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Comparative Evaluation of Facial Soft Tissue Characteristics Between Angle's Class II Division 1 and Class II Division 2 Malocclusion by Using Photographic Measurements

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ABSTRACT

Aim

To evaluate facial soft tissue characteristics between Angle's class II division 1 and class II division 2 malocclusion by using photographic measurements.

Objective

To evaluate & compare facial soft tissue characteristics by between Angle's class II div 1 malocclusion and class II div 2 malocclusion by photographic measurements.

Materials and Methods

A total of 100 orthodontic patient's standard photographs with age ranging from 15 to 25 procured for all subjects in natural head position (NHP) with maximum intercuspation and lip rest. Among of which 50 are of subjects with class II div 1 malocclusion and 50 are of subjects with class II div 2 malocclusion.

Facial landmarks were identified without using any landmark identification mark. It was done to reduce landmark identification bias and observe the inter and intra-observer reliability. The soft tissue landmarks measured on photograph to assess and compare facial soft tissue parameters.

Result

It was observed that the F-value and p-value indicate the significance of the differences observed between the two divisions for each parameter. The Lower Lip-Me parameter shows a significant difference between the divisions ($p \leq 0.05$*). Also Length-Vermilion, Ag-Ag, and Pro-Lip show significant differences between the divisions ($p \leq 0.05$*).

Conclusion

The comparison of Angle's class II div 1 and class II div 2 malocclusion using photographic analysis could be utilized with precision for orthodontic diagnosis in case of unavailability of cephalometric equipment's.

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KEYWORDS: *Photographic analysis, soft tissue characteristics, Facial landmarks, Angle's class II div 1 malocclusion, Angle's class II div 2 malocclusion*

INTRODUCTION

The face is one of our most important possessions. It has been called "the organ of emotion" and, indeed, the face provides vital clues to our own feelings and those of the people around us.[1] While the face is said to be the organ of emotion, it is an important channel of our identity.

A proportionate relationship between the different structures of face is key to its esthetics and pleasing appearance.

Human malocclusion is a disarrangement of dento-craniofacial development, including dental, skeletal, and soft tissues, which may lead to a distorted facial

appearance, a limited masticatory function, an increased risk for dental trauma, and a compromised quality of life.[2] A multifactorial malocclusion a etiology has generally been assumed, with both genetic and environmental contributions such as ethnicity, functional, also pathologic condition has a role in the variability of dento craniofacial growth and development.[3]The demand for orthodontic treatment is increasing in most of the countries including India. Therefore, rational planning of orthodontic preventive measures on population basis is essential,[4]for which a comparative study between different classes of malocclusion is necessary. In this study we have taken class II div 1 and class II div 2 into consideration.

In a developing country like India, where expensive cephalometric apparatus is unavailable everywhere, photography assumes importance for diagnostic and treatment planning procedures as it is low cost and less technique sensitive.[5] The standard frontal photographs with natural head position (NHP) with maximum intercuspation and lip at rest will be considered.

This comparative photographic analysis could be utilized with precision for orthodontic diagnosis.

Methodology

This comparative prospective two-group study include 100 Subjects with age ranging from 15 to 25 years and standard photographs procured for all subjects in natural head position (NHP) with maximum intercuspation and lip rest. Out of which 50 subject are of class II div 1 malocclusion and 50 subjects are of class II div 2 malocclusion comparing following soft tissue parameters:

- Thickness of lip
- Width of lip
- Nasion to menton
- Subnasal to menton.
- Facial Profile

Study design: This is a cross-sectional, retrospective, in vitro study.

Study setting: The study was conducted in the department of Orthodontics and Dentofacial orthopaedics by using standard photographs of patients who have already reported to the department.

Study population: The study population include subjects already reported to department of Orthodontics and Dentofacial orthopaedics for Orthodontic treatment. Facial photographs were obtained of 100 Subjects of which 50 are of subjects with class II div 1 malocclusion and 50 are of subjects with class II div 2 malocclusion in natural head position and age ranging between 15-25 Years.

Sample size: 100 subjects

Sampling Technique: The sampling technique selected is purposive sampling technique.

Photographic procedure: Standardized frontal photographs of subjects were taken in natural head position (NHP) with maximum intercuspation and lip rest. The photographic room was designed such that the distance between the photographer and the subject was 5 feet.

To achieve NHP, the patient was asked to look straight in front of the camera to obtain "Orthoposition".

Facial landmarks were identified without using any landmark identification mark. It was done to reduce landmark identification bias and observe the inter and intra-observer reliability. The soft tissue landmarks which were used in study are described as under.

Sr. no	Soft tissue landmark	Abbreviation
1.	Ala	**Al**
2.	Antegonial notch	**Ag**
3.	Endocanthion	**En**
4.	Exocanthion	**Ex**
5.	Soft tissue Menton	**Me**
6.	Soft tissue Nasion	**N**
7.	Soft tissue Orbitale	**Or**
8.	Subnasal	**Sn**
9.	Zygoma	**Zyg**

Direct facial measurements: Facial landmarks were palpated manually.

PROCESS OF SAMPLING:

Method of selection of study design:

- **Inclusion:**
- Facial photographs of class II div 1 malocclusion
- Facial photographs of class II div 2 malocclusion
- Age ranging from: 15-25 years

- **Exclusion:** Previous Orthodontic treatment
- Facial asymmetry
- Craniofacial anomaly

History of fracture and surgery of craniofacial region.

Statistical analysis:

SPSS:- Statistical analysis will be performed using Statistical Product and service solution (SPSS) version 16 for Windows (SPSS Inc, Chicago, IL).

Mean 4 SD

Unpaired't' test

Formula:

N=2 S2$\frac{(Z1+Z2)^2}{(M1-M2)^2}$

M1:- Mean test intervention

M2:- Mean control intervention
S1:- Standard deviation of M1
S2 :-Standard deviation of M2
S:- Pooled SD
1-α: - Set level of confidence .Usual values 0.95; 0.99
1-β: - Set level of power test. Usual value 0.8, 0.9
Z1 :- Z value associated with α** 1.64
Z2:- Z value associated with β 0.84
n1:- Minimum sample size

Result

These tables present intergroup comparisons between Class II Division 1 and Division 2 for various parameters related to occlusion and facial features.

Table 1 Intergroup comparison between Class II Division 1 and Class II Division 2 for various parameters

Parameters	Occlusion	N	Mean	Std. Deviation	F-value	p-Value
Na-Me	Class II-Div1	50	67.5400	10.11205	1.21	0.02*
	Class II-Div 2	50	72.3600	10.83976		
Sn-Me	Class II-Div1	50	37.2200	10.01894	1.60	0.78
	Class II-Div 2	50	37.6800	6.60995		
Lower Lip-Me	Class II-Div1	50	16.1000	3.11841	5.83	0.01*
	Class II-Div 2	50	19.1600	2.72074		

Test applied Independent t Test
Level of significance p≤0.05*

Table 1 shows comparisons for parameters including Na-Me (nasion to menton distance), Sn-Me (subnasale to menton distance), and Lower Lip-Me (lower lip to menton distance). The F-value and p-value indicate the significance of the differences observed between the two divisions for each parameter. The LowerLip-Me parameter shows a significant difference between the divisions ($p \leq 0.05$*).

Table 2 Intergroup comparison between Class II Division 1 and Class II Division 2 for various parameters

Parameters	Occlusion	N	Mean	Std. Deviation	F-Value	p-Value
Length_Vermilion	Class II-Div1	50	28.8000	5.91090	0.02*	2.17
	Class II-Div 2	50	31.1800	4.66725		
Ag-Ag	Class II-Div1	50	44.5600	9.33757	0.01*	0.71
	Class II-Div 2	50	59.6800	8.05957		
Pro-Lip	Class II-Div1	50	3.5400	1.00934	0.01*	0.19
	Class II-Div 2	50	-5.4200	1.16654		

Test applied Independent t Test
Level of significance p≤0.05*

Table 2 compares parameters such as Length-Vermilion (length of the vermilion border), Ag-Ag (angle of the lips), and Pro-Lip (protrusion of the lips). Again, the F-value and p-value demonstrate the significance of the differences between the two divisions for each parameter. In this table, Length-Vermilion, Ag-Ag, and Pro-Lip show significant differences between the divisions ($p \leq 0.05$*).

In summary, these tables provide statistical evidence of differences in various facial parameters between Class II Division 1 and Division 2 malocclusions.

Discussion

The pursuit of improving soft tissue aesthetics in orthodontics is pivotal for enhancing the overall facial harmony of patients undergoing treatment. This study contributes to the body of research aimed at understanding the intricate relationship between dental, skeletal, and soft tissue structures, which collectively influence facial appearance and function.

The study employs a comparative prospective two-group design, focusing on Angle's Class II div 1 and Class II div 2 malocclusions. Utilizing standardized frontal photographs with natural head position, the research aims to evaluate various soft tissue parameters, including lip thickness, width, nasion to menton distance, subnasal to menton distance, and facial profile.

The findings of the study highlight significant differences in various soft tissue parameters between Class II div 1 and Class II div 2 malocclusions. Parameters such as lower lip to menton distance, length of the vermilion border, and angle of the lips exhibit notable distinctions between the two

malocclusion types. These differences underscore the importance of considering soft tissue characteristics alongside skeletal and dental features in orthodontic diagnosis and treatment planning.

The study emphasizes the utility of photographic analysis as a cost-effective and less technique-sensitive alternative to cephalometric imaging, particularly in regions where advanced imaging equipment may not be readily available. By leveraging standardized frontal photographs, orthodontists can obtain valuable insights into facial soft tissue dynamics, facilitating accurate diagnosis and treatment decision-making.

While the study contributes valuable insights into soft tissue characteristics associated with different malocclusions, it is not without limitations. The reliance on photographic analysis may restrict the scope of detailed anatomical assessment compared to cephalometric imaging. Future research could explore longitudinal changes in soft tissue parameters following orthodontic treatment interventions and investigate the correlation between soft tissue changes and patient-reported outcomes, such as satisfaction with facial aesthetics and functional improvements.

In summary, this study underscores the importance of evaluating facial soft tissue characteristics in orthodontic diagnosis and treatment planning. By leveraging photographic analysis, orthodontists can enhance their understanding of soft tissue dynamics and optimize treatment outcomes to achieve harmonious facial aesthetics for their patients.

Conclusion

The comparison of Angle's class II div 1 and class II div 2 malocclusion using photographic analysis could be utilized with precision for orthodontic diagnosis in case of unavailability of cephalometric equipment's.

References

[1] Emotions, Identities and Masks-Dane Archer, Berkely Media LLC.

[2] Moreno Uribe LM, Miller SF. Genetics of the dentofacial variation in human malocclusion. Orthod Craniofac Res. 18(Suppl 1):91–9.

[3] Proffit WR, Fields HW, Sarver DM. Contemporary Orthodontics. St. Louis: Mosby Elsevier; 2007.

[4] Prashant Mishra et alPrevalence of Different Types Of Malocclusion In Young Adults, In Ahmednagar District, Maharashtra (According To Angle's Classification)Pravara Med Rev 2018;10(1)

[5] Patel DP, Trivedi R. Photography versus lateral cephalogram: role in facial diagnosis. Indian J Dent Res. 2013 Sep-Oct;24(5):587-92.