

PREVALENCE OF IMPACTED MAXILLARY CANINES IN PATIENTS REPORTING TO A DENTAL HOSPITAL-A RETROSPECTIVE STUDY

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Abstract

A tooth is considered impacted when its eruption is hampered by other teeth, bone, or soft tissues. Diagnosis is generally based on clinical and radiological analyses. It can affect the patient's self confidence and alter the functions. This study is important to plan intervention programs and highlight the importance of early orthodontic screening. The aim of the study is to determine the prevalence of impacted canine in patients reporting to saveetha dental college. A total of 86,000 records of patients were reviewed. Data was collected and a retrospective study was done. Overall case sheets were reviewed which were dated between June 2019 to March 2020. Retrospective data of patients who visited the Department of Orthodontics was analysed. 14 patients who fulfilled the inclusion and exclusion criteria were included. The data was collected in excel sheets by the patient records of saveetha dental college and hospital and subjected study was performed followed by data analysis using SPSS and the variables were defined. It was observed that the impaction of maxillary canine was predominant in male patients when compared to that of female patients (Pearson's Chi square value = 1.167; df = 1; p-value: 0.280 ($p > 0.05$); hence statistically not significant) in the age group of 11-20 years (Pearson's Chi square value = 0.729; df = 2; p-value: 0.694 ($p > 0.05$); hence statistically not significant) and it was most commonly found in the second Quadrant.

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INTRODUCTION:

A tooth is considered impacted when its eruption is hampered due to various factors such as by other teeth, bone, or soft tissues, impacted teeth can be clinically observed and later confirmed by radiographic methods. (Pedreira *et al.*, 2016) (Sajnani and King, 2014; Pedreira *et al.*, 2016). The incidence of impacted teeth, excluding third molars, has been reported to vary between 5.6 to 18.8% (Thilander and Jakobsson, 1968). Permanent maxillary canines are the second most frequently impacted teeth; the prevalence of their impaction is 1 - 2% in the general population. The incidence of canine impaction in the maxilla is more than twice that in the mandible. Of all patients who have impacted maxillary canines, 8% have bilateral impactions (Bishara and Ortho., 1992). Canines are considered to be the cornerstones of the mouth, they have very essential functions; as they aid in tearing food. Dental anomalies are relatively common changes, often influenced by genetic, epigenetic and environmental factors, in dental development (Manne *et al.*, 2012).

Early diagnosis and intervention could save the time, expense, and more complex treatment in the permanent dentition. Tooth impaction can be defined as the infraosseous position of the tooth after the expected time of eruption, whereas the anomalous infraosseous position of the canine before the expected time of eruption can be defined as a displacement. Most of the time, palatal displacement of the maxillary canine results in impaction. (Power and Short, 1993) When diagnosed at an early age, the infant canine is extracted as a recommended preventative measure. The increased incidence of impaction in canine teeth is mainly attributed to their high developmental position in the maxilla and long, complicated path of eruption to the occlusal plane. (Ericson and Kurol, 1987) Our team has extensive knowledge and research experience that has translate into high quality publications (Kamisetty *et al.*, 2015; Patturaja and Pradeep, 2016; Felicita, 2017; Jain, 2017; Kumar, 2017) (Neelakantan *et al.*, 2011; Jain, Kumar and Manjula, 2014; Kamisetty *et al.*, 2015; Varghese *et al.*, 2015; Azeem and Sureshbabu, 2018)

Now the growing trend in this area motivated us to pursue this project.

MATERIALS AND METHODS:

Study design and setting:

The study was conducted after ethical approval was obtained from the institutional review board. (SDC/SIHEC/2020/DIASDATA/0619-0320.) A retrospective study was conducted to evaluate prevalence of impacted maxillary canines in patients who visited Saveetha dental College. The study population included all patients with impacted maxillary canine. The advantage of this study was the flexible data that could be obtained easily and economically. However the drawback of this study is that there were geographic limitations and the people involved in the study were from an isolated population and belonged to the same ethnic group.

Data collection

The inclusion criteria was all patients who reported with impacted maxillary canine. The exclusion criteria was any incomplete data that wasn't recorded properly. The patient records were reviewed and analysed between June 2019 and March 2020. All available data was included in the study to minimise sampling bias. Patients of all age groups were involved in the study. Collected data was cross verified using photos and case sheets. Data collected was then tabulated. The patient records were reviewed by checking of intra oral photos and data of the patients. Inclusion criteria consisted of all patients with impacted maxillary canine. Patients those with systemic diseases were excluded from the study. All data was collected and tabulated methodically using MS Excel.

Statistical Analysis

After tabulation using MS Excel, the data was exported to IBM SPSS software [Version 19: IBM Corporation NY USA] for statistical analysis. Descriptive statistics was done to assess the prevalence of impacted maxillary canine. Pearson chi square test was done to statistically analyze the data. Pearson chi square test was used to identify any significant level of variation of association; the significance level was set at 0.05.

RESULTS AND DISCUSSION:

Out of the total 14 patients involved in the study it was observed that the highest number of impacted maxillary canine was more predominant in the 1st quadrant (n=8;57.1%) when compared to the 2nd quadrant (n=6;42.9%) [Figure 1] Impaction of maxillary canine was predominant in both the quadrants in patients between 11-20 years of age. (Quadrant 1; n=4;50%) (Quadrant 2; n=4;66.7%) (Pearson's Chi square value=0.729; df=2; p-value: 0.694 (p>0.05); hence statistically not significant.) [Figure 2] Impaction of maxillary canine was predominant in both the genders, quadrant 1 (n=5;62.5%) in relation to females and quadrant 2 (n=4;66.7%) in relation to males. (Pearson's Chi square value = 1.167; df =1; p-value: 0.280 (p>0.05); hence statistically not significant.) [Figure 3] Chi square test was done and association between age group, gender and quadrant with that of Impaction of maxillary canine was found to be statistically not significant (P>0.05).

The mechanism of normal eruption and normal alignment of the maxillary anterior teeth was first described over 70 years ago (Kaplan and Goidl, 1975)

Radiographic examination of ectopically erupting maxillary canines in 35 children age group of 10–13 years old by Ericson and Kurol suggested 78 percent success in terms of rate and time (6–12 months) of spontaneous eruption of permanent canines after the extraction of primary ones. (Ericson and Kurol, 1987) Maxillary expansion protocol as another treatment option in early mixed dentition period was suggested by Baccetti *et al.* (Ericson and Kurol, 1987; Baccetti *et al.*, 2009) A few studies have quoted the female:male ratio variously as 2:1, 4:1 and 10:1. (Ericson and Kurol, 1988) (Ericson and Kurol, 1988; Rimes, Mitchell and Willmot, 1997)

Pain is the most frequently reported complication associated with the occurrence of impacted maxillary canines, prior to surgery. An orthodontic eyelet with a gold chain is then bonded to the crown of the impacted tooth. Use of a good bonding technique will minimize chances of bond failure necessitating a second surgical procedure. Atraumatic surgical procedure will allow minimal postoperative complications and a rapid recovery. (Celikoglu, Miloglu and Oztek, 2010)

With early detection, timely interception and well-managed surgical and orthodontic treatment, impacted maxillary canines can be allowed to erupt and be guided to an appropriate location in the dental arch. However, it is only with interdisciplinary care of general dentists and specialists that impacted maxillary canines can be treated successfully. Our institution is passionate about high quality evidence based research and has excelled in various fields

(Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Mathew *et al.*, 2020). We hope this study adds to this rich legacy.

CONCLUSION:

Within the limitation of the study it can be concluded that the prevalence of impacted maxillary canine is predominant in the age group of 11-20 years. The association between age, gender and the involved quadrants in patients with impacted maxillary canine was not significant. Hypodontia was more common in males and in the first Quadrant.

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CONFLICT OF INTEREST: There is no conflict of interest.

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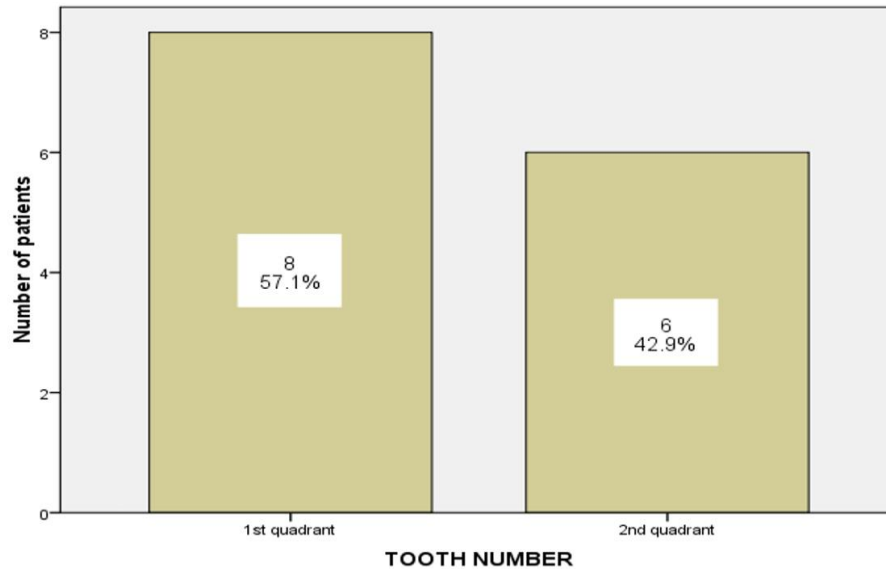


Figure 1: Bar graph depicts the frequency distribution of impacted maxillary canine between the two Quadrants(Quadrant 1, Quadrant 2). It was observed that the impacted maxillary canine was more predominant in the 1st quadrant when compared to the 2nd quadrant.

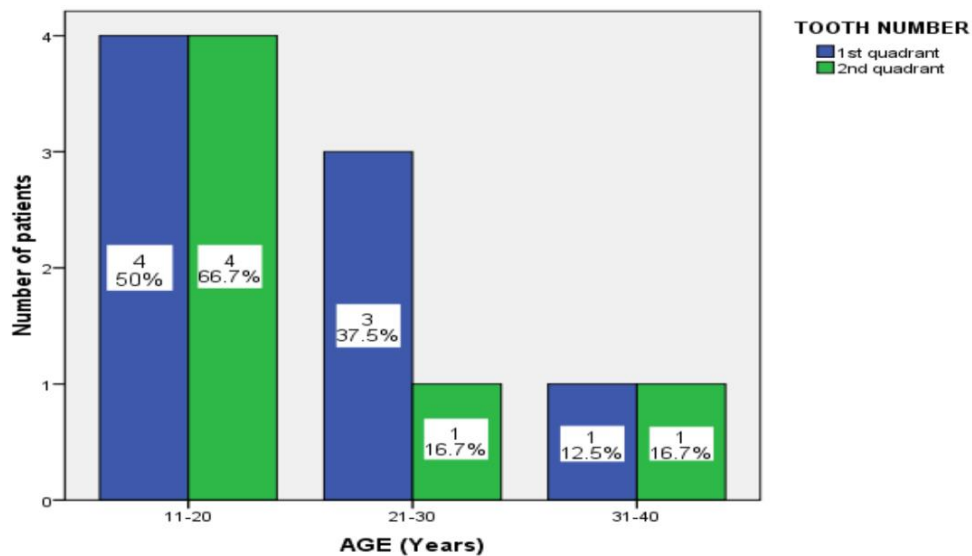


Figure 2: Bar chart depicts the association between the age group and impacted maxillary canine . The X axis depicts the age group and the Y axis represents the number of patients with impacted maxillary canine . Inference: Impaction of maxillary canine was predominant in both the quadrants (Quadrant 1-blue)(Quadrant 2- Green) in patients between

11-20 years of age. Pearson's Chi square value=0.729; df=2; p-value: 0.694 (p>0.05); hence statistically not significant.

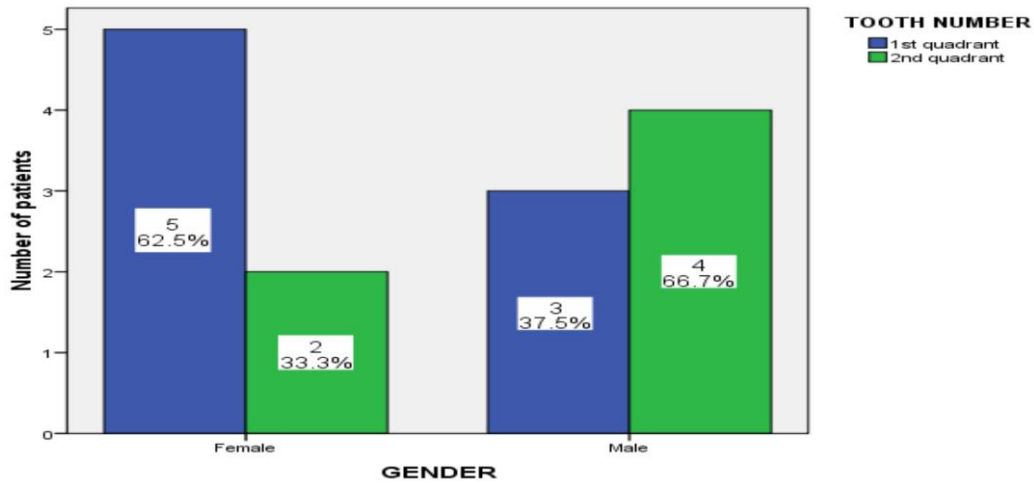


Figure 3: Bar chart depicts the association between gender and impaction of maxillary canine. The X axis depicts gender and the Y axis represents the number of patients with impacted maxillary canine . Inference: Impaction of maxillary canine was predominant in both the genders, quadrant 1(Blue) in relation to females and quadrant 2(Green) in relation to males.Pearson's Chi square value = 1.167; df =1; p-value: 0.280 (p>0.05); hence statistically not significant.