

Correlation of Facial and Dental Midline and Coincidence of Maxillary and Mandibular Midline in Population of Jammu Region

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ABSTRACT

Background: Nature has gifted us everything in a proper harmonious balance, maintaining the proportions of life. Our face is no exception with eyes, nose, ears, mouth, all inter-related in fixed maintained proportions. Despite of all this, deviations are seen in every second subject observed minutely. The purpose of the study is to determine the observable deviation between facial and dental midline and deviation between maxillary and mandibular dental midline in men and women subjects of Jammu region. 800 subjects, out of which 400 males and 400 females were selected for the study based on inclusion criteria. Photograph as well as casts were made for each patient and statistically analyzed. Results suggest us that around 80% of Indian population have coinciding facial and maxillary midlines and can be used as a reliable guide to arrange maxillary teeth while fabricating prosthesis. A small deviation of 0.5-1 mm in mandibular midline is acceptable and can be used to provide life-like appearance to the prosthesis.

Keywords: Cast, Deviation, Midline, Proportion, Prosthesis.

INTRODUCTION

Esthetics is one of the most important reasons for the patients to seek prosthodontic treatment. In today's world, looking good is a prime concern and appearance is closely linked to social acceptance and professional success. The dentistry too has evolved from curative to a creative science in a short span of time thus, enhancing the spectrum of dentistry from prevention and treatment of disease to prevention, treatment of disease along with better esthetics of the patients.

Beauty is a combination of reality and personal perception. The study of elements of beauty and analyzing them by certain human made references constitute Dento-facial esthetics.¹ The facial midline is determined by the landmarks such as nose, philtrum and pogonion aligned in a straight

line. The dental midline is the mid sagittal line of maxillary and mandibular arches when teeth are in maximum intercuspation. Ideally, both facial and dental midlines should coincide in a straight line.² Tjan³ and Lombardi⁴ also stated proper midline location is necessary for stabilization and produces a desirable effect of cohesiveness or oneness of dental composition.

The purpose of this study is to determine the observable deviation between facial and dental midline and deviation between maxillary and mandibular dental midline in men and women subjects of Jammu region. Null hypothesis states that no difference exists between population of Jammu region when compared for facial and dental midlines and maxillary and mandibular midlines.

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MATERIALS & METHOD

The present study was carried out on 800 patients in Indira Gandhi Govt. Dental College, Jammu. Out of 800 patients, 400 males and 400 females were selected for the study. [TABLE 1] Patients were informed of the objective of the study and a written consent was obtained from each patient.

Patients were instructed to be seated on a dental chair comfortably with head supported and in upright position. Two Photographs were clicked for each patient using Olympus OM-DE-M camera (16.1 MP) and transferred to a computer. The first photograph was in resting position with lips closed where as second photograph was clicked with the patient smiling revealing the midline between two upper central incisors. The photographs were opened using Corel Photoshop Pro and three points were marked on nasion, philtrum and pogonion. All three points were joined by a straight line and evaluated to check the co-relation of facial and dental midline. [FIG 1,2] For evaluation of coinciding maxillary and mandibular midlines, Impressions of each patient were made in irreversible hydrocolloid (Zelgan) and poured in Type III dental stone (Kalabhai). The casts were mounted on a mean value articulator in maximum intercuspation position and evaluated for coincidence. Any deviations in photographs as well as on casts were also noted and analyzed statistically.

RESULT

The data obtained reveals that out of 800 patients, 640 subjects were recorded with a coinciding facial and dental midline, out of which 313 were males and 327 were females. The remaining 160 people which were not having matched facial and dental midline were having deviation to either right (57) or left (103). The data analyzed for coinciding maxillary and mandibular midlines states that 475 out of 800 patients had matched maxillary and mandibular midlines. The remaining 325 patients consist of 157 males and 168 females. Out of 325 patients with deviated midline, 196 cases were deviated to left while 129 were deviated to right. Analysis of variance reveals statistically significant differences between subjects when compared for facial as well as dental midlines. ($P > 0.005$) [TABLE 2,3].

Table 1: Inclusion Criteria.

1. Male and Female of age 18-40 years.
2. No medical history.
3. No history of trauma or any congenital disease.
4. No orthodontic treatment.
5. Absence of any prosthesis.
6. Presence of all the teeth upto 2 nd molar.

Table 2: Analysis of facial and dental midline.

		Total	Male	Female
Number of subjects		800 (100%)	400 (50%)	400 (50%)
Coinciding		640 (80%)	313 (78.2%)	327 (81.7%)
Not coinciding		160 (20%)	87 (54.3%)	73 (45.6%)
Deviated right	to	57 (35.6%)	31 (54.3%)	26 (45.6%)
Deviated left	to	103 (64.3%)	56 (54.3%)	47 (45.6%)

Table 3: Analysis of maxillary and mandibular midline.

		Total	Male	Female
Number of subjects		800 (100%)	400 (50%)	400 (50%)
Coinciding		475 (59.3%)	243 (60.7%)	232 (58%)
Not coinciding		325 (40.62%)	157 (39.2%)	168 (42%)
Deviated right	to	129 (39.6%)	67 (51.9%)	62 (48.06%)
Deviated left	to	196 (60.3%)	90 (45.9%)	106 (54.08%)



Fig 1: Facial Midline analysis (With lips closed in resting state).



Fig 2: Facial dental Midline analysis (With upper central incisors visible).

DISCUSSION

Smile is a key factor contributing to beauty of an individual. Any dental treatment without esthetic consideration is half treatment done. Facial symmetry, midline and proportions forms the backbone of any dental treatment and must be balanced so that to provide a harmonious, healthy smile to patient. Null hypothesis that no difference exists between subjects in terms of coinciding facial and dental midline and maxillary and mandibular midline stands rejected as a significant difference of 20% exists in facial and dental midline and 40.62% in maxillary and mandibular midline respectively.

Inclusion criteria were strictly followed to avoid any false readings. Photographs were used to mark 3 points on the face for marking facial and dental midline as face is a dynamic body and keeps on changing constantly. Also, marking points on face, joining with the straight line and analyzing them was a tiresome practice both for dentist and the subject. Evaluation of maxillary and mandibular midline was carried out on the prepared casts as it helped us to evaluate the direction and amount of deviation which was measured using a ruler and pencil. Also, it was noted, in entire study the patients sitting in dental chairs were extra conscious of their midline mismatches, which could have induced bias in the results leading us to use photographs and casts in our study. The results obtained states that around 80 % of the subjects

tested have a coinciding facial and dental midline. The results of the present study is in accordance to the previous study by Cardash et al.⁵ In a study by Miller,⁶ 66.4% -74.4% of subjects tested had coinciding facial and dental midlines which is in agreement to present study. David R⁷ stated facial midline to be a reliable method for placement of teeth during fabrication of prosthesis. Hickey, Zarb and Bolender⁸ also suggested matching of facial and dental midline as a starting point for the arrangement of teeth. Most of the prosthodontic textbooks^{8,9,10} teach us to match maxillary and mandibular midlines in teeth arrangement which contradicts the results obtained in our study as 40.62 % of subjects had no coinciding maxillary and mandibular midlines. Frush and Fisher¹¹ also suggested dynesthetic interpretation of dentogenic concept which suggests varying the maxillary and mandibular midlines slightly to appear prosthesis look more natural. The studies by Khan F,¹² Sharma V¹³ and Yarladda also carried out similar studies and recorded maxillary and mandibular midline deviations. Another, interesting thing that was observed in this study was that maxillary and mandibular mismatch of 0.5-1mm was unnoticeable in the patient's mouth and can be left as such. The present study was carried out in a single college. Further, studies are directed to carry out the studies at different places with large sample selection. Also, phonetic changes due to different teeth placements can be considered in future studies.

CONCLUSION

The present study suggests us that 80% of Indian population has coinciding facial and maxillary midlines and uses it as a reliable guide to arrange maxillary teeth while fabricating prosthesis. The study further suggests us that a small deviation of 0.5-1 mm in mandibular midline can be left as such and used to provide more lifelike appearance to the prosthesis. Photographs of the patient should be recorded in the diagnostic visit only and midline matching should be carried out at photographs only avoiding any chances of false mismatch.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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