

Prevalence of peg lateral among dental outpatients

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Abstract

A peg lateral is defined as the mesiodistal width shorter than cervical width of the tooth crown which is frequently seen in permanent maxillary lateral incisors. Peg shaped lateral incisors are considered as the reduced form of hypodontia trait. Over many years, literature has suggested that occurrence of peg laterals is associated with the same genetic mutation that causes agenesis of maxillary lateral incisors. Since lateral incisors being the anterior teeth pose a major role in aesthetics of the person's smile. This study aims to evaluate the prevalence and gender distribution of peg lateral among the patients visiting saveetha dental college and hospitals . A retrospective cross sectional study was conducted using the case records of patients who visited the aesthetics department in Saveetha Dental College and hospitals from June 2019 to March 2020. The selection was done by non probability sampling. Data was collected and then subjected to statistical analysis. 2,387 patients who reported to the esthetic department for esthetic correction of the anteriors 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 2,387 patients, 2.38% reported with peg laterals. Gender predilection shows that the peg laterals were slightly more prevalent in males (1.26%) than in females (1.13%) ($p > 0.05$) and bilateral prevalence was most commonly present (1.51%). Within the limitations of this study, it was concluded that peg lateral is moderately prevalent among the Chennai population. The findings of the current study can be used to create awareness among common people and dentists so that peg lateral cases can be reported at an early age and treated for a better aesthetic look.

Key words: hypodontia; peg lateral; dental anomalies.

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1. INTRODUCTION

A peg lateral is defined as the incisal mesiodistal width shorter than cervical width of the tooth crown which is frequently seen in permanent maxillary lateral incisors (Menezes and Basker, 1976). It is also defined as under developed, tapered incisors and are the commonest form of microdontia (Academy of Prosthodontics, 1994; Purayil and Acharya, 2015). The peg lateral is one of the common dental anomalies that every dental practitioner might have come across during the clinical examination. Stanley et al, have stated that maxillary lateral incisors vary more than any other tooth in mouth, except the third molars (Ash, 2003).

Peg shaped lateral incisors are considered as the reduced form of hypodontia trait (Stamatiou and Symons, 1991). Over many years, literature has suggested that occurrence of peg laterals is associated with the same genetic mutation that causes agenesis of maxillary lateral incisors (Alvesalo and Portin, 1969; Witkop, 1987).

Disturbances in morphodifferentiation may affect the form and size of the tooth without impairing the function of the tooth and the function of ameloblast odontoblasts, thus the result may be a peg shaped/malformed tooth with enamel and dentine that may be normal in structure (Abu-Hussein, Watted and Yehia, 2015). Brook proposed a multifactorial model based on an underlying continuous distribution of tooth size with thresholds determining hypodontia and supernumerary teeth and a general trend that, the more severe, the smaller the size of the tooth formed (Brook *et al.*, 2002; Babar, Amin and Asif, 2020).

Farhat et al, in his study have stated that, the average mesiodistal width of maxillary lateral incisors is 6.5 mm. They are usually 2 mm longer mesio distally and 2 mm shorter cervico incisally than that of canine and central incisors (AlRushaid *et al.*, 2016). Peg shaped lateral incisors are considered as the variable expression of the gene responsible for congenitally missing maxillary lateral incisors (Alvesalo and Portin, 1969; Arte *et al.*, 2001). Hypodontia,

congenitally missing teeth is more common in permanent than primary dentition. A study described the prevalence of peg shaped laterals in the maxilla to be 7.5% in Asians and 1.6% (Abu-Hussein, Watted and Azzaldeen, 2015) .

Hua et al, in their study have reported that occurrence of peg lateral rates were higher in Mongoloid (3.1%) than in black (1.5%) and white (1.3%) patients, and comparison between orthodontic patients (2.7%) than in the regular dental patients (1.9%) (Hua *et al.*, 2013). Amin et al, in their study have reported that peg shaped lateral incisors occur in approximately 2%–5% of the general population, and women show a slightly higher frequency than men (Amin, Asif and Akber, 2011). Usually they are found equally on the right and left, uni- or bilaterally, however some studies have shown their bilateral occurrence slightly higher than the unilateral occurrence.

When peg shaped laterals erupt in the mouth, esthetically it can be a disappointment to the patient that their teeth are not perfect or too small in comparison to the rest of the anterior teeth. So it is essential that the dentist should be aware about the patient's aesthetic perception and provide proper treatments based on their concern. The study is captivated in order to bring awareness among the general population and dentist regarding the importance of diagnosis of peg lateral as it can be a major apprehension among the young population due to its disfigured appearance compared to other teeth present in the oral cavity. So it is essential to diagnose the presence of peg lateral at an early stage of life and provide awareness among the patients that there are treatment options in order to correct the peg lateral. The primary aim of this study was to investigate the prevalence of peg lateral and gender distribution in patients and their awareness towards the correction of peg lateral.

In addition to analytics studies, our team has been working on various comparative studies (Felicita and Chandrasekar, 2012; Verma, Arun and Chandrasekhar, 2015; Vikram *et al.*, 2017); and also recent advancements (Rubika, Felicita and Sivambiga, 2015; G. Sivamurthy and Sundari, 2016; Felicita, 2017b, 2018; Samantha, Sundari and Chandrasekhar, 2017) that are being considered as a breakthrough in orthodontics. Various reviews (Dinesh *et al.*, 2013; Viswanath *et al.*, 2015; Felicita, 2017a; Putri, 2019) and clinical trials (Ramesh Kumar *et al.*, 2011; Jain, Kumar and Manjula, 2014; Krishnan and Saravana Pandian, 2015) also have been conducted in order to create new views and effective treatment options in future. Our team has extensive knowledge and research experience that has translate into high quality publications (Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020) (Kumar *et al.*, 2006; Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Gautham Sivamurthy and Sundari, 2016; Chen *et al.*, 2019). The aim of the present study is to determine the prevalence and gender predilection of impacted canines in the Chennai population. Now the growing trend in this area motivated us to pursue this project.

2. MATERIALS AND METHODS

Study setting

The study is a university setting,, the pros of the study is the availability of vast numbers of data and the limitation of this study is limited to a certain group of population. . Approval was obtained from the institutional committee SDC/SIHEC/2020/DIASDATA/0619-0320. 2 examiners were involved in this study.

Sampling

The study is a retrospective study. Data was collected from June 2019 to March 2020. Totally 2,387 patient records were reviewed and analyzed. The patients who attended the aesthetic dental department willing for aesthetic dental correction were included in this study. Repeated or incomplete patient records were excluded. Cross verification of data for error was done by presence of additional reviewers and by photographic evaluation. Simple random sampling was done to minimise the sampling bias. It was generalised to the south Indian population.

Data collection and tabulation

Records of all the patients who had attended Dental aesthetic dental clinics were collected in a chronological order. The data verification was done on age, gender, presence or absence of peg lateral. The data was entered in excel sheets in a methodical manner and was imported to SPSS.

Statistical Analysis

IBM SPSS 20 software was used for the data analysis. Independent variable includes age, sex. Dependent variables include the presence of peg laterals. Both Descriptive and inferential statistics were used. Descriptive statistics includes frequency of distribution of age, sex and inferential test includes the chi square test.

3. RESULT AND DISCUSSION

Out of 2,387 patients, 2.38% reported with peg laterals (figure 1). Gender predilection shows that the peg lateral was slightly more prevalent in males (1.26%) than in females (1.13%) ($p > 0.05$) is not statistically significant [figure 2]. On analysing the association between peg lateral with quadrant shows that peg lateral was more prevalent bilaterally in maxilla (1.51%; $n=36$) followed by unilateral prevalence reported as (0.88%; $n=21$) (figure3) where ($p < 0.05$) is statistically significant. The different age groups of patients reporting to the clinic with willingness for correction of peg lateral was depicted in (figure 4). It is evident that patients of age groups between 20-30 years (0.88%; $n=21$), followed by 31-40 years (0.80% ; $n= 19$) and < 20 years (0.46%, $n= 11$) had have greater willingness for aesthetic correction of peg lateral compared to other age groups, where p value(< 0.05) which is statistically significant.

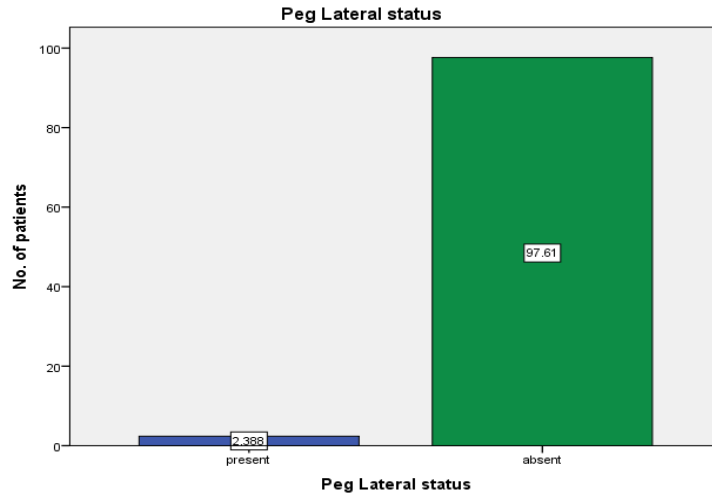


Figure 1: Bar chart represents the prevalence of peg laterals in the Chennai population. X axis represents No. of patients and Y axis represents prevalence of peg laterals. Blue colour depicts presence of peg lateral and green colour represents absence of peg lateral. Majority of patients did not have peg laterals(Green) in chennai population .

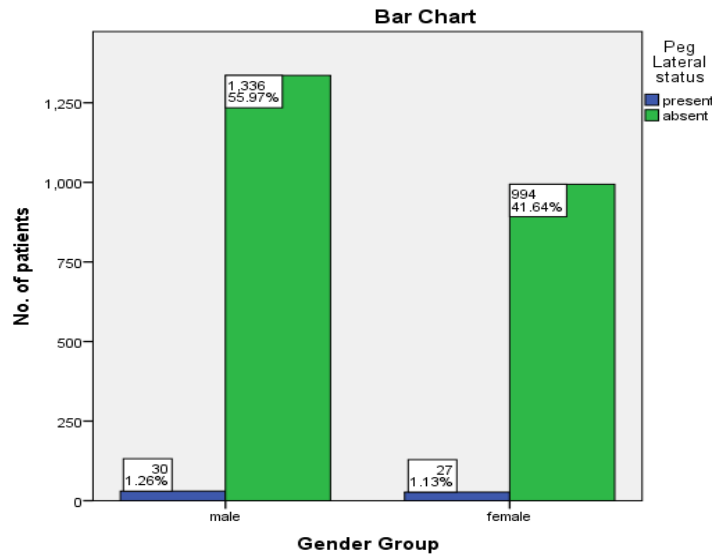


Figure 2: Bar chart depicts the association between gender and peg lateral. X axis represents gender groups and Y axis represents the number of patients. Blue colour depicts presence of peg lateral and green colour represents absence of peg lateral. It is evident that the majority of males had slightly higher predilection than females. Pearson chi square value - 0.504, P value -0.478 There is no significant difference between the gender and prevalence of peg lateral. Hence, statistically not significant (p value > 0.05).

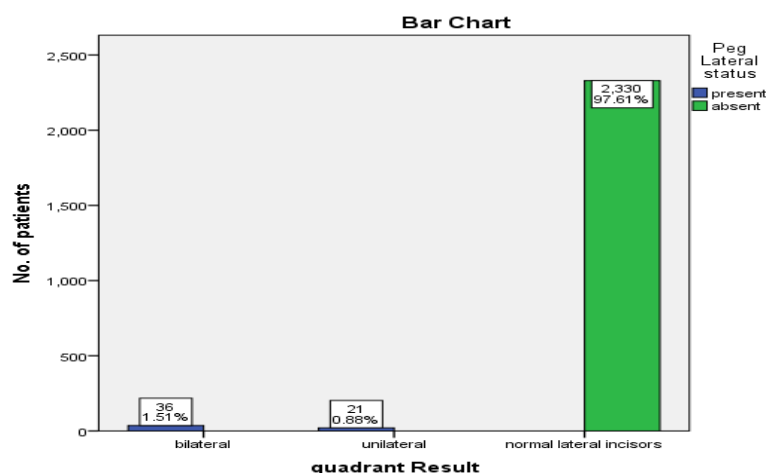


Figure 3: Bar chart shows the correlation between quadrant and presence of peg lateral. X axis represents quadrant and Y axis represents Number of patients. Blue colour depicts presence of peg lateral and green colour represents absence of peg lateral. It is evident that peg lateral was most prevalent bilaterally compared to unilaterally Chi square test., p value- 0.004 . There is a significant difference between the gender and prevalence of peg lateral. Statistically significant p value (< 0.05).

This study is conducted in order to create dental awareness among the patients regarding the role of peg lateral affecting the aesthetics of the patients smile due to its small size and tapered conical shape which is often called as "dracula teeth " due to its shape. Hence, this study was conducted in order to create awareness on the severity of peg lateral among the public, so that they can report to a dentist at an early stage for correction of peg lateral; as well as among dentists for better diagnosis. This study helps a dentist to understand the role of peg lateral in aesthetics of tooth alignment.

The incidence of peg shaped maxillary lateral incisors in this study was found to be 2.38%, this findings correlate with the study done by Jena et al among Odisha population, where the prevalence of peg lateral reported in maxillary lateral incisors was 2.82% (G and Jena, 2013) , and another study done by Fang Hua et al, in their meta analysis have reported an overall prevalence of 1.8% of the total population (Hua *et al.*, 2013). However the study conducted by Farhad Amin et al, had reported a higher prevalence of 5.6% among the patients of Pakistan subpopulation (Amin and Asad, 2011)in university of Lahore. The study conducted by Albasharieh had depicted that prevalence of 3.9% recorded for small maxillary lateral incisors(Albashaireh and Khader, 2006) whereas it is reported 2.9% higher rate of prevalence in Jordanian subpopulation. The prevalence reported in these studies are found to be higher than our study. Various genetic and environmental factors could have played a role in this variation.

In this current study, the number males reported were comparatively greater than female population, so on an overall count, the presence of peg lateral was found to be higher among the male population (57.23%; n= 1,366) where as number of female population reported were (42.71% ; n = 1,021) comparatively prevalence of peg laterals in this study was found less predominantly in females (1.13%) compared to (1.26%). But on an individual analysis, we can understand that the prevalence of peg lateral was higher among females (2.65%) compared to males (2.20%) this discrepancy can be explained, as number of Male patients reported to the the department were higher , but for this population of females the prevalence of peg lateral was higher among the female population compared to males ,this is in consent with the study done by Fatih kazanci(Kazanci *et al.*, 2011), where peg shaped lateral incisors were found in 2.15% patients (45 females & 23 females). The study done by Kim et al (Kim, Choi and Kim, 2017), was also found to be in agreement with our study. He concluded that the prevalence of peg-laterals was 1.69% in boys, 1.75% in girls, and 1.72% overall. Maxillary lateral incisors agenesis recorded by Yemitan et al, Amin et al, Ngang et al, in their studies was noted to be of 6:1 female to male ratio, 4:3 recorded for peg shaped maxillary incisors, ratio of 1.4:1 for small maxillary lateral incisors (Ng'ang'a and Ng'ang'a, 2001; Al-Humayani, 2005; Amin, Asif and Akber, 2011; Yemitan, Adediran and Ogunbanjo, 2017).

In association of unilateral and bilateral prevalence of peg lateral, this present study reported maximum prevalence of bilateral peg lateral (1.51%; n= 36) and followed by unilateral prevalence (0.88%; n= 21). These findings correlate with the study done by Farhat et al, in his study reported that 2:1 ratio of prevalence of bilateral to unilateral prevalence of peg lateral (Amin, Asif and Akber, 2011) . There are studies that showed bilateral peg and small lateral incisors with higher prevalence than unilateral expression (Amin and Asad, 2011; Hameed *et al.*, 2018). However, the study done by Fang et al, reported The prevalence rates of unilateral (0.8%) and bilateral peg-shaped maxillary permanent lateral incisors were approximately the same. However, among the unilateral lateral incisors, the left side (0.4%) was twice as common as the right side (0.2%) which does not agree with our study. Unilateral peg shaped and small maxillary lateral incisors had a higher frequency than bilateral expression in the among nigerian orthodontic patients (Onyeaso and Oneyeaso, 2006) .

In this study, when the patients were interviewed regarding the awareness and self recognition of the dental anomaly it was observed that patient between 20-30 and 30-40 age groups were more aware and self conscious about the individual tooth variations whereas the other age groups > 40 years patients didn't care much of their aesthetic appearance of lateral incisor. From this it is obvious that dental negligence increases as the age increases.

The current research shows that peg lateral is moderately prevalent in the Chennai population and the awareness to the treatment of the peg lateral is less . This suggests the need to spread awareness on diagnosis and treatment modalities of exposure of peg laterals among dentists and public. 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.

4. CONCLUSION:

The prevalence of peg lateral was found to be minimal among the chennai population . Although males were the predominant population in this study, females showed increased willingness for correction of peg lateral compared to males. . Still there are many people who are unaware about the availability of aesthetic correction for peg laterals. This study could be beneficial and provide awareness among the dentists regarding the prevalence and gender distribution of peg laterals which will be helpful for them for better diagnosis and advising the patient for the aesthetic management of the peg lateral. Thus early intervention and treatment for correction of peg lateral can provide better aesthetics and confidence among the younger population in the society.

AUTHORS CONTRIBUTION

First author, Aishwarya performed the data collected by reviewing the patient details, filtering required data, analysing and interpreting statistics and contributed to manuscript writing

Second author, Dr.Aravind Kumar.S contributed to the conception of the study title, the study design, analysed the collected data, statistics and interpretation and also critically revised the manuscript.

Third author, Dr. Suresh.V participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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