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The gum and tooth show preference during smile by the patients visiting qassim university dental hospital

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Abstract

Objectives: To determine the preference of incisal and gum show during smile by the patients visiting the qassim university dental hospital.

Methods: It is a Cross sectional study, consisting of questions regarding the dynamic smile. Questionnaire was given to 162 patients to assess their preference about the incisal and gum show during smiling.

Results: Full incisal show and 2mm of gum show is the preferred attribute by the patients during the dynamic smile. There was significant difference between the genders in some of the values of incisal and gum show.

Conclusion: Patients preferred full incisal show and 2 mm of gum show during smile. There is increased awareness of patients regarding the ideal standards of smile. Orthodontists and dentists should be mindful to achieve these standards.

Keywords: incisal show, gum show, patients, dynamic smile, and orthodontists.

1. Introduction

Esthetics in orthodontics has been defined mainly in terms of profile enhancement, but if we ask a layperson or a patient, their answer will usually include something about creating beautiful smiles. The study of frontal facial form dates back to Egyptians, who depicted ideal facial esthetics as golden proportion. This concept has been described extensively in classical art and orthodontic literature. [1] In the later part of 19th century, Norman Kingsley, the leading orthodontist of the era, emphasized the esthetic objectives of orthodontic treatment. In the Kingsley paradigm the articulation of teeth was secondary to facial appearance. [2] Edward Angle introduced hard tissue paradigm in the orthodontic diagnosis. He believed that diagnosis and treatment planning should focus on skeletal and dental components and soft tissue were only a byproduct. [3] When orthognathic surgery developed in 1970,s and growth modification treatment reappeared for children; the goal was to obtain ideal occlusion more than better facial proportions. [4]

In the 1980,s the introduction of wide spread esthetic material in restorative dentistry led to pervasive adoption to the "Esthetic Dentistry". This steered the emergence of soft tissue paradigm in orthodontics. From that time onwards lot of work and research is done on soft tissue diagnostic parameters in orthodontics. Ackerman and Proffit introduced the smile mesh and described the morphometric analysis of smile by highlighting the attributes of macro, micro and mini esthetics of smile. These attributes are smile arc; smile line, buccal corridors, incisal show, gum show, tooth size, tooth and gingival color to name the few. This opened up a totally new dimension of orthodontic diagnosis. [5, 6, 7]

The contemporary orthodontist no longer evaluates the patient on mere cephalometric and study cast. Rather he contemplates the profile and smile in 3 dimensions statically and dynamically. In order to do so the orthodontist must work with two dynamics. First the soft tissue response and animation assessed at the patient's examination, which includes smile arc, smile line, incisal show, gingival display and other attributes of smile mesh. Second are the soft tissue changes, which will take place throughout the life of an individual. [8, 9, 10, 11, 12]

The incisal show and gum display of smile are two very important aspects of smile analysis and constitute the micro-esthetic of smile mesh. Incisal show is defined as the amount of maxillary incisors seen at rest position. [6] Gingival display is defined as the amount of gingival show above the central incisor crowns and below the center of the upper lip. Up till 2 mm of

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gum show during smile is considered as ideal and up till 4 mm is acceptable within the bounds of esthetic norms. The analysis of these two attributes is not only vital to orthodontic diagnosis and treatment planning, it is affected greatly by soft tissue changes and aging process which takes place throughout the life of an individual. [13, 14, 15, 16]

Quantification of resting and dynamic tooth lip relationship is critical to smile dynamics. The amount of maxillary incisor show at rest is also a critical parameter esthetically. As a general guideline in adolescents around 3 to 4 mm of maxillary incisor should be visible at rest and almost the entire maxillary incisor and some of the gum (2 mm) should be visible on smiling. Generally males show less upper and lower incisors and vice versa in females. Peck showed that normal display of maxillary incisors with relaxed lips at 15 years of age is 4.7+ -2 mm for boys and 5.3+ -1.8 for girls. This sexual dimorphism is evident at all ages. [17]

The increasing influence of electronic and print media has made the dental patients in general and orthodontic patients in particular extremely cautious and knowledgeable about different aspects of smile and esthetics. Patients are best critique of self-smile and have pre-emptive idea to what they desire from their dental/orthodontic treatment. This study was done to assess the preference of dental patients with the incisal show and gingival display during the smile. The study will be helpful in assessing the predilection of patients and help incorporate patient centric approach during the treatment planning.

2. Materials and Methods

This was a cross sectional study done to assess the preference of tooth show and gingival display during smile in the patients visiting the dental hospital in Qassim University. The study was approved by the ethical committee of the Qassim University under the code#: EA/80/2014. 162 patients participated in the study. 74 of them were females and 88 were males. Patients were selected by random convenience sampling. A self-administered questionnaire about the dynamic smile esthetics was given to each patient to fill. The questionnaire had questions regarding the preference of incisal and gingival show during smiling. The question included that

whether the patient liked to show whole of the maxillary central incisors, half of the maxillary centrals or none of it during smiling. Also whether they liked to show 6mm, 4mm, 2mm or 0 mm of gum during smiling. Patients were briefed about the incisal and gum show during smile. Data from the questionnaire was entered in SPSS 22. The variables were calculated in the form of age and gender. The percentages of preferred values of incisal and gum show were calculated by using cross tabs and the means between males and females were compared by using the chi-square test.

3. Results

The results of the study are depicted in table I, II and III. The highest percentage of females was who preferred full incisal show on smiling followed by half of incisor show and negligible percentage preferred no incisor show on smiling. There was a significant difference between the preference of “full and half incisal show on smiling” amongst the female subjects of the study. 68.9% preferred to show full maxillary incisors on smiling and only 29.7% liked to show half incisors teeth. However in males almost equal number of males preferred to show full incisors and half incisors on smiling (48.9% and 46.6% respectively). There was significant difference between the females and males in “half incisal show on smiling”. Statistically less percentage of females preferred the half-incisal show than males ($P<0.05$) (Table III). The percentage of those who preferred no incisal show on smile was negligible. (Table I)

In the gum show preference during smile; amongst the females the most preferred was 2mm of gum show (79.7%). The same trend was seen in males (64.8%). A very small percentage of subjects preferred 6mm gum show during smile for both males and females (17.6% for females and 19.3% for males). 4mm of gum show was also preferred by a small percentage of patients. But when compared with females and males, males preferred 4mm of gum show during smile more than the females (2.7% in females and 11.4% in males). This difference was statistically significant ($P<0.05$) (Table III). 0% of the females preferred 0mm gum show on smiling while only 4.5% of the males preferred to show 0mm of gum show on smile (Table II).

Table I: Showing the percentage and frequencies for tooth show during smiling

	Q. Do you like to show all, half or none of maxillary incisors teeth while smiling?	Maxillary Incisors show			Total
		All	Half	None	
Female	Frequency	51	22	1	74
	% within gender	68.9%	29.7%	1.4%	100.0%
Male	Frequency	43	41	4	88
	% within gender	48.9%	46.6%	4.5%	100.0%
Total	Frequency	94	63	5	162
	% within gender	58.0%	38.9%	3.1%	100.0%

Table II: Showing the percentage and frequencies of gum show during smiling

	Q. Do you like to show 6, 4, 2 or 0 mm of gum show during smile?	Gum Show				Total
		6mm	4mm	2mm	0mm	
Female	Frequency	13	2	59	0	74
	% within gender	17.6%	2.7%	79.7%	0.0%	100.0%
Male	Frequency	17	10	57	4	88
	% within gender	19.3%	11.4%	64.8%	4.5%	100.0%
Total	Frequency	30	12	116	4	162
	% within gender	18.5%	7.4%	71.6%	2.5%	100.0%

Table III: Showing the level of significance for incisal show and gum display between both the genders

Attribute	P value at 0.05 % level of significance
Tooth show during smiling	0.029*
Gum show during smiling	0.033*

4. Discussion

Facial and dental esthetics has been documented to affect people's perception of others and have impact on some forms of quality of life.^[18, 19] In the last decade there has been a movement to consider esthetics as a critical focus in diagnosis and treatment planning in orthodontics.^[20] Until recently, little objective information has been available on how different variables affect the perception of smile esthetics.

In this study both the males and females preferred to show full maxillary incisors on smiling. The preference was consistent between both the genders. No incisal show was negligibly preferred by the both genders. A study done by Pithon *et al.* showed that maxillary incisors not being much visualized is characterized as hardly attractive and is not preferred by even the patients or laypersons.^[21] However in our study a statically significant difference existed in the half incisal show preference between males and females. More percentage of males preferred to show half incisors during smile. The number of males was twice as high as females.

In our study 2mm of gum display was preferred during smile. A study done by Ker *et al.* showed that the 2mm of central incisor crown coverage was preferred by the patients.^[22] A study done by Suzuki *et al.* showed that lay people accepted a gummy smile from 0 mm up to 5 mm. This somewhat is the same as well as opposite of what we found in our study. In our study percentage of 6 mm or 4 mm of gum show on smiling was significantly lower than 2mm of gum show.^[23] A study done by Elham showed that a gingival display of more than 2mm was considered as unattractive by the laypersons.²⁴ However the 4 mm gum show was significantly different between males and females. A higher number of males preferred this range of gum show as compared to the females.

The incisal and gum show during smile is undoubtedly one of the most important aspects of smile dynamics. Since the amount of incisal show and gingival display that is acceptable esthetically can vary widely, the patient's view and preferences should be the major parameter in the decision-making process of treatment planning. As professionals we must keep in mind the preferences of our patients while we formulate the treatment plan for them. This will help us achieve satisfactory results at the end of orthodontic treatment. The results of this study also show how intelligent our patients have become over the years. Norms which were preferred by specialists are seen preferred by lay persons and patients. This could be attributed to increased exposure to electronic and print media, heightened celebrity culture and increased consciousness with time.

5. Conclusion

The patient's perception of dynamic smile characteristics showed their preference for full incisal and 2 mm of gum show on smiling. This trend was consistent between males and females. However there was significant difference at half incisor show and 4 mm of gum show between the male and female patients. With increased awareness by the patients orthodontists should be on their guard to achieve dynamic smile, which caters to patient's need.

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