Role Of Lateral Incisors In Female - An Impact Towards Attractiveness Of Smile

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Abstract: Dental esthetics is a field of dentistry concerned especially with the appearance of dentition as achieved through its arrangement, form and color. The type of malocclusion, the degree of malocclusion, age, patients’ esthetic desires, practitioners’ style of treatment as well as gender predilection can influence the final esthetic treatment the patient will be subjected to. From functional demands, the patients of the current world, have shifted their demands to esthetics. Esthetics can be simply detected based on the position of lateral incisors. The aim of this study is to determine the prevalence of rotation, overlap and straightly positioned lateral incisors and its impact towards attractiveness of smile in female patients reporting to institutional setup in Chennai. A sample size of 500 patients’ information from a database of an institutional setup in Chennai was taken after reviewing 86,000 patients and a retrospective study was performed followed by data analysis using SPSS version 20.0 software. It can be said that the attractiveness of a smile depends upon the relation of the lateral incisors. P value associated with lateral incisor position and age of the sample size was found to be 0.361.

Keywords: Esthetics ; Females ; Lateral Incisors ; Prevalence ; Retrospective Study

INTRODUCTION
Dental esthetics is a field of dentistry concerned especially with the appearance of dentition as achieved through its arrangement, form and color. This does not just cover the complete dentition and also aims at the beautification of the smile as a whole. The importance of dentofacial appeal in regard to the individual's psychosocial well-being is a proven fact. One of the most important factors that affect people's smiles is teeth. A dental restoration’s positive impact on the patient's smile, appearance, self-confidence and overall mental health can not be underestimated. Dental aesthetic corrections can be categorized into facial esthetics, esthetic orthodontics and esthetic prosthodontics. The type of malocclusion, the degree of malocclusion, age, patients’ esthetic desires, practitioners’ style of treatment as well as gender predilection can influence the final esthetic treatment the patient will be subjected to.

Malocclusion can be defined as an abnormal alignment of upper and lower teeth. A malocclusion can be either minor or severe in nature. For such minor malocclusion, orthodontic treatment without surgery can be advised. In cases of severe malocclusions, surgical treatment might have to be performed. In certain cases, surgery along with orthodontics might still not be the solution with maximum esthetics ((Ganapathy, 2016; Ajay et al., 2017)). At one point of time, esthetic dentistry was a specialty for an orthodontist. But in current times, an oral maxillofacial surgeon and prosthodontist can be considered estheticians ((Turvey, 1988)) . A prosthodontist is responsible for the final outcome and hence uses a single system of implant components to maximize the outcome ((Ashok et al., 2014; Ganapathy, Kannan and Venugopalan, 2017; Duraisamy, Krishnan, Ramasubramanian, Sampathkumar, Mariappan and Sivaprasakasam, 2019)).

In the past world, functional demands were the main and sole focus of dental treatments. With time and technological advancements in dentistry, the main focus of demands had shifted to giving the patient the maximum esthetic values ((Samorodnitzky-Naveh, Geiger and Levin, 2007; Akarslan et al., 2009)). Dental aesthetics itself can be appreciated in cases of good oral hygiene ((Basha, Ganapathy and Venugopalan, 2018)), well designed prosthesis ((Venugopalan et al., 2014; Jain, Ranganathan and Ganapathy, 2017; Kannan and Venugopalan, 2018)) and even in treatment using ceramic restorations ((Ashok and Suvitha, 2016; Kannan and Venugopalan, 2017; Duraisamy, Krishnan, Ramasubramanian, Sampathkumar, Mariappan and Sivaprasakasam, 2019)).

DOI: 10.47750/cibg.2021.27.02.300
ISSN: 2204-1990; E-ISSN: 1323-6903
P-ISSN: 2204-1990; E-ISSN: 1323-6903
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Certain studies show the attractiveness of a smile can be elevated by a simple correction of malalignment of the anterior teeth, such as overlapping, rotations of teeth ((Kokich, 1996)) as well as the anterior teeth selection ((Ariga et al., 2018)). Many studies show that females are much more conscious of smile attractiveness in comparison to males ((Bass, 1991; Garber and Salama, 1996; Spear, Kokich and Mathews, 2006)).

In an institutional setup such as Saveetha Dental College, there are several types of studies conducted such as in vitro studies, reviews, case reports. ((Vijayalakshmi and Ganapathy, 2016; Jyothi et al., 2016; Khan and Kazmi, 2019))

In the given study of lateral incisors’ position, the sample size taken is completely of the female population with no missing teeth present. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhillarasan, 2018; Ezhillarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al., 2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy, Krishnan, Ramasubramian, Sampathkumar, Mariappan and Navararampatti Sivaprakasam, 2019; Ezhillarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhillarasan, 2019; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020)

The aim of the study is to determine the prevalence of rotation, overlap and straightly positioned lateral incisors and its impact towards attractiveness of smile in female patients reporting to Saveetha Dental College, Chennai.

MATERIALS AND METHODOLOGY

A retrospective study was conducted in institutional setup in Chennai, using a database over the duration from June 2019 till March 2020 over the past 8 months with a sample size of 86,000 patients who reported to the institutional setup’s OutPatient ward. The cases are narrowed down from the 86,000 patients to 500 cases. The data of the narrowed down sample size was collected from institutional setup’s Database. The cases were selected on the basis of the age group 18-30 years and were ensured to be of female gender only. The patients were ensured to have no missing teeth. The cases of male gender, missing teeth or replaced teeth as well as age groups above 30 years or below 18 years are excluded from the study.

The study was conducted in a universal setting in a South Indian population. The positives of the study conducted was the similar ethnicity of the sample size of the study as well as the online availability of the database. This study was approved by the Ethical Board of the University. The Ethical number provided for this study was SDC/SIHEC/2020/DIASDATA/0619-0320. There are 2 reviewers involved in the data collection process.

The case sheets of the given sample size of the study are reviewed by the usage of intraoral photos of the patients. Cross verification of the patient’s data is performed to prevent errors. The measure to prevent errors done is to review the observer which will minimize the sampling bias.

The internal validity of the study is applicable. The external validity of the study defines the eligible criteria of the sample size population. The data was tabulated using the Microsoft Excel Spreadsheet and analysis of the data was performed using IBM SPSS version 20.0 software where chi square analytical tests were done.

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In a sample size of 500 patients, all the patients were ensured to be of ages 18 years till 30 years, all are of female population and have no missing teeth. Of that, 45.4% of the cases have rotated lateral incisors, 30.6% have overlapping lateral incisors and 24% have straightly positioned lateral incisors. Using external reviewers, an attractive smile score is given to every patient’s smile where 0 is allocated to a bad smile, 1 to an average smile and 2 is assigned to a good smile.

In a sample size of 500 patients, there are quite a few variables to be related. The following study’s data was collected from intraoral photos of patient details uploaded onto institutional setup’s Database. Using 2 external reviewers, the frontal intraoral photo was designated a score based on the perception of esthetics of the external reviewer. A bad smile was scored 0, average smile was scored 1 and a good aesthetic smile was awarded 2 points. Furthermore, the photos were studied to check if the lateral incisors’ position was symmetric or
asymmetric in nature. Using IBM SPSS version 20.0 software, the data collected was subjected to chi square tests to understand the correlation between all the variables in the study conducted.

RESULTS & DISCUSSION
Dental aesthetics, in short, can be said to be the level of attractiveness of a smile. Every smile involved the anterior teeth, predominantly consisting of the teeth from either cornerstone of the mouth, which included central incisors as well as canines [(Kokich, 1993)].

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The sum total of the attractiveness smiles score distribution can be as follows:
- Rotated lateral incisors - 165,
- Overlapped lateral incisors - 125,
- Straight lateral incisors - 235

Fig 1: The above graph represents distribution of Lateral Incisor Position. X axis denotes the position of lateral incisors and Y axis denotes the number of patients with overlapped, rotated or straight lateral incisors. There is a higher percentage of rotated lateral incisors (45.6%) followed by overlapped lateral incisors (30.4%) and the least percentage is seen in straightly aligned lateral incisors (24%).
Fig. 2: The above graph represents frequency of smile evaluation based on lateral incisor positioning. X axis denotes the smile evaluation (bad, average, good) and Y axis denotes the number of patients. There was a higher average attractive smile (59%), followed by an attractive good smile (23%) and a less attractive bad smile (18%).

Fig. 3: The above graph represents the relation between Lateral Incisor’s Position and age group of patients. X axis denotes the age of patients and Y axis denotes the number of patients. Less than 30 years of age rotated lateral incisors were noticed more. Pearson’s chi square value = 2.037; P value = 0.361 (p > 0.05). Thus there is no significant association between Lateral Incisor’s Position and age of patients.
Fig. 4: The above graph represents the association between Symmetry in Lateral Incisors’ Position and age group. X axis denotes the age group and Y axis denotes the number of patients. Both the age group showed the maximum unilateral symmetry of lateral incisors. Pearson's chi square value = 0.006; P value = 0.939 (p>0.05). Thus there was no significant association between Symmetry of Lateral Incisors’ Position and age of patients.

Table 1

<table>
<thead>
<tr>
<th>SMILE</th>
<th>SYMMETRY</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNILATERAL</td>
<td>BILATERAL</td>
<td></td>
</tr>
<tr>
<td>LESS ATTRACTIVE (Bad)</td>
<td>4.4%</td>
<td>95.6%</td>
<td></td>
</tr>
<tr>
<td>AVERAGE ATTRACTIVE (Average)</td>
<td>100%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>VERY ATTRACTIVE (Good)</td>
<td>53%</td>
<td>47%</td>
<td></td>
</tr>
</tbody>
</table>

Pearson’s Chi Square = 338.96
P Value = 0.001

Table 1 shows the association between Smile Evaluation and Symmetry in Lateral Incisor’s Position. There is a strong positive correlation (phi = 0.8) and significant association between Symmetry in the Lateral Incisor’s Position and quality of smile. Pearson’s chi square value = 338.96; P value = 0.001 (p<0.05). Unilateral symmetrical smile is more effective towards an average to good attractive smile.

Table 2

<table>
<thead>
<tr>
<th>LATERAL INCISOR POSITION</th>
<th>OVERLAP</th>
<th>ROTATED</th>
<th>STRAIGHT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS ATTRACTIVE (Bad)</td>
<td>30%</td>
<td>70%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

Pearson Chi Square = 479.49
Table 2 shows the association between Smile Evaluation and Lateral Incisor’ Position. There is strong positive correlation (phi=0.9) and significant association between Smile Evaluation & Lateral Incisors’ Position. Pearson’s chi square value = 479.492 ; P value = 0.001 (p<0.05). Rotated incisors are more prevalent towards an average attractive smile and overlap types are more prevalent for bad smiles whereas a good attractive smile consists of straightly positioned lateral incisors.

Asymmetry of lateral incisor showed average to good attractive smile while bilateral symmetric lateral incisor showed smile with less attractiveness as shown in Table 1.

In [(Ali and Hossain, 2013)] study, individuals with Angle’s class I and class III show significantly greater prevalence of tooth size discrepancies than individuals with class II. Another study given by [(Muhammad, Nezar and Azzaldeen, 2016)] showed that very short and very long maxillary lateral incisors were consistently perceived as “least attractive” smiles. In [(Shaw, 1981)] study, it shows that normal dental appearance would be judged to better looking, more desirable as friends, more intelligent, and less likely to behave aggressively.

Every study has its own limitations to overcome. One such limitation is the usage of photos of the patient and this can be overcome by reviewing the details of the patients intraorally. This study was conducted with the intent of enabling practitioners to early detection of the midline diastema causative agent and hence allows minimal invasive treatment using advanced techniques to provide treatment. 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; Zhilarasann, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyaadharsini, 2019; Mathew et al., 2020)

CONCLUSION
Within the limits of the study, it can be said that the attractiveness of a smile depends upon the position of the lateral incisors in a smile. Asymmetrical positioning straight and rotated lateral incisors has a higher impact on attractive smiles than symmetrical smiles.

AUTHOR CONTRIBUTIONS
First author, Dr Nadhirah Faiz, performed the analysis, and interception and wrote the manuscript. Second author, Dr.Subhrajata Mait, contributed to conception, data design, analysis interpretation and critically revised manuscript. The third author, Dr Ifmat Nasim, participated in the study and revised the manuscript. The fourth author, Dr. Jessy, revised the manuscript as per guideline, alignments and formatting. All the authors have discussed the results and contributed to the final manuscript.

ACKNOWLEDGEMENT
Thanks to Saveetha Dental College for allowing us to review the case sheets.

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