Missing maxillary first molar in young adult and it's replacement – A retrospective study

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ABSTRACT

Retrospective research was performed among patients attending one of Chennai's private hospitals. The purpose of the research is to examine the incidence of missing maxillary first molar and its replacement in the young adult population. The patients were assessed using the records from the university between June 2019 and March 2020. The data were entered into Microsoft Excel and tabulated. Following which data was imported into the SPSS software by IBM. Data analysis was performed in the statistical software SPSS and data were analyzed by descriptive analysis and Pearson correlation. Patients belonging to the age group, 18-35 with missing maxillary first molar, were selected for the study. The patients undergoing replacement of the missing teeth were evaluated. In this study, we observed that a total of 358 patients had missing maxillary first molar. From a total of 358 patients, 95 patients (26.5 %) underwent replacement of the missing teeth, and 263 (73.46%) did not undergo replacement. The patients who underwent replacement treatment predominantly belonged to the age group 26 to 35 years. A maximum number of patients who underwent treatment belong to the male population (15.92%) [p-value > 0.05]. The type of replacement procedure underwent mostly Temporary partial denture (11.7%), followed by Fixed partial Denture. The maximum number of patients with missing maxillary first molar belongs to the male population of the patients aged 26 to 35 years (42.18%) [P-value ⬚0.05].

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INTRODUCTION

Oral health is an integral part of general health (Basha *et al.*, 2018). Permanent teeth loss may have adverse physical, psychological, and social implications, especially for children and adolescents with skeletal anatomy under growing growth. Due to the adverse implications on eruption phenomenon, the cohesion of the arches, the key roles of chewing, drinking, coughing, and speech, permanent teeth extraction should not be an unnecessary operation. The first permanent teeth to erupt are the first molar, and these teeth form the key

of occlusion, and it defines the appearance of the lower portion of the face and dictates the location and quality of the other permanent teeth (Dental Association, 2006; Kannan and Venugopalan, 2018). This is the last tooth in the oral cavity during this time, so the flexibility and agility to preserve oral hygiene are difficult.

Furthermore, the deep pit and fracture existence of the first molar renders it more vulnerable to food shelter than most teeth, which in effect contributes to dental caries. Negligence in the diagnosis of dental caries at the first level and lack of sensitivity in the management of dental caries following symptomatic pulp damage contribute to loss of teeth (Çağlaroğlu *et al.*, 2008; Vijayalakshmi and Ganapathy, 2016). Increased life expectancy and an increase in population, creates high demand in dental care, especially in the field of prosthodontics (Ashok and Suvitha, 2016).

Permanent first molar teeth typically develop when the infant reaches six years old. The first permanent molar has deemed a barrier to occlusion, and its early failure due to caries may have a major effect on potential dental care (Ebrahimi and Ajami, 2010; Jyothi *et al.*, 2017). The first permanent molar often tends to control facial height, facial development, anterior-posterior and transverse development in both jaws (Varshney *et al.*, 2018). Loss of first permanent molars owing to dental caries has a detrimental impact on all arches and harmful effects on occlusion. Early loss of such teeth is recorded to result in tilting of adjacent teeth to hollow areas, opposing teeth supra-eruption, unilateral chewing, midline change, and dental malocclusion. The first permanent molar has been identified as the most vulnerable to caries in permanent dentition, presumably owing to its early introduction to the oral atmosphere (Gill *et al.*, 2001).

A major part of dental hygiene is prosthetic removal in damaged teeth. Patients with a single damaged tooth can be provided with flexible partial dentures, resin-bonded partial dentures (RBFPDs), permanent partial dentures strengthened by the tooth (FPDs), and implant-retained crowns (IRCs). Single tooth extraction without tooth restoration is also an effective form of care (Torabinejad *et al.*, 2007). Molars are one of the first teeth to be lost in life; thus, their replacement is always needed. Implantation is usually the best alternative to remove a lost single tooth preventing the planning of essential teeth and the manufacture of bridges. The positioning of molar replacement implants poses medical, therapeutic, and prosthetic criteria, such as expanded mesiodistal aspect and distribution of

occlusal movements (Özkurt and Kazazoğlu, 2010; Duraisamy and Krishnan, 2019). The purpose of the research is to examine the incidence of missing maxillary first molar and its replacement in the young adult population.

MATERIALS AND METHODS

The study evaluated patients visiting a private hospital in Chennai. The retrospective evaluation of the data of 86,000 patients who visited between June 2019 and March 2020 was analyzed. The patients belonging to the age group 19 to 35, with missing or extracted maxillary first molar were included in the study, and the treatment modalities undertaken by the patient were recorded. Data were entered into Microsoft Excel and tabulated followed by analysis on the SPSS software by IBM. Data analysis was performed in the statistical software SPSS and data were analyzed by descriptive analysis and Pearson correlation. Internal and external validity were present. Data validation was verified by the reviewer of the study. The data obtained was cross verified by the intraoral photographs and radiographs of the respective case sheet of the patient. To exclude the possibility of bias from the study, incomplete data were excluded from the study.

RESULTS AND DISCUSSION

In this study, we observed that a total of 358 patients had missing maxillary first molar. From a total of 358 patients, 95 patients (26.5 %) underwent replacement of the missing teeth, and 263 (73.46%) did not undergo replacement.

The study population consisted of people belonging to the young adult population. They were distributed into 18 to 25 years and 26 to 35 years. The X-axis denotes the age of the patient, and the Y-axis denotes the number of patients with missing maxillary first molar. More number of patients belonged to the age group 26 to 35 years (green) (73.74%), compared to the age group 18 to 25 years (blue)(26.25%) [Figure 1]. More patients belonged to the age group 26 to 35 years (73.74%), compared to the age group 18 to 25 years (26.25%). The distribution of the study population according to gender revealed, more number of patients belonged to the male population (60.61%), compared to the females (39.38%). The X-axis denotes the gender of the patient, and the Y-axis denotes the number of patients with missing maxillary first molar. More number of patients belonged to the male population (blue) (60.61%), compared to the females (pink)(39.38%) [Figure 2]. The association between the gender of the study population and age was done

using the Chi-square test (p-value =0.027). The maximum number of patients with missing maxillary first molar belongs to the male population of the patients aged 26 to 35 years (42.18%). However, this is statistically insignificant. The X-axis denotes the age distribution, and the Y-axis denotes the number of patients with missing maxillary first molar. The maximum number of patients with missing maxillary first molar belong to the male population (blue) of the patients aged 26 to 35 years (42.18%), and the least belongs to the female population (pink) of age group 18 to 25 years (Chi-square test; p-value = 0.027). Hence, there is no significant association between age and gender of the patients with missing maxillary first molar [Figure 3]. Hence, there is no association between the gender of the study population and age.
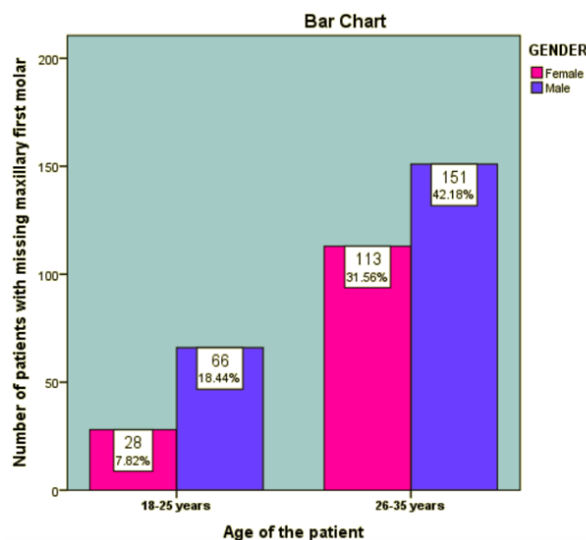

Figure 3: Bar chart showing the association between age and gender of the patients with missing maxillary first molar
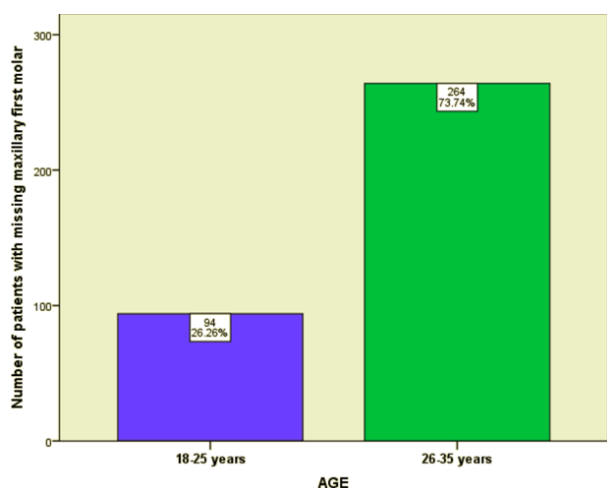

Figure 1: Bar chart showing the distribution of age of the patients with missing maxillary first molar
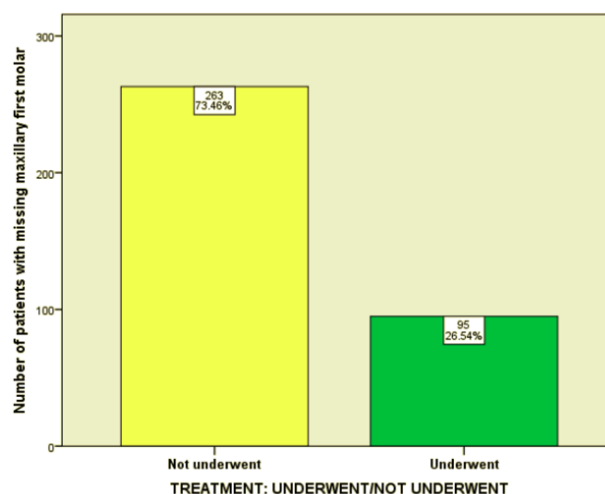

Figure 4: Barchart showing the distribution of treatment status of patients with missing maxillary first molar among the middle-aged population
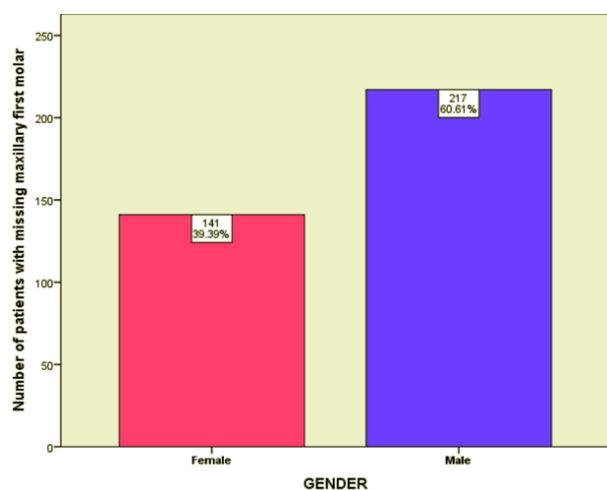

Figure 2: Bar chart showing the distribution of gender of the patients with missing maxillary first molar

The treatment status of the study population was assessed and evaluated. Around 73.46% of the study population did not undergo any treatment for the replacement of missing teeth. Whereas, 26.53% underwent replacement of missing maxillary molars. The X-axis denotes treatment status, and Y-axis denotes the number of patients. Around 73.46% of the study population did not undergo any treatment (yellow) for the replacement of missing teeth. Whereas, 26.53% underwent replacement (green) of missing maxillary first molars [Figure 4].

The association between the treatment status and age of the patients was done using the chi-square test. The patients who underwent replacement treatment predominantly belonged to the age group
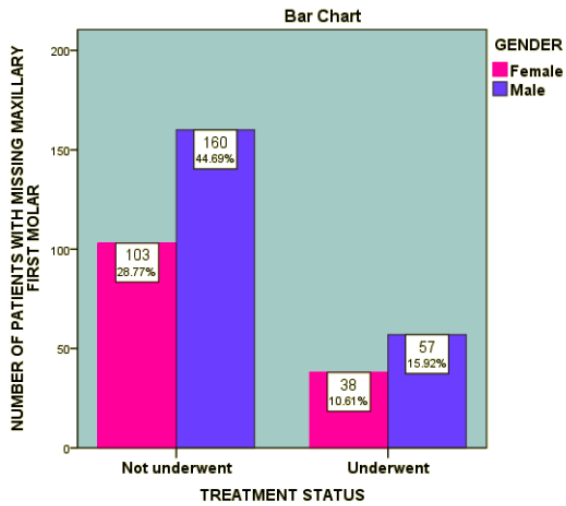
Figure 5: Barchart showing an association between the treatment status of the missing maxillary first molar and the gender of the study population

Figure 7: Barchart showing the distribution of patients based on the type of treatment of missing maxillary first molar
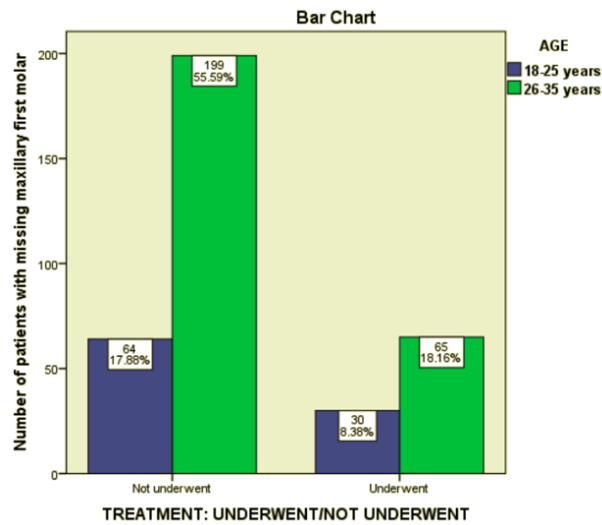

Figure 6: Barchart showing an association between the treatment status of the missing maxillary first molar and the age of the study population

Figure 8: Bargraph showing the association between age and type of treatment of missing maxillary first molar

26 to 35 years. However, this is statistically not significant. Hence, there is no association between the treatment status and age of the patients.

The association between the treatment status and gender of the patients was done using the chi-square test [p value =0.886]. A maximum number of patients who underwent treatment belong to the male population (15.92%). However, this is statistically not significant. Hence, there is no association between the treatment status and gender of the patients. The X-axis denotes the treatment status of the study population, and the Y-axis denotes the number of patients with missing max-
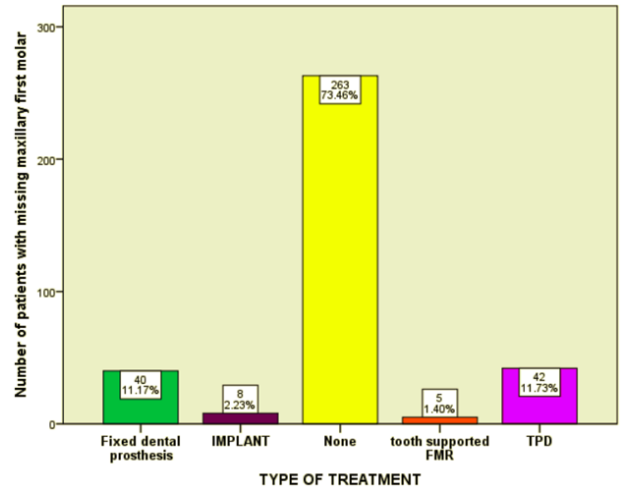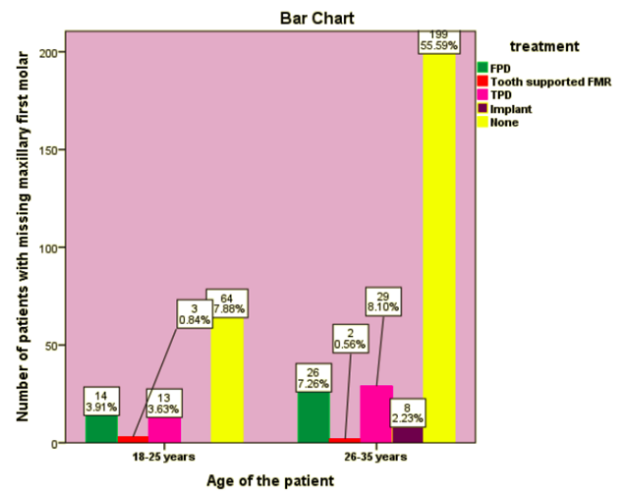
illary first molar. A maximum number of patients who underwent treatment belong to the male population (blue) (15.92%). (Chi-square test; p-value = 0.886). Hence, there is no significant association between the treatment status of the missing maxillary first molar and the gender of the study population [Figure 5].

The patients who underwent replacement treatment predominantly belonged to the age group 26 to 35 years [p value =0.169]. However, this is statistically not significant. Hence, there is no association between the treatment status and age of the patients. The X-axis denotes the treatment status of the study population, and the Y-axis denotes the number of patients with missing maxillary first molar. The patients who underwent replacement treatment predominantly belonged to the age group

26 to 35 (green) years [p value =0.169]. However, this is statistically not significant. Hence there is no association between the treatment status and age of the patients [Figure 6].

The type of replacement procedure undergone by the patients was evaluated. Most patients underwent replacement by Temporary partial denture (11.7%), followed by Fixed partial Denture. The X-axis denotes the type of treatment, and the Y-axis shows the number of patients. Most patients underwent replacement by Temporary partial denture (purple) (11.7%), followed by fixed partial Denture (green) (11.17%). However, 73.46% underwent no treatment (yellow) (73.46%) [Figure 7]. Among the age group 18 to 25 years, the maximum number of patients did not undergo treatment (7.88%), 3.91% underwent FPD. And among the age group, 26 to 35 years maximum didn't undergo treatment (55.59%). The X-axis denotes the age distribution of patients with missing maxillary first molar, and the Y-axis denotes the number of patients with missing maxillary first molar. Among the age group 18 to 25 years, the maximum number of patients did not undergo treatment (yellow) (7.88%), 3.91% underwent FPD (green). And among the age group, 26 to 35 years maximum didn't undergo treatment (yellow)(55.59%), and 8.10% underwent TPD (pink). (Chi-square test ; p-value = 0.080 - not significant). Hence, there was no significant association between age and type of treatment of missing maxillary first molar [Figure 8]. The association between age and type of replacement of missing maxillary first molar undergone by the study population was assessed using the Chi-square test (p-value = 0.080). However, this is statistically not significant. Hence there is no association between the age and type of replacement of missing maxillary first molar.

Out of a total of 358 patients with missing maxillary first molar, 95(26.5 %) underwent replacement of it, and 199 (55.5%) did not undergo replacement. The patients who underwent replacement treatment predominantly belonged to the age group 26 to 35 years. The type of replacement procedure underwent was mostly Temporary partial denture (11.7%), followed by Fixed partial denture (11.2%), Implant, and FMR.

According to a study by Hegde and Ragavendran (2012) on the South Indian population, the depletion of the first molar throughout the five years is roughly 3606, with a frequency of approximately 36.06%. Among these 3606 first molar cases, 3413 had just one first molar missing, and 193 had several molars missing. It may be attributed to the patient's knowledge of the failure of the first tooth and the risk of missing other teeth. According to Vignarajah (1993), the greater prevalence of tooth loss among permanent teeth was seen in age 40 years and below (Jain, 2018). This is in agreement with the current study as the study population with missing maxillary first molar predominantly belongs to the age group 35 years and below. According to a study by Özkurt and Kazazoğlu (2010), 46.3 % of the sample had FPD restorations, and 23 (10.6 %) had IRCs. Ninety-four (43.1 %) patients received no rehabilitation; these findings are in agreement with the current study, where 55.5% of the population did not undergo any restoration of missing teeth. However, in his study, patients preferred FPDs, contradictory to this study. Previously our team had conducted clinical trials (Ashok *et al.*, 2014; Ganapathy and Sathyamoorthy, 2016) and analyzed reviews (Selvan and Ganapathy, 2016; Subasree *et al.*, 2016).

CAD/CAM technique offers a great advantage over conventional processing techniques by eliminating clinical steps in impression making and laboratory steps including cast and model pouring, articulation, die sectioning, casting, and subsequent layering, thus conserving time and workforce (Jain *et al.*, 2017) over the past 5 years. The determination to replace permanent teeth must be considered and incorporated into a comprehensive recovery program that also includes coordination with other dental professionals. Examination of the factors of irreversible dental impairment is of concern to clinicians and decision-makers in designing prevention mechanisms to be incorporated into the broader public health dental services. The public must be fully aware of their rehabilitation options, and it is, therefore, important to highlight the detrimental drawbacks of not restoring damaged or removed maxillary first molars. Knowledge of the various care methods and details on incidence in a particular condition is often essential for public policy officials to predict the expense of medical insurance.

CONCLUSION

In this study, we observed that a total of 358 patients had missing maxillary first molar. From a total of 358 patients, 95 patients (26.5 %) underwent replacement of the missing teeth, and 263 (73.46%) did not undergo replacement.

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