

**PREVALENCE OF OCCURRENCE OF EXTRACANAL IN LOWER MANDIBULAR ANTERIOR TEETH**

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**ABSTRACT**

**Introduction :**

Post-treatment endodontic disease is often a result of inadequate cleaning and shaping of root canal system. Teeth with unusual canal morphologies are probably more prone to treatment failures due to insufficient knowledge of canal anatomy and aberrations associated with it. The aim of this study was to find the prevalence of occurrence of Extracanal in lower mandibular anterior teeth.

**Materials and methods:**

A retrospective cross-sectional study was carried out which included the patient's details by assessing the report from June 2019 and May 2021. The inclusion criteria were : Patient's age, gender, Presence of extra canal and Teeth number. From this we obtained 21 patients who underwent Root Canal treatment . Data was tabulated in Excel and imported to SPSS. The type of statistical analysis used in this study was Correlation and Association.

**Results:**

From the results , we observed that People of the age range 41-60 years who received Root Canal treatment were at a higher rate (33.33%). Male patients who received Root Canal Treatment were at a higher rate (57.14%). Extra canals were present in 42 at a higher rate (23.81%). Presence of the MB2 canal was seen at a higher rate(52.38%). MB2 canal was present in a higher incidence among 21-40years age group people. Male patients were highly incidental having MB2 canal.

**Conclusion:**

MB2 canal was present in a higher incidence 42. Hence, identification of the extra canals and instrumentation is important in the prevention of unsuccessful treatment outcomes.

**KEYWORDS :** MB2, Middle Distal canal, Middle Mesial Canal, Root Canal Treatment

## **INTRODUCTION :**

The morphology of mandibular central and lateral incisors appears very similar. The root canal systems of the single-rooted teeth often have three pulp horns and one root canal, but some studies showed root canal anatomy of mandibular incisors is not as simple as it may appear to be on standard periapical radiographs, and that it may be complicated by the presence of bifurcated and lateral canals. The bifurcation of a root canal is the position at which a single canal splits into two smaller canals that follow divergent pathways; in some cases, these canals may rejoin to form a single canal again. Lateral canals are canals that emanate from the main canal but take a perpendicular course to exit into periodontal ligament space. Knowledge on both normal and abnormal anatomy of the root canal system states the parameters for execution of root canal therapy and it directly affects the results of endodontic therapy. Missed canals and accessory/lateral canals are a major reason for failure of root canal treatment[1]. All the teeth may have accessory root canals, with an increased occurrence of canal variation in permanent molars and premolars.[2] Prior knowledge of root canal anatomy is essential for the success of endodontic therapy [3] to remove bacteria from the root canal system and prevent reinfection and it is important to access all the canals in the tooth during the root canal treatment[4][5].

The aim of the root canal therapy is to eliminate[6] all the irritants from necrotic pulp tissue like microorganisms and their byproducts. The mechanism of Root Canal Treatment includes proper cleaning, shaping using proper instrumentation. The reported prevalence of MM and MD canals differs among various studies. Methods of detection which were used in other studies included plastic NaOCl[7], apex locators[8], dental microscopes[9], CBCT [10], and use of Dental loupes[11].

Studies on mandibular incisors have shown that about 11%-70% of these teeth possess two canals[2,12-16]. The prevalence of two separate apical foramina in these teeth has been reported to be 0.3%-10%[12-15,17-20]. The variations in the results may be attributable to several factors, one of which is the methodology of the study. Studies using radiography alone have generally shown low prevalence of two-canaled incisors (1.3%-18.7%)[21-25]. However, when two radiographs with different angulations were used, or when radiopacifiers were injected into the canals or endodontic files were placed in the canal prior to taking radiographs, higher prevalence (30%-61.5%) of two-canaled incisors were reported. Studies using the clearing and staining technique have also shown high prevalence of two-canaled incisors. Other factors such as differences in race and sex of the study population may be responsible for the slight differences in the results[15] Our team has extensive knowledge and research experience that has translate into high quality publications[26-35],[36-39],[40-44][45] Hence, the aim of this study is to find the Prevalence of occurrence of Extracanal in lower mandibular anterior teeth .

## **MATERIALS AND METHODS:**

### **2.1. Study Setting**

A retrospective study was carried out among patients in a University hospital setting. This is based on a university setting because data available was in the similar ethnicity with the particular geographic location. The trends in the other locations that were not assessed in the study setting. Ethical approval was taken from the universal ethical committee. In total, three reviewers were involved to cross verify data.

### **2.2. Sampling**

The sample was collected from records with patients' data like : PID, Name, Age, ,Shade used, Teeth number, Gender and Date of their first visit from June 2019 to June 2021 and tabulation was done in a chronological order using Excel. Case sheet review was done under the examiner followed by cross verification.

The study sample size included patients who underwent Anterior Class III restorations and data retrieved was n=21, out of which 12 were males and 9 were females. Statistical method used in this study was the Chi-Square test and the software was SPSS by IBM. Patients who underwent Root canal treatment with presence of extra canal in the lower anteriors were considered as dependent variables and their Age, Teeth number, Presence of Extracanal and Gender were considered as a definite variable. The type of analysis used was Correlation and association which is a descriptive type of data analysis.

## **RESULTS:**

From this, we observed that People of the age range 41-60 years who received Root Canal treatment were at a higher rate (33.33%), people of >60years (28.57%), 21-40years (23.81%) and <20years (9.52%) less comparatively (Figure - 1). Male patients who received Root Canal Treatment were at a higher rate (57.14%) than Females (42.86%)(Figure -2). Extra canals was present in 42 at a higher rate (23.81%) than 41,32 (19.05%), 31,33 (14.29%), 43(9.52%)(Figure -3). Presence of the MB2 canal was seen at a higher rate(52.38%) than Middle Mesial Canal (33.33%), Middle Distal Canal(14.29%)(Figure -4). MB2 canal was present in a higher incidence among 21-40years age group people in association with the presence of extra canal present(Figure -5). Male patients were highly incidental having MB2 canal was in association having extra canal (Figure - 6). MB2 canal was present in a higher incidence 42 were in association with the presence of extra canal present(Figure - 7).

## **DISCUSSION :**

People of the age range 41-60 years who received Root Canal treatment were at a higher rate (33.33%), people of >60years (28.57%), 21-40years (23.81%) and <20years (9.52%) less comparatively (Figure - 1). Male patients who received Root Canal Treatment were at a higher

rate (57.14%) than Females (42.86%)(Figure -2). Extra canals were present in 42 at a higher rate (23.81%) than 41,32 (19.05%), 31,33 (14.29%), 43(9.52%)(Figure -3). Presence of the MB2 canal was seen at a higher rate(52.38%) than Middle Mesial Canal (33.33%), Middle Distal Canal(14.29%)(Figure -4). MB2 canal was present in a higher incidence among 21-40years age group people in association with the presence of extra canal present(Figure -5). Male patients were highly incidental having MB2 canal was in association having extra canal (Figure - 6). MB2 canal was present in a higher incidence 42 were in association with the presence of extra canal present(Figure - 7).

As reported, more than 40% of mandibular incisors have two canals and more than 1% have two separate apical foramina [46]. According to another study, 15% of the teeth studied showed a bifurcated canal, 7.7% had a lateral canal, and 25% had an accessory canal, which was defined as a secondary canal that emanated from the main canal and travelled at an angle alongside it before exiting into the periodontal ligament space [47]. After examining 1085 transparent specimens of extracted mandibular incisors, Migashita et al. reported that more than 85% of those teeth possessed a single canal[20]. They also reported that 3% of the specimens with furcations possessed two separate canals .Benjamin and Dowson[12] found that of their total sample of 364 mandibular incisors, 151 (41.4%) had two separate[20]

### **Limitations of the study**

The study was undertaken with a small sample size hence, it should be generated to a larger population. This altered response was obtained because of the absence of patients own perception which was affected by the time of calling, social factors.

### **Future Scope**

Study for a larger population should be done. For the diagnosis and treatment planning of all patients should be recorded.

### **CONCLUSION :**

Within the limits of the study, it was concluded that MB2 canal was the most extracanal present in 42 with Male predilection. Furthermore studies to be done in a larger sample to avoid confusions. Success of Root canal treatment lies in claming all the canals and analysing the tooth morphology.

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## CONFLICT OF INTEREST: None

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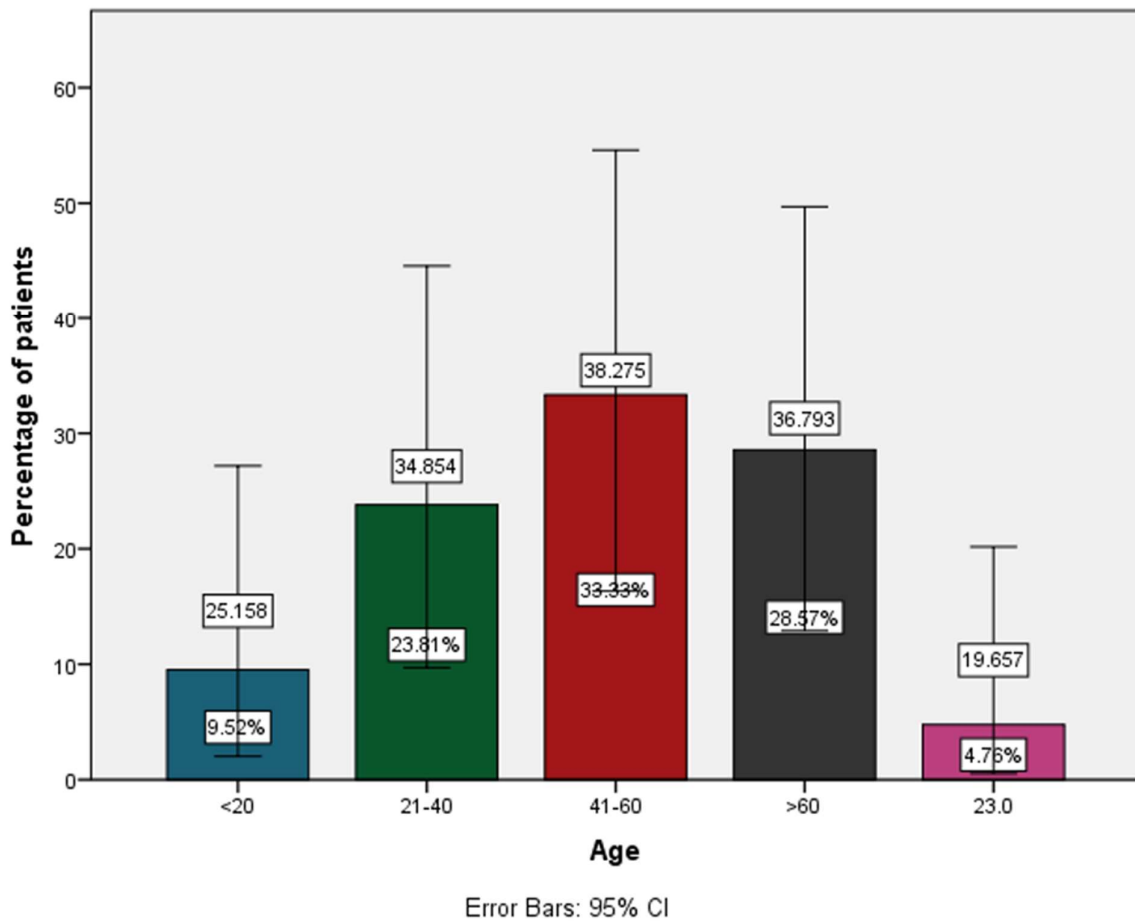
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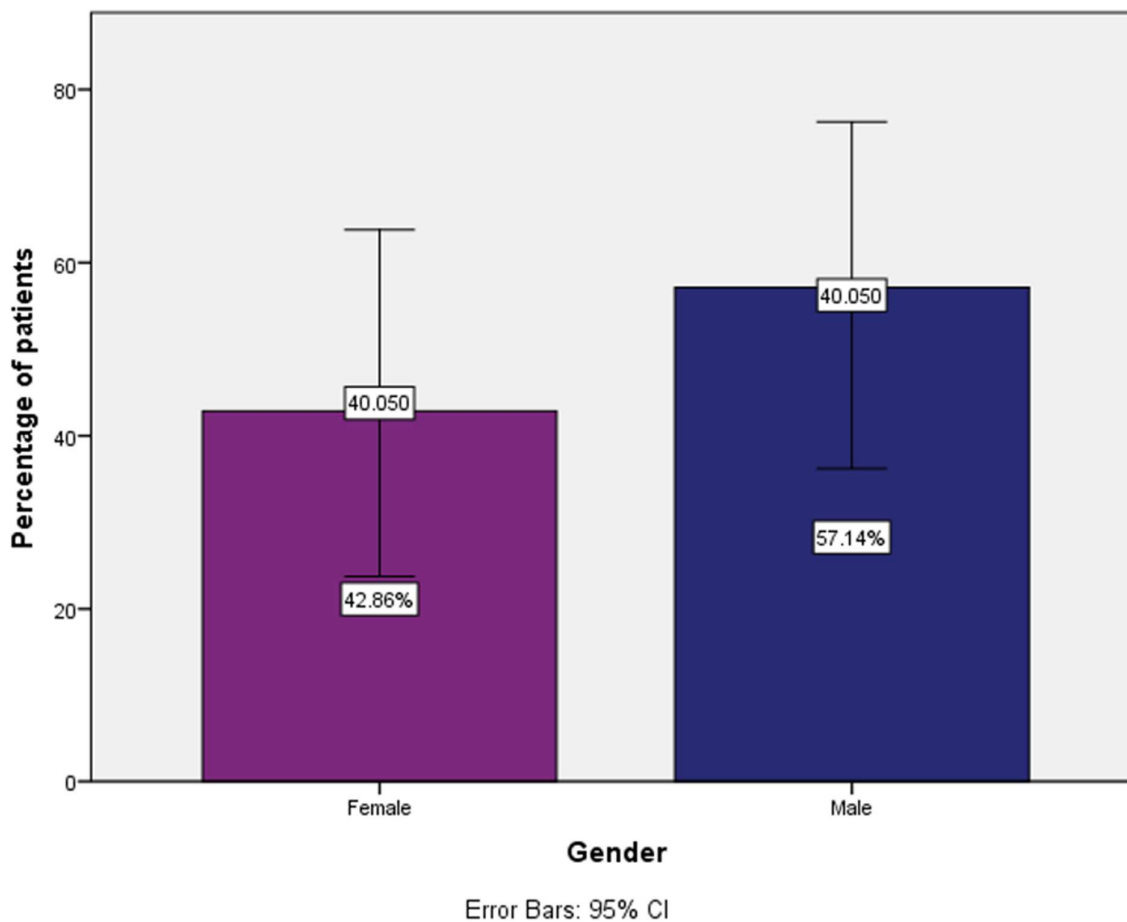
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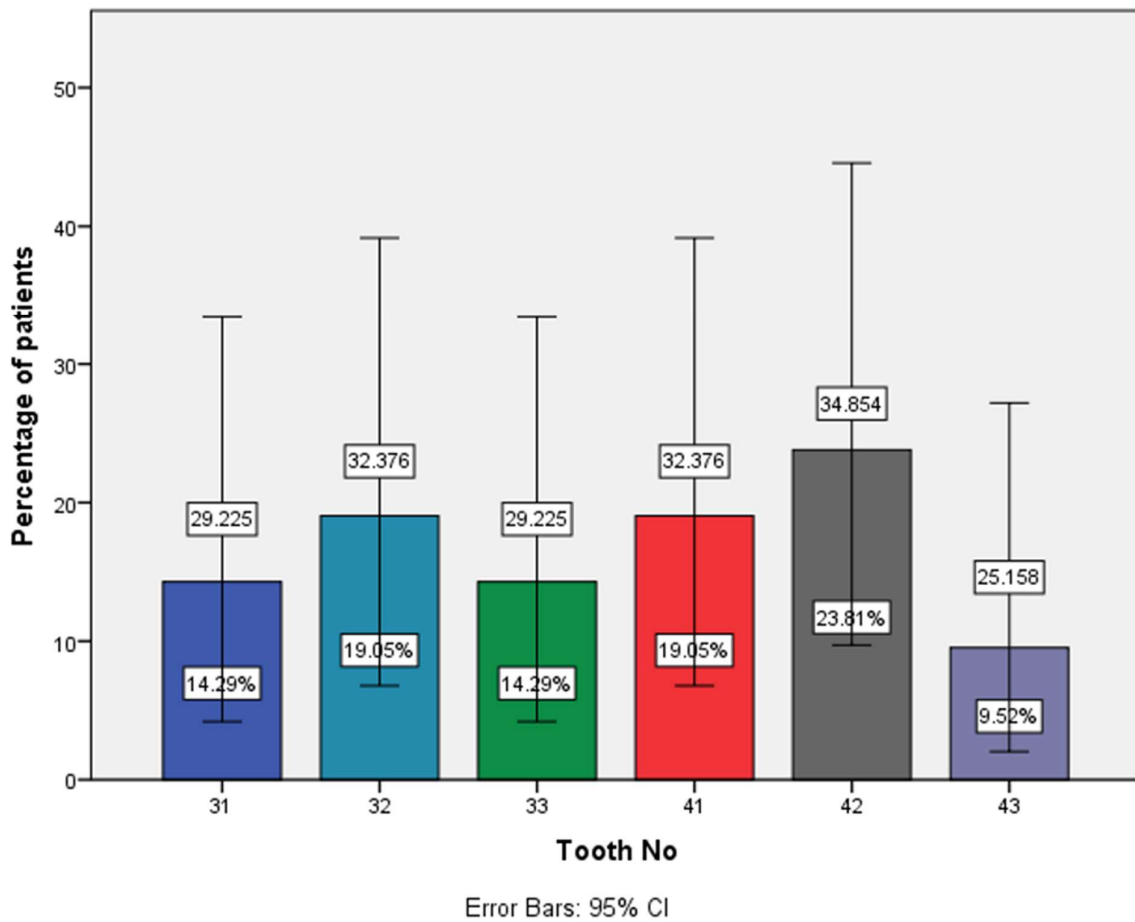
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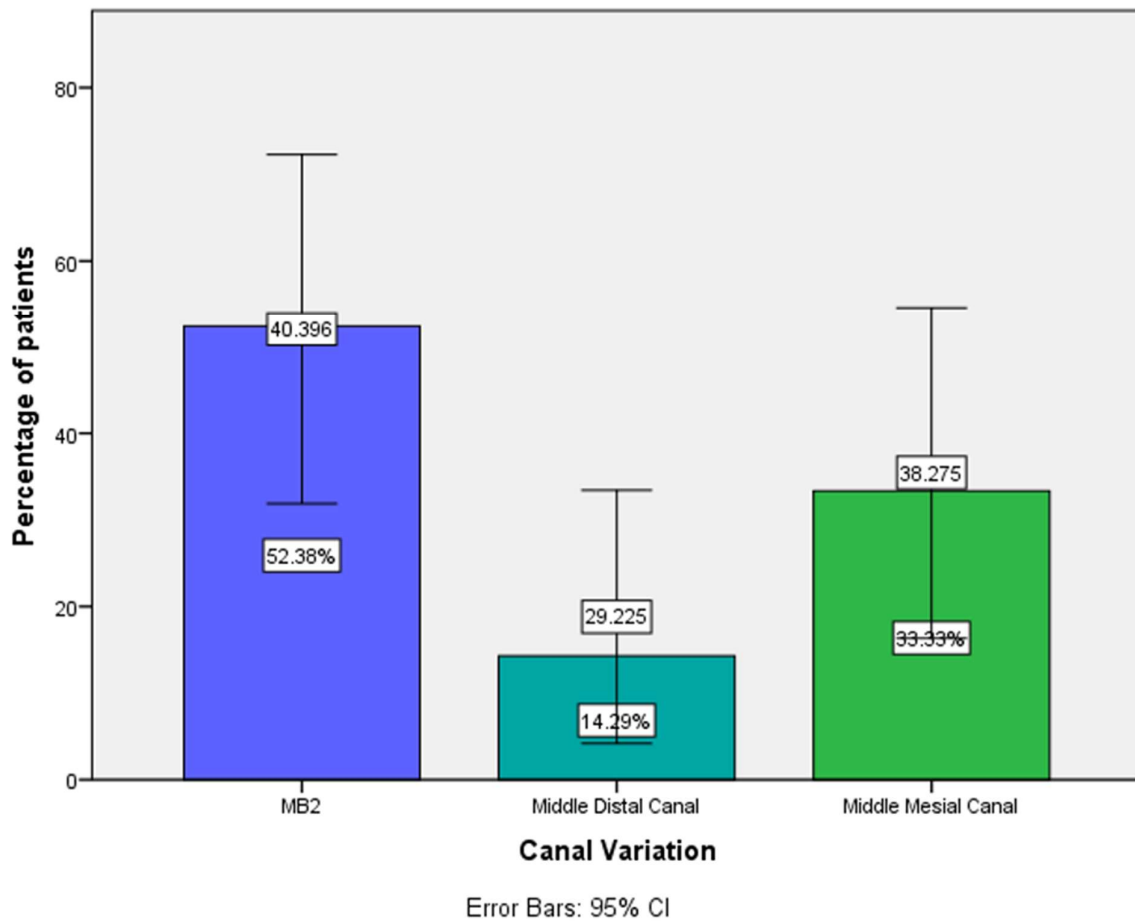
**Figure-1** shows the bar graph of distribution of age among people who underwent Root canal treatment. The age group of patients were mentioned in X-axis which were categorized as <20years , 21-40years, 41-60years and >60years and the percentage of patients who underwent Root canal treatment were mentioned in Y-axis. Of these, people of the age range 41-60 years who received Root Canal treatment were at a higher rate (33.33%), people of >60years (28.57%), 21-40years (23.81%) and <20years (9.52%) less comparatively.



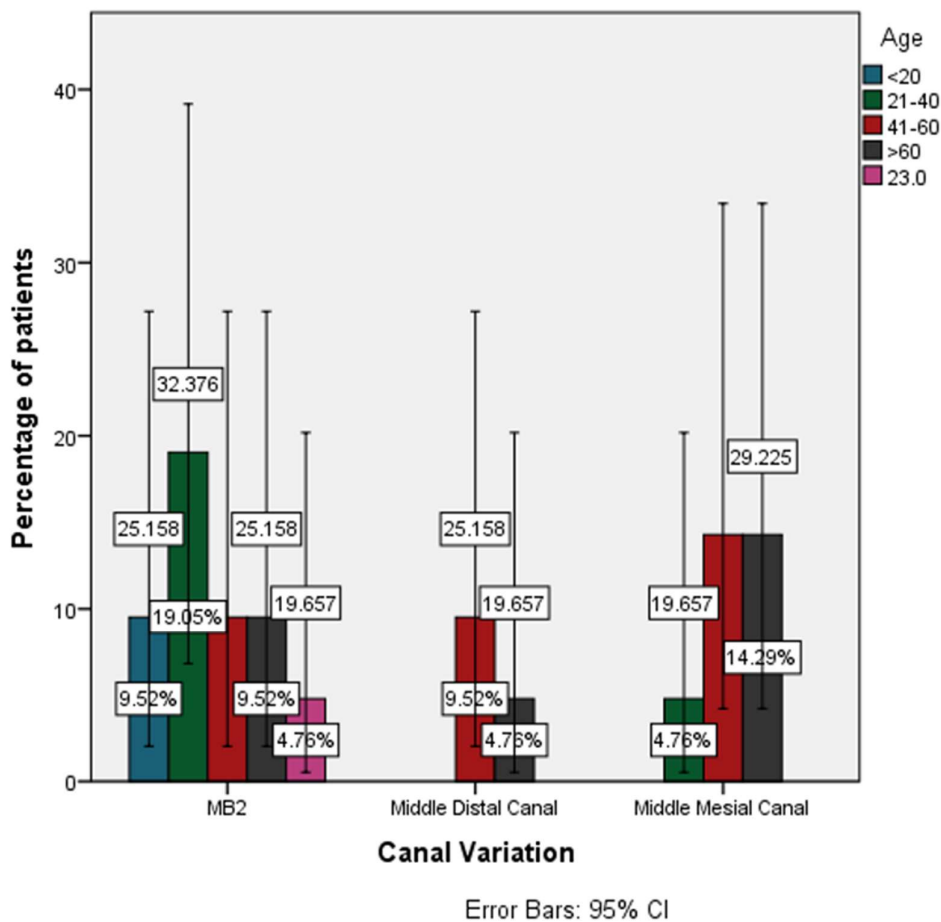
**Figure-2** shows the bar graph of distribution of Gender among people who underwent Root Canal Treatment. The Gender of patients were mentioned in X-axis which were categorized as Female and Males and the percentage of patients who received Root Canal Treatment were mentioned in Y-axis. Of these, people of the Male patients who received Root Canal Treatment were at a higher rate (57.14%) than Females (42.86%).



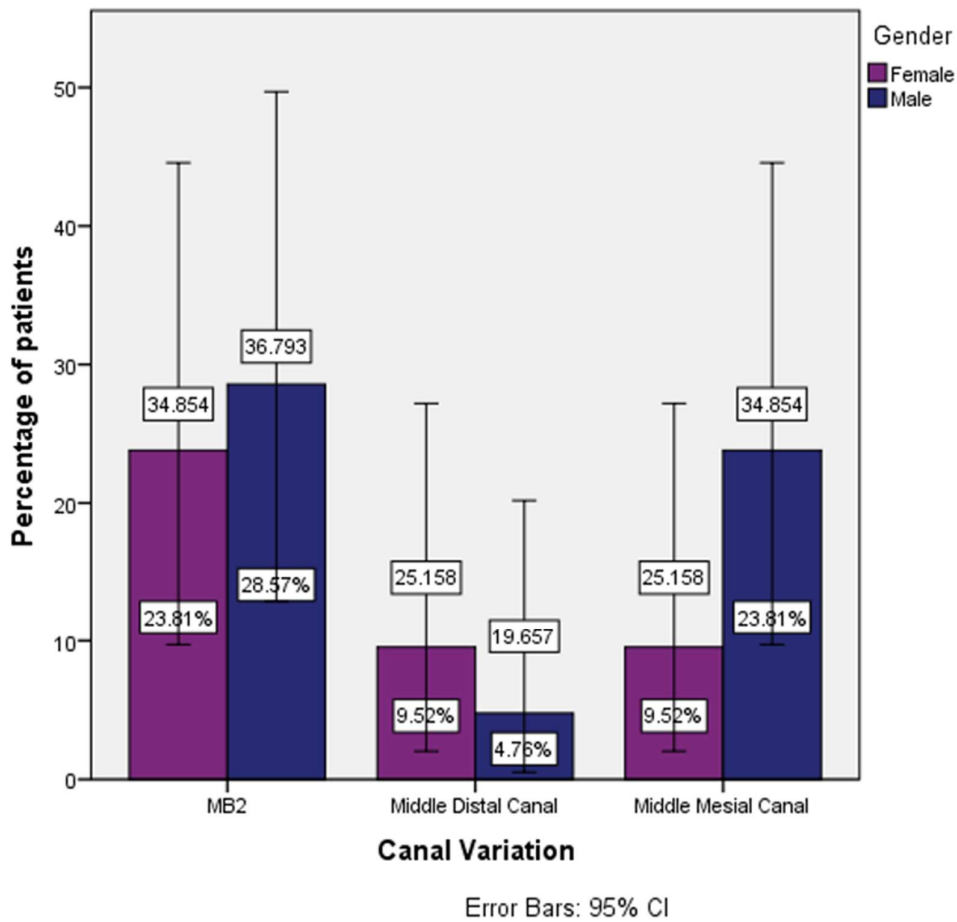
**Figure-3** shows the bar graph of distribution of teeth indicated among people who underwent Root Canal Treatment. The teeth indicated for restoration of patients were mentioned in X-axis which were categorized as 31,32,33,41,42,43 and the percentage of patients who received Class 3 restoration were mentioned in Y-axis. Of these, teeth with extra canals were present in 42 a higher rate (23.81%) than 41,32 (19.05%), 31,33 (14.29%), 43(9.52%).



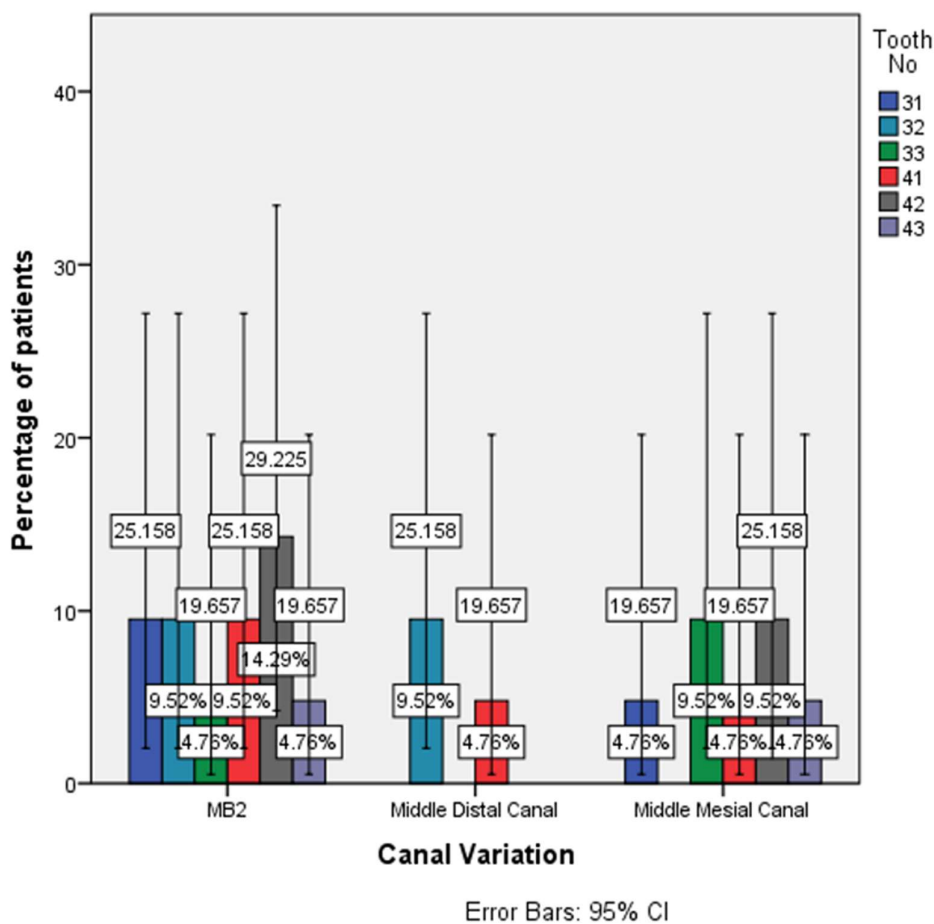
**Figure-4** shows the bar graph of distribution of extracanal present among patients who underwent Root Canal Treatment. The presence of extra canals were mentioned in X-axis which were categorized as MB2, Middle Distal Canal and Middle Mesial Canal and the percentage of patients who received Root Canal Treatment Were mentioned in Y-axis. Of these, presence of the MB2 canal was seen at a higher rate(52.38%) than Middle Mesial Canal (33.33%), Middle Distal Canal(14.29%).



**Figure 5** shows the bar graph representing the association between presence of extracanal and age of patients who received Root Canal Treatment where X-axis represents the presence of extra canal association with age and Y-axis represents the count of patients who received Root canal treatment. MB2 canal was present in a higher incidence among 21-40years age group people in association with the presence of extra canal present.  $p$ -value  $>0.05$ (Chi-square value - 7.324<sup>a</sup>; P-value : 0.502). Hence, it is statistically significant.



**Figure 6** shows the bar graph representing the association between presence of extracanal and gender of patients who received Root Canal Treatment where X-axis represents the presence of extra canal association with gender and Y-axis represents the count of patients who received Root canal treatment. Male patients were highly incidental having MB2 canal was in association having extra canal.  $p$ -value  $>0.05$ (Chi-square value - 1.308<sup>a</sup>; P-value : 0.520). Hence, it is statistically insignificant.



**Figure 7** shows the bar graph representing the association between presence of extracanal and Tooth involved who received Root Canal Treatment where X-axis represents the presence of extra canal association with Tooth involved and Y-axis represents the count of patients who received Root canal treatment. MB2 canal was present in a higher incidence 42 were in association with the presence of extra canal present.  $p$ -value  $>0.05$ (Chi-square value - 8.791<sup>a</sup>; P-value : 0.552). Hence, it is statistically significant.