

Assessment of Prevalence And Gender Predilection Of Canine Impaction In Chennai Population

Research Article

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Abstract

Tooth impaction is a pathological situation in which a tooth cannot or will not erupt into its normal functioning position. The permanent canines are the foundation and pillar of an aesthetic smile and functional occlusion. Although most impacted teeth are asymptomatic, some can cause complications such as pain, infection cysts, tumors, resorption of the adjacent teeth, jaw fractures, malpositioning of the mandibular anterior teeth and marginal bone resorption near the adjacent teeth. Hence, it is important to see the prevalence of canine impaction in the selected population so that awareness can be created among the public to report to a dentist as early as possible. The aim of this study was to assess the prevalence of canine impaction in the Chennai population. A retrospective cross sectional study was conducted using the case records of patients who visited the outpatient department in Saveetha Dental College from June 2019 to March 2020. The selection was done by non probability sampling. Data was collected and then subjected to statistical analysis. 2069 patients who fulfilled the inclusion criteria were included in the study. Microsoft excel 2016 (Microsoft Office 10) data spreadsheet was used and later exported to the statistical package for social science for windows (version 20.0 SPSS, Chicago III USA). The data was analysed through chi square. Out of 2069 patients, 5.12% reported with canine impaction. Gender predilection shows that the canine impaction was slightly more prevalent in males (2.95%) than in females (2.17%) ($p < 0.05$) and maxillary canines being most commonly impacted (73.5%). Within the limitations of this study, it was concluded that canine impaction is moderately prevalent in the Chennai population. The findings of the current study can be used to create awareness among common people and dentists so that canine impacted cases can be reported at an early age and treated without any complications.

Keywords: Canine; Eruption; Impaction; Prevalence.

Introduction

The different types of canine anomalies like ectopic canine eruption, canine transmigration, canine transposition, agenesis, impaction, usually occur due to the disturbances during development and eruption. Since the canines are the longest in the oral cavity and the shape, position of the canines contribute to the guidance of the teeth into the intercuspal position, the canine teeth should be evaluated thoroughly in order to deliver the best treatment to the patients.

Impacted teeth are those with a delayed time of eruption or that are partially erupted [1-3]. The eruption of permanent maxillary

canine represents a complex series of events and is mostly genetically based [4-6]. Failure of the eruption of permanent maxillary canine is a common dental problem. Problems such as compromised tooth movement, esthetics and functional outcome are posed by impacted teeth [7-9].

Although most of the impacted teeth are asymptomatic, some can cause complications such as pain, infection cysts, tumors, resorption of adjacent teeth, jaw fractures, malpositioning of anterior teeth and marginal bone resorption near adjacent teeth [10-12]. A complex synchronised forward and lateral growth of maxillary bone contributes to a successful development of maxillary permanent canine.

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As the eruption process is complex, it is inevitable that problems may arise, leading to complications including tooth retardation or failure of eruption. Diagnosis of canine impaction can be done based on clinical and radiographic findings. Kettle recommended that palpation of the buccal surface of the alveolar process just distal to the lateral incisor may be helpful in the diagnosis of canine impaction [12]. A bulge will indicate the presence of a normally developing canine. A panoramic radiography is of great clinical significance, to establish the correct surgical procedure [11]. In addition to analytics studies, our team has been working on various comparative studies [13-15]; and also recent advancements [16-19] that are being considered as a breakthrough in orthodontics. Various reviews [20-23] and clinical trials [24-26] also have been conducted in order to create new views and effective treatment options in future. The aim of the present study is to determine the prevalence and gender predilection of impacted canines in the Chennai population.

Materials and Methods

Study setting

This study is a university setting. Study conducted in Saveetha dental College., predominantly. Patients who reported to Saveetha Dental College, Chennai were included for the study. Approval was obtained from the institutional ethical committee [IEC]. Ethical approval number- SDC/SIHEC/2020/DIASDATA/0619-0320. Two examiners were involved in the study.

Sampling

The study is a retrospective study. Data was collected from June 1, 2019 to March 31, 2020. Totally 2069 casesheets were reviewed. The study population included patients who reported to the outpatient department for dental treatment needs. Cross verification of data for error was done by the presence of an additional reviewer. Simple random sampling was done to minimise the sampling bias.

Data collection

Data of 2069 patients undergoing dental treatment was taken from the hospital database. Repeated or incomplete patient records were excluded. All the 2069 patient records were selected and reviewed. Each patient's case history was reviewed for any ca-

nine impaction. Also their OPG(if any) and clinical photographs were obtained and studied. Data verification was done based on the age, gender, presence of canine impaction. Data was entered in the excel sheet in a methodical manner and was imported to SPSS. Incomplete or uncensored data was excluded from the study.

Analytics

Data was recorded in Microsoft excel 2016 and then exported to IBM SPSS 2.0 Software for data analysis. Independent variables include - age, gender and dependent variables include presence of canine impaction, arch. Descriptive and inferential statistics was used. Inferential test includes the chi-square test which was employed with a level of significance set at $p < 0.05$.

Results and Discussion

Out of 2069 patients, 5.1% reported with canine impaction [figure 1]. Gender predilection shows that the canine impaction was slightly more prevalent in males (2.95%) than in females (2.17%) ($p < 0.05$) [figure 2]. In regard to association of canine impaction with arch shows that canine impaction was most prevalent in upper arch (3.77%; $n=80$) followed by canine impaction in lower arch (1.11%; $n=23$) and least occurrence of canine impaction in both arches at the same time (0.24%; $n=5$) [figure 3] where $p > 0.05$ is not statistically significant.

The data for this retrospective study was based on residents of Chennai who reported to Saveetha Dental Hospital for treatment of impacted canine. Currently there are no existing studies investigating the prevalence of canine impaction in Chennai. Since all the data available was included without a sorting process, no bias was accepted in selection of patients. Knowledge of dental anomalies in patients is fundamental for treatment planning [27]. According to Stecker et al. [28], dental practitioners who are aware of ethnic differences in the occurrence of dental anomalies will be more aware in finding them in patients during routine examinations, and may be predictive of normal patterns of tooth development and/or eruption, allowing for prompt clinical intervention to avoid complicating pathology. The Canine impaction is one of the anomalies that should be considered by clinicians in detail. Hence, this study was conducted in order to create awareness on the severity of canine impaction among the public, so that they can report to a dentist at an early stage for treatment of

Figure 1. Barchart represents prevalence of canine impaction. X-axis represents all patients and Y-axis represents prevalence of canine impaction(%). Blue bar depicts no canine impaction and green bar depicts presence of canine impaction. The prevalence canine impaction in 5.1%(n=106).

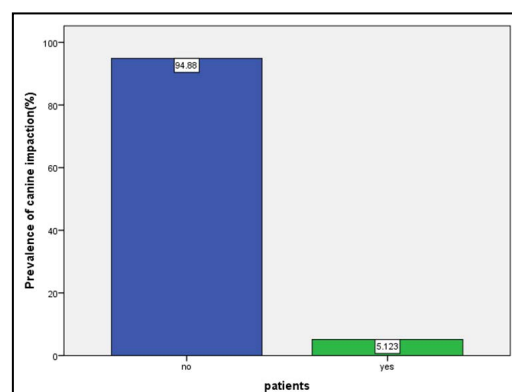


Figure 2. Barchart represents the association between gender and presence of canine impaction . X-axis represents gender and Y-axis represents total number of population. Blue bar represents no canine impaction and green bar represents presence of canine impaction. The canine impaction was more prevalent in males than in females. chi-square test, p value= 0.03<0.05 is statistically significant.

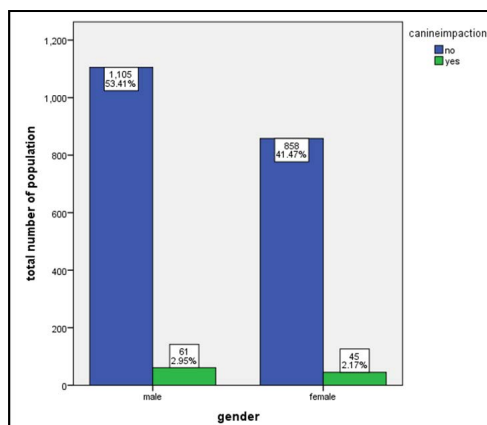
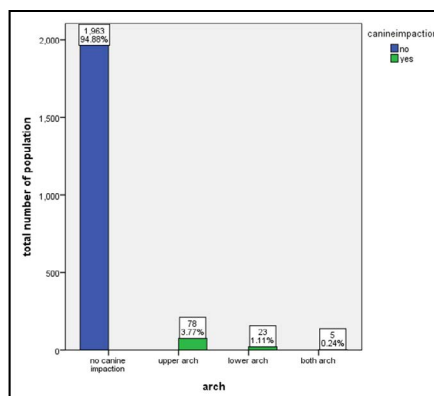


Figure 3. Barchart represents the association between arch and presence of canine impaction. X-axis represents arch and Y-axis represents the total number of population. Blue bar represents no canine impaction and green bar represents presence of canine impaction. The canine impaction was prevalent in upper arch followed by canine impaction in lower arch and least occurrence of canine impaction in both arches at the same time. However, there is no statistically significant difference. chi-square test, p value= 0.9>0.05 not significant



impacted canines; as well as among dentists for better diagnosis. This study helps a dentist to understand the severity of impacted canines in Chennai.

Although the investigated subjects may not represent the whole Chennai population, there was no significant variation in the prevalence and distribution of impacted canines. Comparison of the results of the present study with various populations was done. From the analysis, it was seen that 5.1% of canine impaction was prevalent in this study. This finding is close to a study done in the Puerto rican population [29] where prevalence of canine impaction was 3.2% and two other studies done in Riyadh which showed prevalence of 3.41% [30] and 3.37% [31] respectively. However, the prevalence found in this study, was relatively low when compared to the prevalence of impacted canines reported in other populations such as the 8.8% rate reported in Greek population1 and 6.04% rate in Mexican population [32]. The Japanese have shown to have the lowest frequency as reported in the literature, where the anomaly occurred in only 0.27% of the study population. Similar to these findings, study of a large series of full mouth dental radiographs in the USA revealed a figure of 0.92% [33]. While Brinet al.[34] in their study of an Israeli population, found a level of 1.5%. The different results from these studies may arise from racial differences and differences in the methodology of the study.

Taking into account the source of the analyzed data, which were derived from our Department, the large age range of the examined sample and the limited exclusion criteria, one might consider that the results of this study are not representative of the general population. However, the primary aim of this study was to investigate the frequency of impacted teeth in patients who attend our Department. A study done by SanthoshPatil et al.[35] had examined the patient from 8years to 72 years of age. The present study examined the similar range of age group from 18-50 years. In the present study, the maximum number of patients with impacted canines reported at the age 18-30 years when compared to the age group 31-50 years. Hence it was understood that 18-30 years age group were more aware of impacted canines and immediately reported to a dentist whereas the other age groups 31-50 years and showed that they were not much aware of canine impactions and reported much late to the dental clinic for treatment of impacted canines.

In association of canine impaction with arch, the present study reported that maximum number of patients reported with canine impactions in upper arch(3.77%; n=80) followed by canine impaction lower arch(1.11%; n=23) and least number of patients reported with canine impactions in both arches at the same time(0.24%; n=5). This finding correlates with Roher [36] where

it was observed that impacted canines were 20 times more frequent in the maxilla than in the mandible. The rarity of impacted canines in the mandible was confirmed in this study. Indeed, most of the impacted canines were located in the maxilla, which had also been established as the predominant location by others [37]. Impacted canines of the mandible, of which there were only six cases in our study, are very rare in the general population. Grover and Lorton examined 5,000 radiographs and found 142 examples of impacted canines in the maxilla (2.84%) and only 11 in the mandible (0.22%) [38]. In one study that included 1,000 Turkish patients, the incidence of maxillary canine impaction was 2.9%, while the incidence of impacted mandibular canines was 0.3% [39]. In another study, Shah et al., detected only eight impacted canines in the mandible among 7,886 patients (0.10%) [40].

In a Chinese population [39], the prevalence of canine impaction was high in the lower arch. However, this differs from the findings of the present study as high prevalence was seen in upper arch (2.67%).

The significance obtained from the statistical tests done to observe the relationship between impaction and gender shows that canine impaction is more prevalent in males than females in the present study. This finding does not correlate with Jacobs [40] who states that prevalence of canine impaction is higher in females than male. Most of the studies report that there is no difference between impacted canines and gender [35].

This study has certain limitations that may have affected the results. For example, the data collection period could have been longer, different population could have been taken for comparison. The sample size was small and the sample population was only representative of the patient pool at Saveetha Dental College and hospitals. Wider population groups should be studied in Chennai. However, some authors still believe that the prevalence rates of canine impaction may reflect the prevalence rates of these anomalies in the general population.

The current research shows that despite its drawbacks, canine impaction is moderately prevalent in the Chennai population. This suggests the need to spread awareness on diagnosis and treatment modalities of exposure of impacted canines among dentists and public.

Conclusion

The prevalence of canine impaction is moderate in the Chennai population (4.32%). The present study findings have shown that the 18-30 years age group was aware of impacted canines when compared to older age groups and prevalence of canine impaction was prevalent in males than in females. The eruption of canine plays a vital role in facial appearance, dental aesthetics, arch development and functional occlusion. Thus, the early diagnosis of canine impaction at an early stage is crucial to carry out a proper and successful orthodontic treatment.

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