

PREVALENCE OF IMPACTED TEETH AMONG DENTAL PATIENTS - AN INSTITUTIONAL STUDY

Nurul Husniyah binti Che Soh¹, Santhosh Kumar M P², Arthi B³

¹Saveetha Dental College Saveetha Institute of Medical and Technical Sciences Saveetha University
Chennai-77

²Reader Department of Oral and Maxillofacial Surgery Saveetha Dental College Saveetha Institute of
Medical and Technical Sciences Saveetha University Chennai-77

³Senior Lecturer Department of Public Health Dentistry Saveetha Dental College Saveetha Institute of
Medical and Technical Sciences Saveetha University Chennai-77

¹151501090.sdc@saveetha.com

²santhoshkumar@saveetha.com

³arthib.sdc@saveetha.com

ABSTRACT

Dental impaction is a common problem presented by patients when seeking dental treatment. It can be described as a tooth that fails to erupt into the dental arch within an expected period of time, either partially or completely impacted. The reasons for impaction can be due to inadequate arch length and space available for eruption, excessive soft tissues or genetic abnormality. This study was conducted to evaluate the prevalence of impacted teeth among dental patients. This retrospective cross-sectional study was conducted using the patient records from a dental hospital from June 2019 until March 2020. Data regarding patients having impacted teeth were retrieved after analyzing 86000 case sheets. Radiographs and intraoral photographs were used to assess the patterns of impacted teeth. 785 patients diagnosed with impacted teeth were selected and evaluated for its prevalence based on age and gender. Excel tabulation and SPSS version 23 was used for data analysis. The statistical tests used for the demographics was frequency, percentage and for tests of association between categorical variables was Chi-square test. P value less than 0.05 was considered as statistically significant. Impacted teeth were predominantly present in males (57.5%) than in females (42.6%) among the dental patients. Mandibular left third molars showed the highest frequency of occurrence (45.7%) followed by mandibular right third molars (39.2%). Impacted teeth were predominantly present in the age group of 21-30 years (54.14%) followed by the age group of 31-40 years (23.69%) among the dental patients. Association between age and impacted third molars was statistically significant. [p value=0.003(<0.05)]. However the association between gender and impacted third molars was statistically not significant. [p value=0.136(>0.05)]. Within the limits of this study, it can be concluded that impacted teeth among dental patients were predominantly seen in the age group of 21-30 years with male predilection. Prevalence of mandibular third molar impactions was high with the left mandibular third molar being the most common impacted tooth in our study population.

Keywords

Canines, impacted teeth, third molars, panoramic radiograph, prevalence; dental patients

INTRODUCTION

Impacted teeth are defined as teeth that remain unerupted and retained that can be partially or completely erupted based on evaluation of clinical and radiographic examination (1). It is the tooth that is prevented to erupt into the oral cavity by overlying gum, bone or another tooth (2), (3). It also can be defined as ‘a tooth which fails to erupt into its anatomical position beyond its expected chronological time and is positioned

against another tooth or bone or soft tissue so that its further eruption is unlikely' (4). Failure of the permanent teeth to erupt normally is a commonly observed dental anomaly (5) and usually encountered regardless of genders and ages.

The tooth eruption is regarded as a complex event which is genetically based. The eruptive movement of the tooth germ occurs at estimated period and route, therefore allowing the tooth opponent at predetermined occlusal level (6). Many problems may be associated with these impacted teeth such as tooth movement, aesthetics as well as functional consequences. A tooth successfully erupts into the oral cavity in synchrony with forward and lateral growth of both the jaw bones, that recompenses the size difference of the teeth in the bones (7). Various complications that include tooth retardation and eruption failure may occur due to complexity of eruption (5). The complications should be terminated as early as possible to avoid any problems.

Tooth impaction is caused by several systemic and local factors (8) (9). Local causes are inadequate space, retained deciduous teeth, premature loss of deciduous teeth, obstruction of eruption path, infection and trauma, abnormality of jaw and cyst tumour and supernumerary teeth (10). Systemic factors include prenatal causes (11) such as heredity, postnatal such as anemia, congenital syphilis, malnutrition and endocrine dysfunction and rare conditions such as cleidocranial dysostosis, cleft palate etc.

Impacted teeth can be classified based on level and angulation (12). The classification of impacted third molars that are mostly accepted are by Pell & Gregory 1933 and Winter 1926 and impacted canine by Archer. Based on angulations it can be classified as mesioangular, distoangular, horizontal, vertical and buccolingual and based on level. It is also classified according to the occlusal height and amount of distal bone that are covering the distal region of tooth (13), (14).

Complications that may arise due to impaction are caries, periapical lesions, periodontal disease, temporomandibular joint disorder, root resorption of adjacent teeth and oral cysts and tumours (15), (16). The assessment of impacted teeth can be evaluated through panoramic radiograph and computed tomography for accurate localization for diagnosis and treatment of impacted teeth (17). Radiograph is considered as one of the effective ways to assess the teeth impaction, either intraoral radiograph as well as panoramic radiograph clinically.

Impacted teeth can be diagnosed based on clinical as well as radiographic examination. Clinically, partially impacted teeth can be determined based on the appearance of the tooth erupting incompletely, showing only the cusps or some parts of the tooth erupted into the oral cavity (18). Intraoral and panoramic radiographs usually used to assess the tooth impaction which helps to evaluate the pattern of impaction and aids in accurate treatment planning (19).

Surgical removal of impacted teeth is decided based on clinical and radiographic (20) diagnosis that reveal whether the tooth will erupt or not, either the space available in the dental arch is adequate for the eruption and also if any pathological and neoplastic processes are associated with it (5). The aim of present study was to evaluate the prevalence of teeth impaction among dental patients in the Chennai population.

MATERIALS AND METHODS

Study design and study setting

This retrospective study was conducted in Saveetha Dental College and Hospital, Saveetha university, Chennai, to evaluate the prevalence of impacted teeth among dental patients reporting from June 2019 to March 2020. This study has been approved by the University hospital research committee with ethical approval number SDC/SIHEC/2020/DIASDATA/0619-0320.

Study population and sampling

Inclusion criteria for the study were patients at least 18 years of age, with complete root formation of third molars, and no history of third molar extraction. Patients with dental pathologies, malalignment in the occlusal plane and presence of congenital diseases or facial syndromes, absence of third molars were excluded from this study. The pros of the study were large samples, less time consumption for data collection as it was an automated process. The cons of the present study would be researcher bias. After assessing 86,000 patient records in the university patient data registry, a total of 785 patients who were diagnosed with impacted teeth and were eligible for the study were included in the study. Cross verification of data for errors was done with the help of an external examiner.

Data collection

Data regarding patients having impacted teeth were retrieved after analyzing 86000 case sheets. Radiographs and clinical intraoral photographs of patients having impaction were reviewed. The following criteria were examined based on the dental records: Demographic details like age and sex, social and family history. All the radiographs collected were assessed for the following parameter: number of the impacted teeth in all the quadrants of the jaws. Impacted mandibular and maxillary third molars were assessed and classified based on winter's classification and Pell and Gregory classification. All the data collected were tabulated in MS Excel and incomplete data was eliminated.

Statistical Analysis

The collected data was validated, tabulated and analysed with Statistical Package for Social Sciences for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables. P value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

This study included 785 patients who were diagnosed with impacted teeth and the case records were reviewed. The aim of the study was to record the prevalence of impacted teeth among dental patients attending a dental hospital. The data were enumerated through the analysis of the data records at a dental hospital. An unerupted tooth is considered a clinical challenge not only for normal function of mastication but also for the orthodontist in terms of diagnosis, anchorage management and duration of treatment. As impacted teeth may create unwanted dental problems, removal of impacted teeth may be taken into consideration.

In our study, impacted teeth were predominantly present in males (57.5%) than in females (42.6%) among the dental patients. [Figure 1]. According to our study, mandibular left third molars showed the highest frequency (45.7%) followed by mandibular right third molars (39.2%), maxillary right third molars (5.2%) and maxillary left third molars (4.7%). Other impacted teeth showed lower incidence of impaction with 12 (0.1%), 13 (1%), 15 (0.1%), 17 (0.1%), 23 (1.1%), 27 (0.1%), 33 (0.3%), 35 (0.3%), 36 (0.1%), 37 (0.4%), 43 (0.5%), 44 (0.3%), 45 (0.3%), 46 (0.1%) and 47 (0.1%). Among the impacted teeth, (38) the left impacted mandibular third molar (45.7%) was predominantly present followed by (48) the right impacted mandibular third molar (39.2%) among the dental patients.[Figure 2].

Impacted teeth were predominantly present in the age group of 21-30 years (54.14%) followed by the age group of 31-40 years (23.69%) among the dental patients. Other age groups presented lower incidences with 11-20 years (12.5%), 31-40 years (23.7%), 41-50 years (7.3%), 51-60 years (2%) and 61-70 years (0.4%). [Figure 3]. Impacted third molars were predominantly present among dental patients in the age group of 21-30 years and the results were statistically significant. [p value=0.003(<0.05)]. [Figure 4].

Impacted third molars were predominantly present among dental patients in males than in females. However the results were statistically not significant. [p value=0.136(>0.05)]. [Figure 5].

In our study there was a significant difference in the prevalence of teeth impaction between male and female patients. In the context of our investigation, we found that impacted teeth were more prevalent in males than females with the incidence of teeth impaction mostly contributed by impacted third molars. Although there was no statistically significant association in the sex distribution for impacted molars in our study, the male to female prevalence rate ratio was 1:1.3. Our study was in accordance with Patil et al. 2014 (21) who reported slightly higher prevalence in males than females, with no significant difference observed. Female patients showed higher prevalence as reported by Singh et al. 2016 (22). This study was supported by Ishwarkumar et al. 2019 where females presented with higher frequency of impacted teeth compared to males (23).

It was observed in our study that mandibular third molars were most likely affected teeth in comparison to other dentitions. Our findings were similar to Singh et al. 2016, where mandibular right third molars were most commonly encountered followed by mandibular left third molars incidence (22). Impacted canines were found as most commonly impacted teeth as reported by Fardi et al. 2011, followed by impacted molars (5). A similar study by Patil et al. 2014 showed canine impaction as the highest teeth impacted followed by premolars impaction (21). Wisdom teeth are believed to be the most often teeth impacted. This is due to the reason that as the time they erupt, the jaw has often stopped growing, thus may unable to provide adequate space or being too small to accommodate the teeth (24). Usually, the third molars are removed if they become a problem in addition to no real need for wisdom teeth anymore. If an individual is likely to have a small jaw, impaction of wisdom teeth is likely to occur (25), (26).

In our study impacted teeth were more prevalent in the age group of 21-30 years (54.1%). There was a sudden increase in prevalence of impacted teeth as age increased and reached the highest among 24 years patients (7%). Prevalence of impacted teeth gradually decreased as age increased. The least incidence of teeth impaction reported in our study were patients of 50 years and above, with less than 1%.

According to our study, a higher number of impacted teeth were present in the younger age group of 21-30 years. Based on study by Rosza et al. 2003 (27), 11-18 years age group who presented for orthodontic treatment, about 5.43% of them revealed impacted canine. In another study, 22-26 age group individuals recorded the highest count with teeth impaction as observed by Singh et al. 2016. In a similar study, the majority in the age group of 20-25 years presented with third molar impactions as reported by Ishwarkumar et al. 2019 (23).

As reported by few studies done regarding impacted premolars, it has been concluded from the results of these studies that impaction of premolar is rare with the percentage rate of less than 3% (21), (27) The present study was in line with the reported studies as highest frequency involving premolars were less than 5%. Teeth impaction may cause multiple complications, including abscess in relation to the tooth or gums, malocclusion, recurrent infection of the impacted tooth, chronic discomfort in the mouth and advanced plaque and debris accumulation as well as the food lodgement between the tooth and soft tissues that can lead to pericoronitis (28), (29)

The present study has several limitations. Demographic features, small sample size, as well as unequal distribution of participants among genders can lead to bias in study. Racial and genetic differences as well may contribute to dissimilarities to previous studies, which has to be taken into consideration.

CONCLUSION

Within the limits of this study, it can be concluded that impacted teeth among dental patients were predominantly seen in the age group of 21-30 years with male predilection. Prevalence of mandibular third molar impactions was high with the left mandibular third molar being the commonly present impacted tooth in our study population.

AUTHOR CONTRIBUTION

All authors have equal contribution in bringing out this research work

ACKNOWLEDGEMENT

Nil

CONFLICT OF INTEREST

Nil

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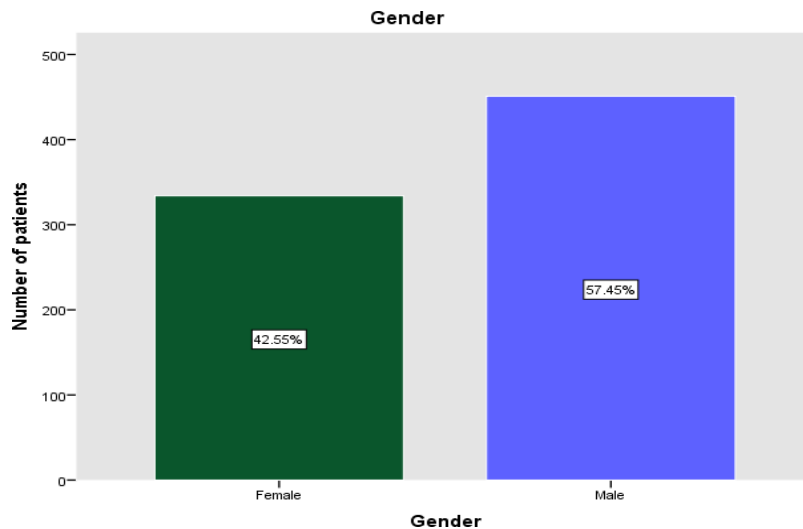


Figure 1. Bar graph shows gender wise distribution of impacted teeth among dental patients. X axis represents the genders and Y axis represents the number of patients with impacted teeth. Impacted teeth were predominantly present in males (blue, 57.5%) than in females (green, 42.6%) among the dental patients.

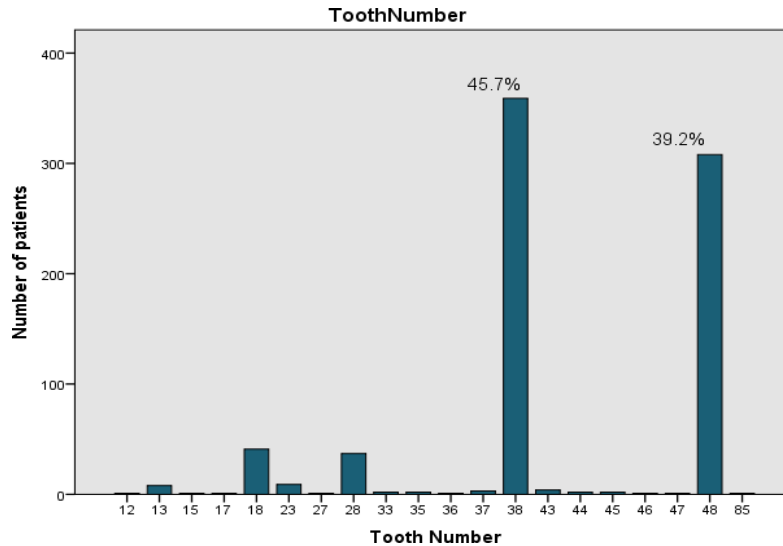


Figure 2. Bar chart shows tooth wise distribution of impacted teeth among dental patients. The X axis shows various tooth numbers. Y axis represents the number of patients with impacted teeth. 38 (45.7%) was predominantly present followed by 48 (39.2%) among the dental patients.

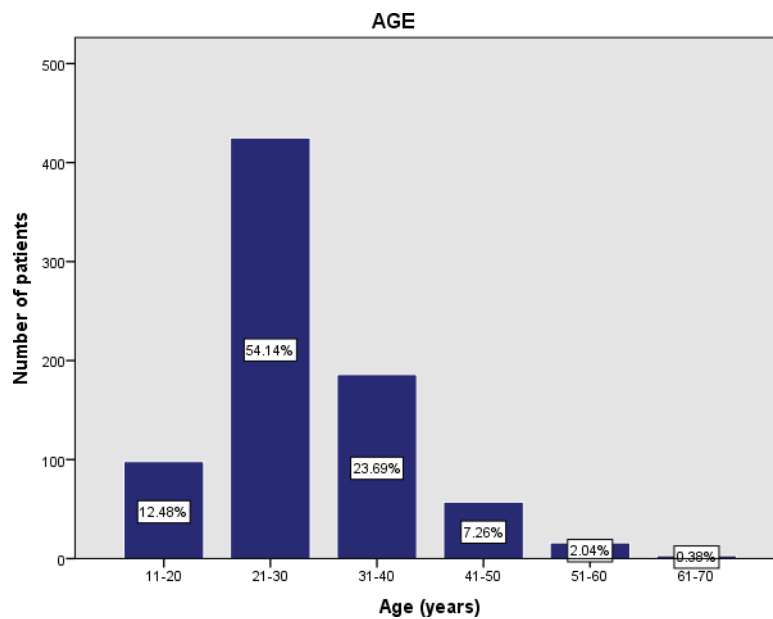


Figure 3. Bar chart shows age wise distribution of impacted teeth among dental patients. X axis represents age and Y axis represents the number of patients with impacted teeth in each age group. Impacted teeth were predominantly present in the age group of 21-30 years (54.14%) followed by the age group of 31-40 years (23.69%) among the dental patients.

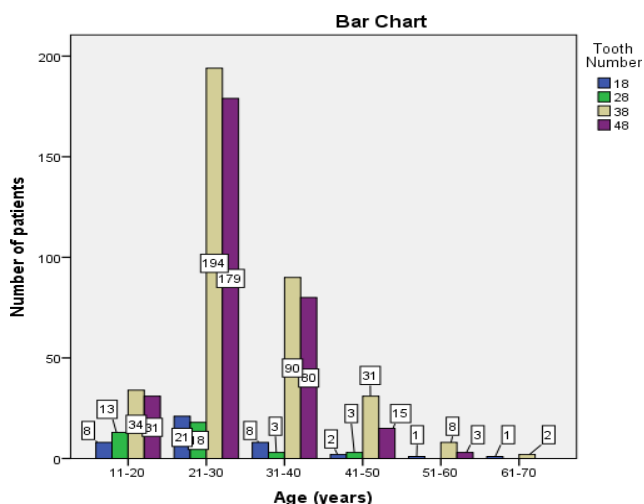


Figure 4. Bar graph showing the association between age and impacted third molars. X axis represents the age groups and Y axis represents the number of patients with impacted third molars. Impacted third molars 38 (brown) and 48 (violet) were predominantly present among dental patients in the age group of 21-30 years and the results were statistically significant. [Pearson's chi square value - 39.774; DF - 15; p value=0.003(<0.05)].

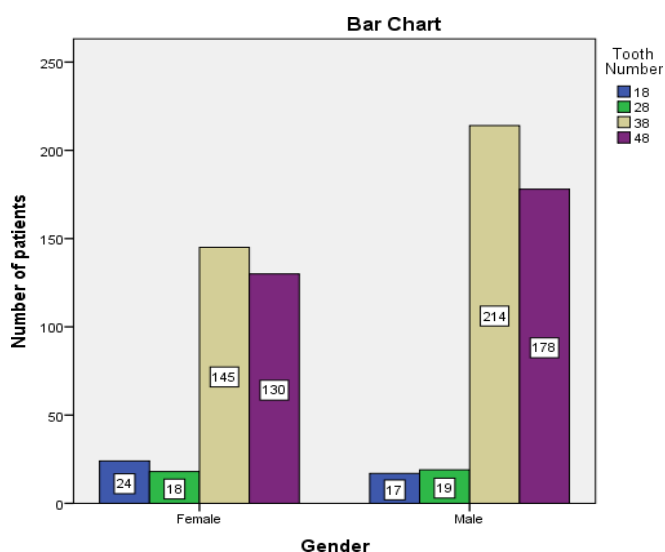


Figure 5. Bar graph showing the association between gender and impacted third molars. X axis represents gender and Y axis represents the number of patients with impacted third molars. Impacted third molars 38 (brown) and 48 (violet) were predominantly present among dental patients in males than in females. However the results were statistically not significant. [Pearson's chi square value - 5.549; DF - 3; p value=0.136(>0.05)].