorption is 35 - 55 years of age. External root resorption commonly seen in sextant 6 Thant other sides in oral cavity. Therefore, while treating long-standing periapical. Chronic long standing periapical pathologies could possibly have resorption which can be noticed in periodical radiographs. Hence, the dental clinician should consider the possibility of having resorption in long-standing inflammatory periapical pathologies.

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