MEASUREMENT OF VISIBLE TEETH SURFACE AREA OF THE UPPER AND LOWER ANTERIOR TEETH DURING SPEECH, USING VIDEO PHOTOGRAPHIC METHOD IN YOUNG ADULTS - A SURVEY

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ABSTRACT
To measure the visible teeth surface area of the upper and lower anterior Measurement Of Visible Teeth Surface Area Of The Upper And Lower Anterior Teeth During Speech, Using Video Photographic Method In Young Adults - A Survey. 90 subjects were selected between the age group of 18-25 years (40 male and 50 female) with mean age of 22 years. Then the subjects are asked to sit in an erect position and read the paragraph containing bilabial and sibilant words which helps in display of anterior teeth. The video camera was adjusted to the subjects mouth level at 4 feet distance. The total surface area of maxillary and mandibular anterior teeth is calculated using a photograph, followed by measurement of maximum and minimum visibility of maxillary and mandibular anterior teeth during speech is measured using video photographic method and data is subjected to compute analysis. The visible surface area of maxillary anterior is about 78.16 %, and the mandibular anterior is about 70.61% in young adults during speech.

KEYWORDS: Teeth during Speech, Video Photographic Method.

INTRODUCTION
The smile is one of the most important facial expressions; visibility of maxillary and mandibular anterior teeth is the major contributing factors for facial esthetics which motivates the patient to seek dental treatment. The visibility of anterior teeth plays an important role to the facial appeal. They give each face a unique identity, just as eyes, nose, and skeletal proportions make each face distinctive. Esthetics have become increasingly important in the practice of modern restorative dentistry and are synonymous with a natural, harmonious appearance. The visibility of the teeth during speech becomes an important part of facial attractiveness and also to enhance the aesthetic appearance of the oral region. This emerging concept of facial attractiveness has led clinicians to broaden their aesthetic analysis by including the ‘display of dentition’ during speech in their diagnosis and treatment planning. Zachrisson was perhaps one of the first to allude to such an analysis of the dentition. He proposed the word ‘cheese’ to evaluate the display of the dentition as its articulation helps to obtain a repeatable method to assess the patient in an ideal lip-tooth presentation during speech. Other studies have also compared dental display findings for the posed smile, spontaneous smile, and speech. These studies have led to differences between the display of the dentition during speech and smile. The amount of visible upper anterior teeth, with lip at rest or during function, is an important aesthetic factor in determining the outcome of fixed and removable Prosthodontics care, implant dentistry, operative dentistry, and orthognathic surgery. Improvement of dental and facial esthetics is an important indication for dental treatment. Photographic records aid in identifying esthetic disharmony, planning for esthetic correction, and establishing mutually compatible esthetic expectations of the patient and the dentist.

MATERIALS & METHODS
90 subjects were selected between the age group of 18-25 years (Male 40 and female 50) with a mean age of 22 years having all the anterior teeth with normal over jet and over bite without Crowding or spacing. Average upper lip length, normal occlusal alignment no history of past dental treatment. Intraoral Photograph was taken for each individual to calculate actual surface area of the anterior teeth. (Figure1). video setup was done with a Camcorder (Sony DCR-SR47 HDD) on a stable tripod adjusted to the subjects mouth level at a 4 feet distance and this set up was fixed throughout the study (Figure2). The participants were given the paragraph containing Bilabial sounds and sibilants containing well before the recording so that they are accustomed to the words and the same was projected on the screen. Each participant was asked to read three times with a gap of 30 seconds in between (Figure3). The Individual video recording was played and snapshot was captured showing maximum and minimum visibility of the maxillary and Mandibular anterior teeth.

ANALYSIS
Total surface area of maxillary and mandibular anterior teeth is calculated from a photograph using AutoCAD.
program. (Figure4/5). Followed by measurement of Maximum & Minimum visibility of anterior teeth during speech is measured on a snapshot taken from the video (Fig 6&7). The measurement of the visible surface area is done by same technique in which the values are given in mm² (Table 1 & 2). The same procedure is followed for all the 90 subjects and the visibility of the Anterior teeth during speech is analyzed, subjected to descriptive statistical analysis and was interpreted in percentage.

RESULTS
90 subjects were selected between the age group of 18-25 years with a mean age of 22 years based on the data the visible surface area of maxillary anterior is about 78.16 % and the mandibular anterior is about 70.61% in young adults during speech.

Table 1: Maxillary Anteriors (Average value tabulated for 90 subjects)

<table>
<thead>
<tr>
<th>Actual Surface Area of maxillary incisors (mm²)</th>
<th>Visible teeth surface area During Speech (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Value</td>
<td>Min. Value</td>
</tr>
<tr>
<td>268.26</td>
<td>228.12</td>
</tr>
</tbody>
</table>

Table 2: Mandibular Anteriors (Average value tabulated for 90 subjects)

<table>
<thead>
<tr>
<th>Actual Surface Area of mandibular incisors (mm²)</th>
<th>Visible teeth surface area During Speech (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Value</td>
<td>Min. Value</td>
</tr>
<tr>
<td>186.12</td>
<td>144.26</td>
</tr>
</tbody>
</table>

DISCUSSION
The presence of anterior teeth plays an important role in facial esthetics. The amount of visible anterior teeth, with lip at rest or during function, is an important esthetic factor in determining the outcome of any prosthodontic treatment. Until now few researches investigated tooth display and reported reliable analysis of their methods. As a result of aging, there will be increase in interincisal distance, loss of muscle tone that allows the lower lip to sag and upper lip to drop. There will be loss of elasticity of the upper lip and incisal and occlusal wear due to these reason mandibular teeth are more visible in older age than the young adults.9

In recent years, there has been an increasing trend to pursue smile-oriented aesthetic results while planning orthodontic treatment.10 Smile aesthetics has become paramount from patients’ perspective and therefore the clinicians have made it the cornerstone of their treatment mechanics.11,12 Naturally, as people start to focus more on the physical attributes of smile, researchers too re-orient their focus in finding scientific parameters that assess the smile and help the clinician provide patients with better treatment outcomes.13-17 In order to create a pleasing esthetic result, the degree of tooth visibility should not be considered separately from other aesthetic determinants for the degree of visibility of tooth structure must be in harmony with contours, size, incisal edges, occlusal plane, lip line, smile line, and the location of the midline. The vertical positioning of maxillary anterior teeth cannot be established by the visible amount of tooth alone as anterior guidance and phonetics also play an important role in anterior teeth positioning.18 Therefore, the aim of this study was to use videography to analyze the display of the maxillary and mandibular anterior teeth during speech in young adults by measuring total surface area of the teeth through the video graphic frame during speech. An additional goal was to establish average values of display of the dentition during speech along with other accompanying perioral changes.

In this survey image capture was accomplished by filming with a digital camera and analysis was done by using AutoCAD program to ensure the recording more accurate observation of functional visibility during speech.

CONCLUSION
A survey has been presented that a reliable assessment of the visible teeth surface during speech can be obtained with this digital video graphic method, this method is suitable for clinical practice in view of increasing esthetic demands of patients. In future with more advanced technique and large sample size, study can throw more light in this regard.
Fig. 3: Video recording

Fig 4 : Photograph to measure actual surface area of anterior tee

Fig 5: Measurement of Visible area using AutoCad

Fig 6: Snapshot from video to measure visibility of maxillary anterior teeth during speech

Fig 7: Snapshot from video to measure visibility of mandibular anterior teeth during speech

REFERENCES


