

Comparison of smile perception by orthodontists and other specialty dentists

Farhia Dahir Abdi Jama ^a, Abdul Jabbar Baloch ^b, Abdul Ghani Shaikh ^c, Abdul Bari ^d
Irfan Shaikh ^e, Ramesh Lal ^f

Abstract

Introduction: As the orthodontist align and correct the malocclusion, they show a great deal of attention to any dental asymmetry ⁽¹⁾. During orthodontic diagnosis and treatment planning, it is very essential to assess and estimate the location of the midline of the dentition in relation with the midline of the face ⁽²⁾.

Material and Methods: In dental and orthodontic OPD at Liaquat University of Medical and health sciences, the data was collected from August 2018 to February 2019. 76 participants from orthodontists and other specialty dentists who met inclusion criteria were included in the study. According to the field of the participants they were grouped into four groups. They were asked to select the preferred smile of 3 modified pictures of Deviated Upper Dental Midline position (i.e. 1mm, 2mm & 3mm) to the left from the midline of the face.

Results: There was no notable contrast in the perception of the deviated upper dental midline to facial midline by orthodontists and other specialty dentists (P-value 0.566). Majority of the participants in this study preferred 1 mm UMD to the left and this shows that despite the shift in the upper dental midline the participants preferred the least deviation as acceptable as to more deviation.

Conclusion: It is concluded that both specialties who evaluated the smile showed no remarkable difference between them in their smile assessment.

Keywords: Symmetry; dental midline deviation; orthodontics

Introduction

Beauty of the face is considered important part that is evaluated by the society along with balanced body features.^{1,3} Harmonization between soft tissue and the teeth result in pleasing and lovely smile.⁴ The view of aesthetic differs between individuals,

each person has different experience along with different surrounding environment and because of the variation in people's opinion about the perception of the smile it is difficult to establish a uniform value that distinguish pleasing smile from unpleasing smile.⁵ In order to produce a beautiful smile, it is very important to recognize different attributes of smile aesthetic.⁶ The facial midline and the maxillary midline should be on the same vertical line.⁷ Midline deviation can be seen alone or in combination from unevenness in the dentition or deviation originated skeletally or mandibular shift during function.⁸ Many studies reported that the maxilla have more discrepancies than the mandibular discrepancies and in study done by shah et al,⁹ and vig et al¹⁰ they believed that the dento-alveolar area displays fewer unevenness comparing to the facial and skeleton asymmetries, they expect that it

^a Corresponding Author; BDS, MSc; Consultant Orthodontist. Jamshoro. Pakistan. Email: f9238@hotmail.com

^b BDS, FCPS, FFD (RCSI); Assistant Professor, Department of Orthodontics, Institute of Dentistry, Liaquat university of medical and health sciences. Jamshoro. Pakistan.

^c BDS, MSc; Senior Lecturer, Department of Science of Dental Materials. Institute of Dentistry, Liaquat university of medical and health sciences. Jamshoro. Pakistan.

^d BDS, MSc; Assistant Professor, Department of Community Dentistry. Institute of Dentistry, Liaquat university of medical and health sciences. Jamshoro. Pakistan.

^e BDS, FCPS; Associate Professor, Department of Prosthodontics. Institute of Dentistry, Liaquat university of medical and health sciences. Jamshoro. Pakistan.

^f BDS, MSc, MBE; Senior Lecturer, Department of Orthodontics. Institute of Dentistry, Liaquat university of medical and health sciences. Jamshoro. Pakistan.

could have resulted from adaptation mechanisms to the abnormalities⁹ For every patient who comes for treatment it is necessary to go through the appropriate database to locate midline deviations so the proper diagnosis of its cause, degree of deviation, position and how to correct it, could be established.¹⁰ Correction of the deviated midline of the upper and lower jaws is crucial objective during the treatment because coincident dental midlines help in achieving proper functional occlusion and also in the establishment of proper molar and canine relationship.¹¹ Also, unfavorable consequences can result from uncorrected dento-facial asymmetries because the patient will not have optimum function, aesthetic or even stability after the treatment.¹² However, in some cases it is difficult to perfectly orient the facial and dental midlines.¹³ Comprehensive midline correction might sophisticate the treatment in some cases by increasing the treatment time for the correction, it might also require removal of teeth to make space for the correction also cumbersome mechanics and wire manipulations could be necessary and if midline elastics are required, then patient compliance is need.¹⁴ Therefore, some general dentists and specialists may leave the rectification of minor asymmetries because they are certain that lay people cannot readily spot such differences.¹⁵ Towards the end of the treatment, the orthodontist should make sure that the facial and both dental midlines are coinciding. However, if that is not possible to achieve, then the midline of the upper and lower jaws should be parallel to the midline of the face. If the midline between upper central incisors is tilted and forms an angle to facial midline then that is known as "canted midline". The problem with canted midline is that it does not show the natural aesthetic appearance.¹⁶ Without accurate diagnosis and treatment planning of the asymmetry, orthodontist will face difficulty during the course of the treatment and maybe

forced to extend duration of treatment in order to correct discrepancies.¹⁷ The orthodontist must outweigh the benefits of going too far in treatment when it comes in deciding of treating or agreeing of leaving the shifted upper midline as it is. So, taking such decision may depend on the degree in which perception of the midline shift affects adversely the esthetic of the face and teeth.¹⁸ Therefore this study will help in understanding the impact of deviated upper midline on the smile perception between orthodontists and other specialty dentists.

Material and Methods

After the acceptance from the ethical committee, this comparative cross-sectional study was held at dental and orthodontic OPD of LUMHS Jamshoro from August 2018 to February 2019. This study consisted total of 76 participants from orthodontists and others specialty dentists. consultant, FCPS, MSc and general dentists from both genders were included in this study. While candidates who did not bear valid PMDC registration were excluded from this study. In this study informed consent was taken from one person who had an ideal smile with normal dento-alveolar relations. Front view picture of the person smiling was taken with a Samsung digital camera at standard setting of 10 mega pixel, at auto mode, at distance of 2 feet. White back ground was used for pictures. The entire facial photograph was not used, the picture was cropped so as to evince the lower one third of the face, particularly the smile. A series of 3 images with progressive alteration and modification were prepared by deviating the upper dental midline 1mm, 2mm and 3mm to the left from the facial midline (Figure 1). These photos were blinded to the participants by not revealing the changes that were made on the images. After preparing them in power point presentation, they were emailed to the participants in the study to select the preferred smile photograph.

Results

A total of 76 doctors who participated and met the inclusion criteria were included in this study. Among these participants 34.2% were males while the rest 65.8% were females. The mean age of the participants was 30.32 ± 7.630 . the minimum age was 23 years and maximum were 59 years. According to the specialty the participants were divided into 4 groups (i.e. Orthodontic Consultants, Orthodontic residents, other specialty consultants and other specialty residents). (Table-I) shows the frequency distribution of participants selecting different extents of upper midline deviation. (Table -II) the frequency of the selected three variables of upper midline deviation by each of the four groups in this study. (Table-III) shows mean and standard deviation of upper midline deviation as selected by male and female participants, for the males subjects alone the acceptance threshold were 1.54 ± 0.647 mm and for the females subjects the threshold was 1.62 ± 0.753 mm. There were no remarkable difference between the 2 subjects (P-value 0.640). As it is given away in (table-IV), there was no notable difference in the evaluation of the maxillary dental midline deviation between other specialty dentists and the orthodontists.

Table I: Frequency distribution of participants selecting different extents of upper midline deviation.

Extent of UMD	Frequency	Percent	Valid Percent	Cumulative Percent
1mm umd to the left	41	53.9	53.9	53.9
2mm umd to the left	25	32.9	32.9	86.8
3mm umd to the left	10	13.2	13.2	100.0
Total	76	100.0	100.0	

Table II: Frequency distribution of orthodontists and other specialty dentists for preferred smile.

Specialty	Upper Midline Deviation			
	1mm	2mm	3mm	
Orthodontic resident	22	8	5	35
Orthodontic counsltant	1	1	1	3
Other speciality resident	16	13	3	32
Other speciality counsltant	2	3	1	6
Total	41	25	10	76

Table III: Mean and SD of upper midline deviation as selected by male and female participants.

	GENDER	N	Mean	Std. Deviation	Std. Error Mean	P-value
Upper Midline Deviation	MALE	26	1.54	.647	.127	0.640
	FEMALE	50	1.62	.753	.106	

Table IV: Comparison of mean score between orthodontists and other specialty dentists.

Specialty		Mean	Std. Deviation	P-value
Orthodontic resident	35	1.51	.742	0.566
Orthodontic counsltant	3	2.00	1.000	
Other speciality resident	32	1.59	.665	0.566
Other speciality counsltant	6	1.83	.753	
Total	76	1.59	.715	



Figure 1: Images with progressive alteration and modification

Discussion

The aim of the orthodontist at the end of the treatment is achieving aesthetic smile as well as functional occlusion.¹⁹ A smile that is not aesthetic could have impact on overall beauty of the face.²⁰ Many studies have used new technologies such as computer-aided imaging to study different ways in evaluation of dental appearance. The posed smile can be frequently repeated and it reveals esthetic details of the smile that are not detected while a person speaks or when in repose. Therefore, aside from the influence of the smile socially and psychologically, it is crucial to study and assess the smile from different aspects.²¹ As it is shown in (Table-I) the 1mm upper midline deviation to the left was selected by 41 participants from the total 76 participants of this study as the preferred smile. This is in agreement with a study done by Jeffrey W. Beyer and Steven J. Lindauer who proposed that when the deviation of the midline is greater than 2.0 mm it can be detected by lay people, and that orthodontists and general dentists are the least forbearing to this esthetic deviation.² (Table -II) shows that 23 of orthodontist participants being the majority preferred smile with 1mm deviation to the left while 9 and 6 participants only preferred 2mm and 3 mm UMD to the left respectively. On the other hand, the other specialty participants showed almost an even distribution in the selection between 1mm UMD as it was selected by 18 participants and 2mm UMD being selected by 16 participants and 4 participants preferred smile with 3mm UMD to the left. This shows that the

orthodontists are more sensitive in perceiving any deviation in the midline more than the other specialty dentists. This is in an agreement with Sérgio Pinho et al study whom results showed that orthodontists were able to spot a midline deviation ≥ 1.0 mm and 3.0 mm for prosthodontists while laypeople saw no variation.²² This is opposite to study done by Vincent Kokich et al. who said that 4 mm was borderline where the orthodontists graded it as significantly less esthetic than the others.²³ In this study there was no significant difference of smile perception between both genders with Upper midline deviation (P-value 0.640) which is in contrast to a study done by Yi-fan Zhanga who found that the gender of the evaluator affects his or her esthetic evaluation of midline deviation.²⁴ In certain cases, where the difference in the deviation between the dental and facial midlines is slight, it is difficult to extract teeth for the midline correction as this is not a simple decision also this might increase both the complexity and the length of treatment.²⁵ This was related to the extent to which the dental midline can deviate from the facial midline and still be considered aesthetically acceptable. This acceptable amount of deviation was mentioned in article review that was done by Guilherme Janson et al taking into consideration that either layperson or another more accurate observer can be part of our patient's environment it is advised that 2.2 mm to be the maximum limit of acceptable midline deviation.²⁶

Conclusions

It was concluded that there was no significant difference in the smile perception of the deviated upper midline position between orthodontists and other specialty dentists. Therefore, it is of paramount important to understand different aesthetic norms to achieve best treatment result for each patient.

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