EVALUATION OF DEAD SPACE IN ENDODONTICALLY TREATED MOLARS RESTORED WITH METAL POST IN A PRIVATE DENTAL INSTITUTION

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ABSTRACT:

Introduction: Endodontics is one of the branches in dentistry that deals with etiology, diagnosis and treatment of diseases and injuries which affect the dental pulp and the periapical tissues. The aim of this study is to evaluate the dead space in endodontically treated molars restored with metal posts in a private dental institution.

Materials and methods: This is a retrospective clinical study carried out by a private dental institution. This study analyses the dead space in endodontically treated molars with metal posts. The data was analysed over a period of 2 years between june 2019 and february 2021. Dental records including radiographs were collected for metal post and analysed the dead space based on the radiograph.

Results: A total of 431 patients have undergone metal post treatment in molars, in which 52.4% were males and 47.6% were females). The most common age group which had undergone metal post was from 18-30 years(42.5%). The most common affected molars were the lower molars (62.2%). 47.8% of the study population had 0mm of dead space. There was significant association between different age groups and the dead space.

Conclusion: The gap between the post and the obturating material(dead space) shouldn't be there as it can harbour microorganisms and can affect the prognosis of the tooth. Radiographic confirmation has to be done after the placement of the post for confirming the successful placement of the post.

Keywords: Metal post, endodontics, dead space, molars, novel method

INTRODUCTION:

Endodontics is one of the branches in dentistry which deals with the etiology, diagnosis and treatment of diseases and injuries which affect the dental pulp and the periapical tissues. The most common endodontic treatment done is root canal treatment which was shown in studies[1].

The main aim of endodontic treatment is thorough cleaning of the root canal of the infected pulp tissue where the canal can be shaped and is filled with an restorative material such as gutta percha which can help in control of the infection. Studies show that the success rate of endodontic treatment is almost 66%-98% [2–4]. Many factors can affect the presence of bacteria, inadequate filling of the canal,overextensions of root canal fillings, improper coronal seal, untreated canals, iatrogenic errors such as poor access cavity design[5–7]. Restoration of endodontic treated teeth impacts the prognosis of the tooth. Root canal treated tooth usually is associated with loss of coronal or radicular tooth structure. Posts are indicated for the root canal teeth which have less than 50% or more coronal structure which can decrease the occlusal load of the root canal tooth and prevent the loss or fracture of remaining tooth structure. A post provides a way to anchor the restorative material to the tooth where the post is inserted into the root canal of the endodontic treated tooth where the coronal portion of the tooth is built and a prosthetic crown can be placed on top of it[8–10]. Traditionally, posts were made with metal which were prefabricated or cast, carbon fiber posts were introduced to reduce the failure rate. Quartz and glass fibre posts were introduced to improve the aesthetics[11]. The gap between the post and the remaining root canal filling is known as the dead space.

Our team has extensive knowledge and research experience that has translated into high quality publications[12–21],[22–25],[26–30] [31]. Hence the aim of this study is to evaluate the dead space in endodontically treated molars restored with metal posts in a private dental institution.

MATERIALS AND METHODS:

It's a single centered retrospective study in a private dental institution, Chennai. The samples were taken from the patients who checked in From June 2019 to February 2021. Ethical clearance for this study was obtained from the institutional review board. The disadvantage of this study was it was not a multi centered study, trends and geographic location.

Two reviewers were involved in this study. The samples were taken from patients who checked in from June'19 to February' 21. The patient records were reviewed and analyzed. The data was collected based on metal posts placed in root canal treated molars . A total of 431 patients have matched the criteria. Internal validity includes metal posts placed in root canal treated molars. External validity is replication of results in different time periods.

The data was collected, verified, tabulated and analyzed. The data was imposed on SPSS and the technique used to quantify the data was Chi square. The statistical significance value is set at 0.05.

RESULTS AND DISCUSSION:

A total of 431 patients have undergone metal post treatment in molars, in which 52.4% were males and 47.6% were females(fig-1). The most common age group which had undergone metal post was from 18-30 years(42.5%), followed by 31-40 years(29.9%), 41-50 years(19.3%)

and 51 and years above(8.4%)(fig-2). The most common affected molars were the lower molars (62.2%) followed by the upper molars(37.8%)(fig-3). 47.8% of the study population had 0mm of dead space, 46.2% have 0.1-2 mm of dead space and 6% have more than 2 mm of dead space(fig-4). Chi- square analysis was done between different age groups and the dead space and there was significant association seen, $P>0.05$(fig-5).

Studies have shown that when there is an increase in age it can be a factor for oral health related problems such as chipping of enamel,exposure of dentin, periodontal problems such as gingival recession, tooth loss, discoloration of teeth, dental caries etc[32–35], which is contrary to the finding of this study where it showed that 18-30 years had more prevalence of post treatment, it might due to poor maintenance of oral hygiene and improper dietary intake.

Studies showed that lower molars are more susceptible to endodontic treatment due to their size and shape , molars function is to chew the food where the food is lodged, without thorough oral hygiene , dental caries is highly susceptible[36]

Studies show that metal post and fibre post have almost similar survival rates but metal post shows high incidence of root fracture[37]. Studies have shown that if there is a dead space existing it can be a good shelter to harbour microorganisms which impact the prognosis of the endodontic treatment[38,39]. In our study 47.8% had no dead space whereas the remaining study population had dead space which can make them susceptible to complications.

CONCLUSION:
 Within the limits of the study the 47.8% have no dead space which makes its prognosis more favourable whereas majority of the cases had dead space which makes their prognosis of their endodontic treatment poor as dead space can be a shelter of microorganisms.
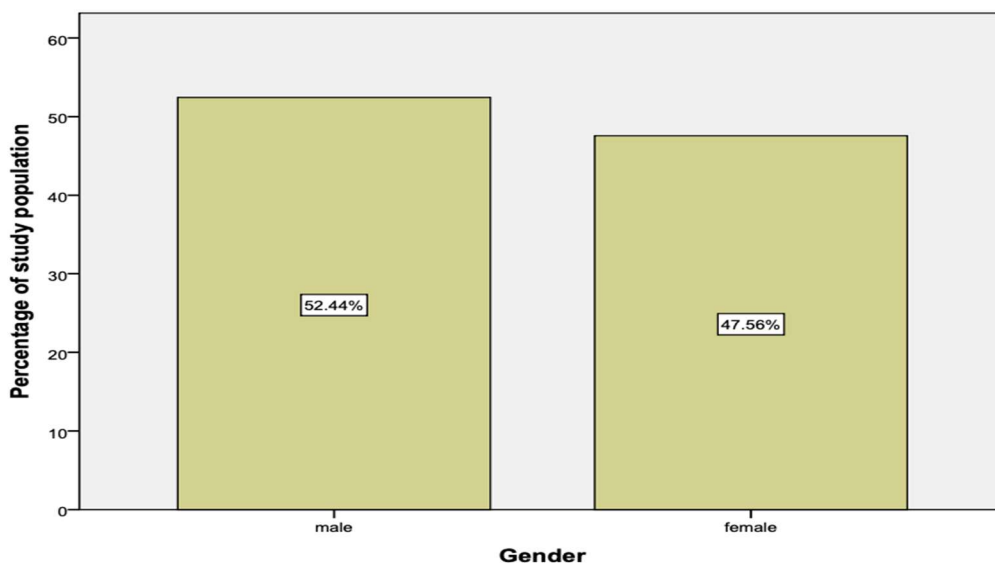
CONFLICT OF INTEREST: Nil

Figure-1: Bar chart depicting the gender distribution of participants with metal post. X Axis represents gender and Y Axis represents Percentage of study population
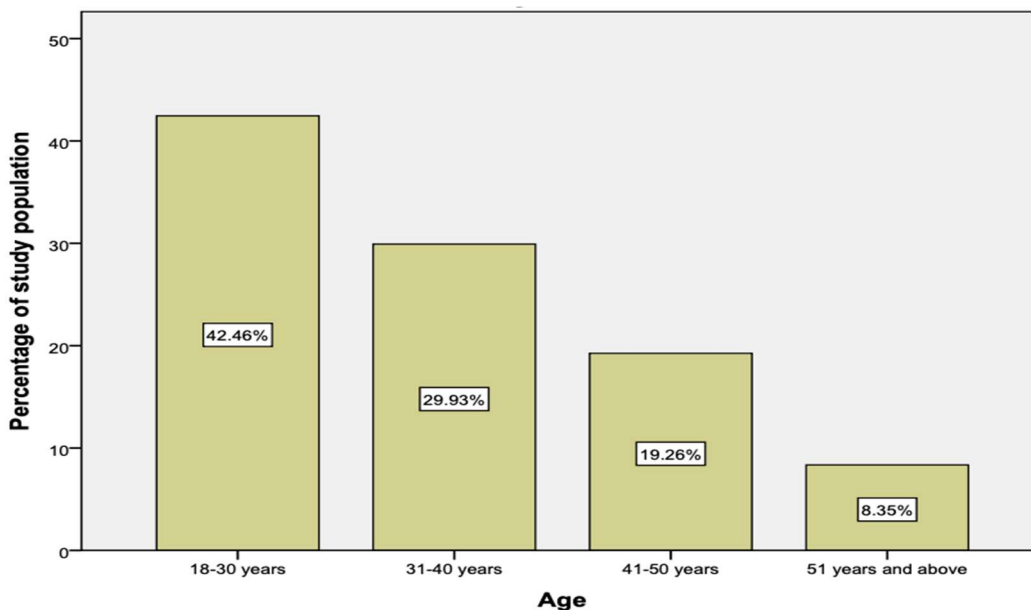

Figure-2: Bar chart depicting age wise distribution of participants with metal post. X Axis represents age groups of study population And Y Axis represents percentage of study population.
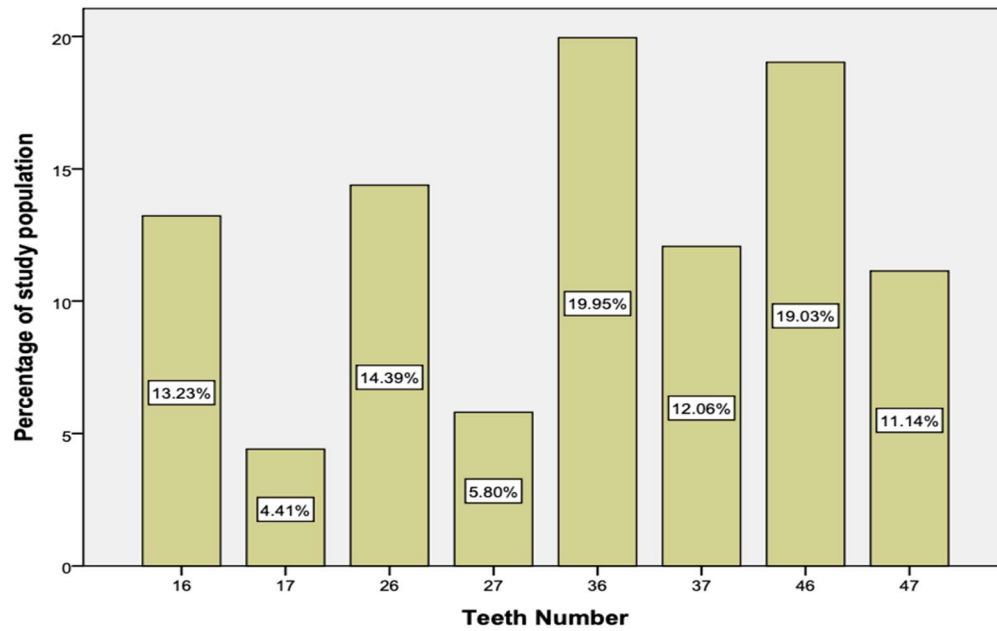
Figure-3: Bar chart depicting different teeth numbers with metal posts . X Axis represents Teeth number And Y Axis represents percentage of study population.
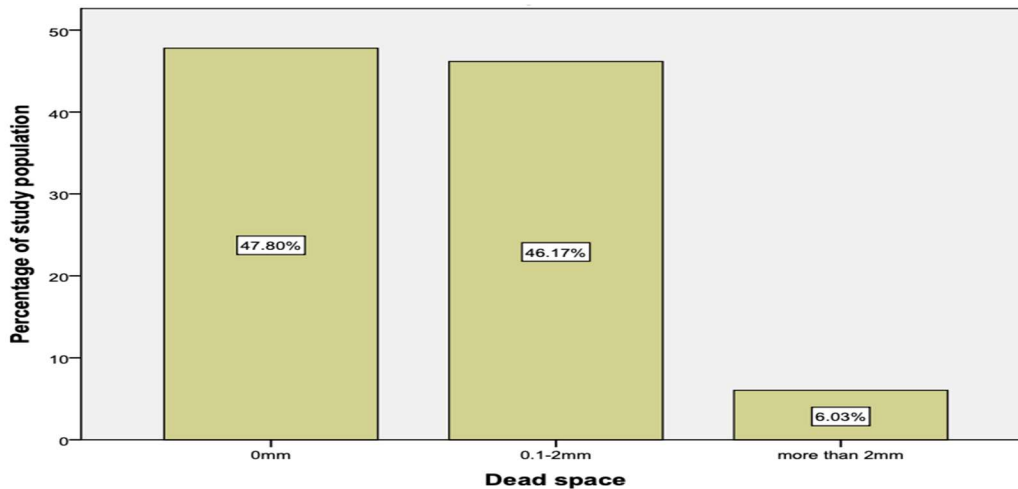

Figure-4: Bar chart depicting length of dead space in metal posts. X Axis represents length of dead space And Y Axis represents percentage of study population.
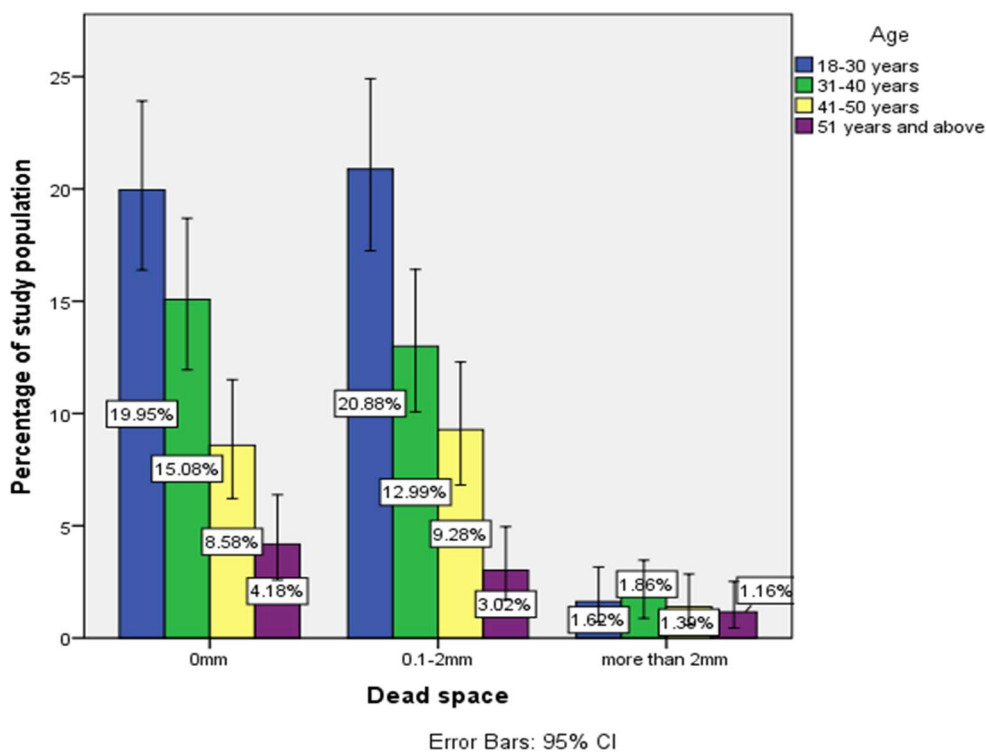
Figure-5: This error bar chart shows the correlation between different age groups and the length of dead space among patients with metal posts. Blue colour depicts the 18-30 years age group, 31-40 years represents green, 41-50 years is represented by yellow and more than 51 years is represented by purple. The X-axis represents the length of dead space and the Y axis represents the percentage of the study population. Chi-square analysis was done between age groups and length of dead space where it showed P>0.05 which is statistically not significant.

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