e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2024; 16(1); 29-38

Original Research Article

Comparative Evaluation of Skeletal and Dento-Alveolar Features of Deep Bite Malocclusion in Different Facial Growth Patterns

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Received: 01-10-2023 Revised: 15-11-2023 / Accepted: 21-12-2023

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Conflict of interest: Nil

Abstract

Background: Deep bite is one of the most prevalent malocclusions seen in all age groups and is most difficult to treat successfully. Several factors, including genetics, environmental factors, and behavioral ones, might contribute to deep bite. The reasons for deep bite can be divided to skeletal and dentoalveolar contributory factors of deep bite, categorize its incidence in horizontal and normal growth patterns and sorts out prevalence of each the constraints.

Objectives: To evaluate the dental and skeletal features of deep bite and to determine the most and least frequent dental and skeletal contributing factors associated with deep bite malocclusion in horizontal and normal growth pattern.

Methods: The study included a total of 68 (34 in each group) subjects who were divided in the basis of growth pattern including 19 females and 15 males in both the groups with no history of previous orthodontic treatment. The groups were classified according to FMA (group 1included patients with normal growth pattern (FMA =22_27°), while group 2 included patients with horizontal growth (FMA =<22°). The groups were categorized on the basis of the FMA (Group 1included patients with normal growth pattern (FMA = 22-27º) and Group 2 had patients with horizontal growth pattern (FMA= <22º). Pre-treatment lateral Cephalograms and orthodontic models were used to evaluate various dental and skeletal parameters. Nemoceph software was used to take the linear and angular measurements from radiographs. Descriptive statistics is used for statistical analysis. Pearson correlation coefficient was used to analyze various research data.

Results: Considering the dental components, Deep curve of Spee was most frequently associated with deep bite in both normal and horizontal growers. In horizontal growers, retroclination of upper and lower incisors, increased crown length of upper and lower incisors. Supra eruption of upper incisors, infra eruption of upper and lower posteriors follows the frequency curve in contribution to deep bite. In normal growers, supra eruption of upper and lower incisors, increased crown length of lower incisors, retroclination of upper and lower incisors contribute to the deep bite after exaggerated curve of spee. Posterior teeth angulations were the least contributory to deep bite when considering dental factors. Among skeletal components contributing to deep overbite, reduced gonial angle was the most commonly found factor in horizontal growers followed by clockwise rotation of maxillary plane.

Conclusions: Reduced gonial angle is the most common skeletal element, while deep curve of Spee is the most common dental etiological component in deep bite. In general, Normal growers show more dental deep bite while horizontal growers show skeletal deep bite.

Keywords: Deep Bite; Growth Patterns; Curve of Spee, Bisecting Occlusal Plane.

Introduction

Vertical malocclusion develops by interaction of a number of etiological factors during or after the active growth period. The factors that contribute may include skeletal growth of either or both maxilla and mandible, functional variations of intraoral and extraoral musculature, dentoalveoloar development including eruption of teeth etc. The challenging nature of a vertical discrepancy mustn't be restricted to the treatment mechanics alone. Instead, an orthodontist should clearly know the multiple factors behind this type of malocclusion, including the components that contribute to the treatment planning and appliance selection. Identifying deep bite features in various face growth patterns in different groups can help us determine the resources and labor required for a certain population/area. Given that the etiology of deep bite malocclusion varies by demographic data, the current study was conducted to determine the incidence of various etiological characteristics associated with deep bite malocclusion in horizontal and normal growth patterns in our local south Indian community.

The accumulated data will be beneficial for comparing the findings of the current study against those from different populations. Recent years have seen a relatively limited amount of multicentric studies on the topic of the role of etiological factors in the various facial patterns of deep bite malocclusion in the Dravidian population. The results of the current research can be used to estimate resources, organize public health-related missions, and provide information on deep bite malocclusion. It will strengthen the development of deep malocclusion management and prevention strategies. It will further encourage the development of deep bite malocclusion management and prevention strategies.

Materials and Methods

A total of 68 participants, 19 females and 15 males, who had never undergone orthodontic treatment previously, were split into two groups based on their growth patterns for the study. The groups were categorised on the basis of the FMA (Group 1: patients with normal growth Pattern (FMA = 22-27º); Group 2: patients with horizontal growth Pattern (FMA= <22º). Pre-treatment lateral cephalograms and orthodontic models were used to evaluate various dental and skeletal parameters. Nemoceph software is used to take the linear and angular measurements from radiographs.

Inclusion Criteria: Deep bite greater than 5 mm, complete second molar eruption, without a history of prior orthodontic treatment, lack of major craniofacial abnormalities, no supernumerary or missing teeth. Patients aged 14 to 30 who are of both sexes.

Exclusion Criteria: Presence of one or more deciduous teeth, Presence of impacted teeth except 3rd molars, Overbite less than 5mm, any contraindication for radiographic exposure.

Results

The pre-treatment radiographs of 167 patients (who are having deep overbite) were evaluated based on the inclusion criteria and 68 were selected (34 in each group). Both normal and horizontal growth pattern groups had 15 males and 19 females to count. The Nemoceph® software was used to measure the angular and linear measurements from lateral cephalometric radiographs. Results were tabulated on Microsoft excel and statistical evaluation was done. The statistical calculations were performed using the software SPSS for windows (statistical presentation system software, SPSS Inc.1999, New York) version 19.

The statistical analysis of the measurements revealed the following findings: When comparing normal with horizontal growth pattern group, the Ar-Go-Gn (gonial angle) was found significantly less (117.9) in group 2. Another difference was regarding the upper incisor angulation to S-N plane. In group 1, S-N incisor angulation found more obtuse than the same in group 2 suggestive of more class II division 2 pattern in horizontal growers. The Curve of spee seen deep in both the groups with a mean of 3.79 and 3.74 respectively in group 1 & 2.

The correlations of skeletal and dental parameters associated with deep bite were performed using Pearson correlation. Only the gonial angle had a significant negative association (P=0.018) with deep bite, implying that a decrease in gonial angle (in the event of a severe horizontal growth) increases the degree of deep bite.

Among the dental cephelometric angular measurements, upper incisor to Sn plane angulation (p=0.012, 0.0141) and lower incisor to mandibular plane angulation shows significant negative correlation meaning that the upper and lower teeth become more upright or retroclined with the increase in overbite. The dental cephelometric linear measurements seem contributory to deep bite malocclusion in both growth patterns.

The maxillary and mandibular anterior alveolar base heights had a substantial correlation with the bite (P= 0.004, P= 0.033), suggesting that an increase in anterior maxillomandibular alveolar base height (over eruption) will lead to severity in bite. In contrast, the maxillary and mandibular posterior alveolar base heights revealed a negative association (P=0.039, P=0.015), which could be indicative of posterior under eruption leading to bite deepening or vice versa.

Curve of Spee (P=.038), (P= 0.022) were found to be strongly associated with deep bite in both normal and horizontal growth patterns, implying that as the curve of spee increases, so will the bite.

The remaining dental components were found to be only weakly associated to deep bite.

In normal growth pattern, dental components seem to be more contributory than the skeletal ones. Among the dental components, an exaggerated Spee curve contributed the most to deep bite malocclusion (73.53%), followed by maxillary incisor suprareruption (58.82%), mandibular incisor supraeruption (50%), mandibular posterior segment infraeruption (47.06%), maxillary buccal segment infraeruption (44.12%), increased clinical crown dimension of mandibular incisors and retroclined maxillary incisors (41.18%), and retroclined mandibular incisors and crown length dimension of maxillary incisors(38.24%), and the least contributing factor was the posterior teeth angulations(<30%).

In horizontal growth pattern, both dental and skeletal components seem to have significant contribution. One of the bestowed factors for deep bite malocclusion is decreased gonial angle (79.41%), subsequently by a clockwise rotation of the maxillary plane (61.76%) amongst the skeletal components. On remark to the dental components, an exaggerated Spee curve added the most to deep bite malocclusion (85.29%), tailed by retroclination of the mandibular incisors (55.88%) and suprareruption of the maxillary incisors (52.94%), infraeruption of the mandibular posterior segment (50%), infraeruption of the maxillary buccal segment (44.12%), the increased clinical crown length dimension of the mandibular incisors, retroclination of the maxillary incisors (38.24%), crown length of maxillary incisors (32.35%), and retroclination of mandibular incisors (26.47%).

When evaluating the posterior teeth angulations in horizontal and normal growth pattern, the maxillary premolar angulations with palatal plane in horizontal growth pattern is more when compared to the same in individuals with normal growth pattern which may be due to clockwise rotation of maxilla in case of horizontal growers.

Mandibular premolar and molar angulations to mandibular plane is also higher in horizontal plane which may be an indicating upward rotation of mandible in deep bite individuals especially in low angle cases. Maxillary and mandibular posterior teeth show more distal angulations in relation to bisecting occlusal plane in case of horizontal growers when compared with normal growers.

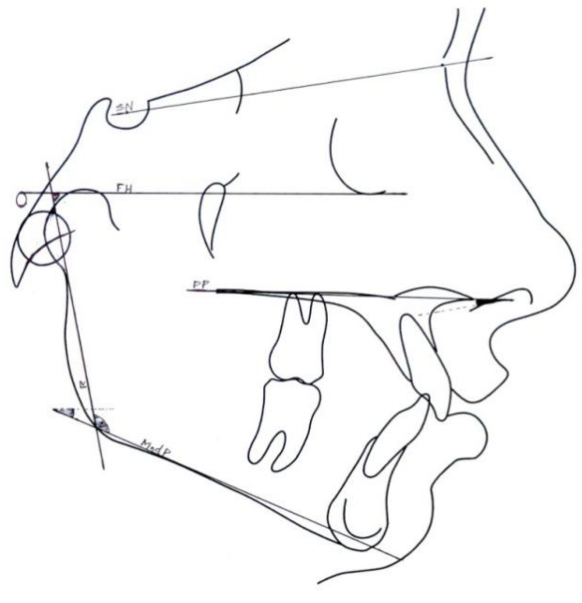

Figure 1: Skeletal cephelometric angular measurements

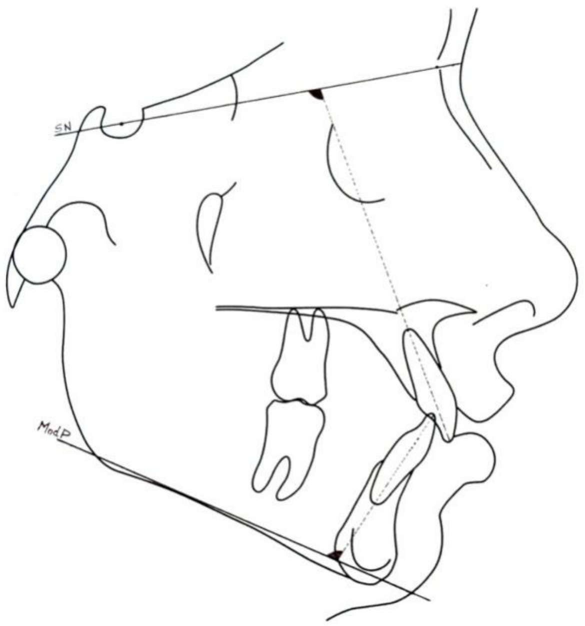

Figure 2: Dental cephelometric angular measurements

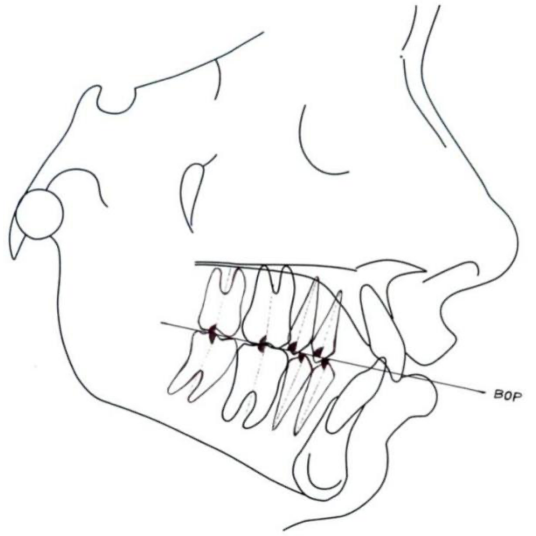

Figure 3: Posterior teeth angulations to BOP

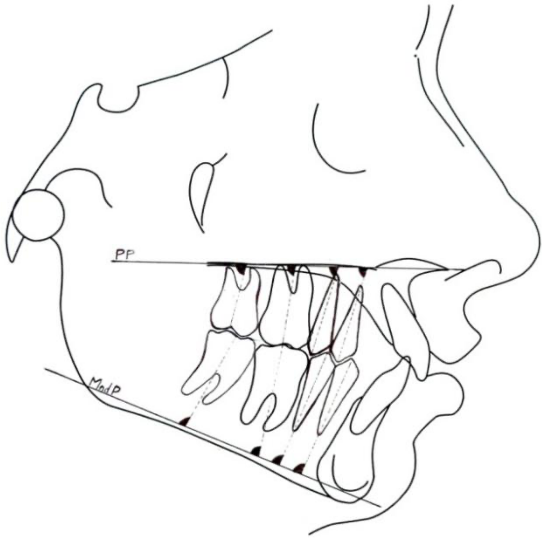

Figure 4: Posterior teeth angulations to palatal and mandibular plane

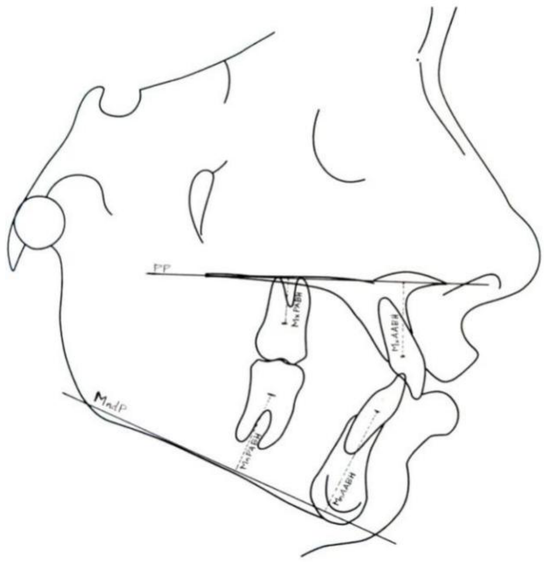

Figure 5: Dental cephelometric linear measurements

Table 1: The means, standard deviations, and coefficient of variation of the dental and skeletal components of deep overbite

Variable	Group I (Normal growth pattern FMA=22-27°(n=34)			Group II (Horizontal growth pattern FMA= <22 °(n=34)			p
	Mean	SD	Coe. of variation	Mean	SD	Coe. of variation	
Sn-Mxp	7.68	1.35	17.58%	6.37	1.42	22.29%	<0.001
MndP-FH	23.84	1.51	6.33%	15.35	3.13	20.39%	<0.001
Ar-Go-Me	122.71	1.68	1.37%	117.94	2.85	2.42%	<0.001
FH/RFH	78.53	3.21	4.09%	76.47	4.48	5.86%	0.033
UI/SN	113.59	3.23	2.84%	107.38	2.45	2.28%	<0.001
LI/MP	98.26	3	3.05%	104.29	3.81	3.65%	<0.001
Mx 1PM/BOP	88.18	3.12	3.54%	79.53	5.82	7.32%	<0.001
Mx 2 pm/BOP	88.79	3.45	3.89%	83.35	4.16	4.99%	<0.001
Mx 1M/BOP	86.53	6.37	7.36%	89.68	3.38	3.77%	0.013
Mx 2M/BOP	88.56	3.39	3.83%	91.5	3.6	3.93%	0.001
Mnd 1PM /BOP	87.21	3.57	4.09%	83.62	4.11	4.92%	<0.001
Mnd 2PM /BOP	85.21	4.33	5.08%	90.06	4.31	4.79%	<0.001
Mnd 1M /BOP	84.85	5.12	6.03%	83.97	3.07	3.66%	0.392

Mnd 2M /BOP	83	5.14	6.19%	78.29	3.66	4.67%	<0.001
Mx 1PM /PP	84.62	3.76	4.44%	89.35	3.61	4.04%	<0.001
Mx 2PM/PP	82.47	4.45	5.40%	86.82	3.9	4.49%	<0.001
Mx 1M /PP	80.59	4.62	5.73%	82.32	4.62	5.61%	0.126
Mx 2M /PP	78.56	5.4	6.87%	78.85	5.26	6.67%	0.821
Mnd 1PM /MndP	89.32	3.37	3.77%	83.12	3.06	3.68%	<0.001
Mnd 2PM /MndP	91.21	3.67	4.02%	81.5	2.9	3.56%	<0.001
Mnd 1M /MndP	93.62	3.82	4.08%	84.18	2.78	3.30%	<0.001
Mnd 2M /MndP	95.5	4.36	4.57%	85.74	3.41	3.98%	<0.001
MxAABH	19.85	2.2	11.08%	18.16	1.81	9.97%	0.001
MnAABH	27.12	1.87	6.90%	28.47	2.03	7.13%	0.006
MnPABH	22.32	2.23	9.99%	21.32	1.93	9.05%	0.052
MxPABH	17.06	2	11.72%	15.88	1.55	9.76%	0.009
CL Mx CI	10.15	0.7	6.90%	10.41	0.54	5.19%	0.087
CL Mnd CI	8.82	0.87	9.86%	9.4	0.49	5.21%	0.001
COS	3.79	1.43	37.73%	3.74	1.21	32.35%	0.856

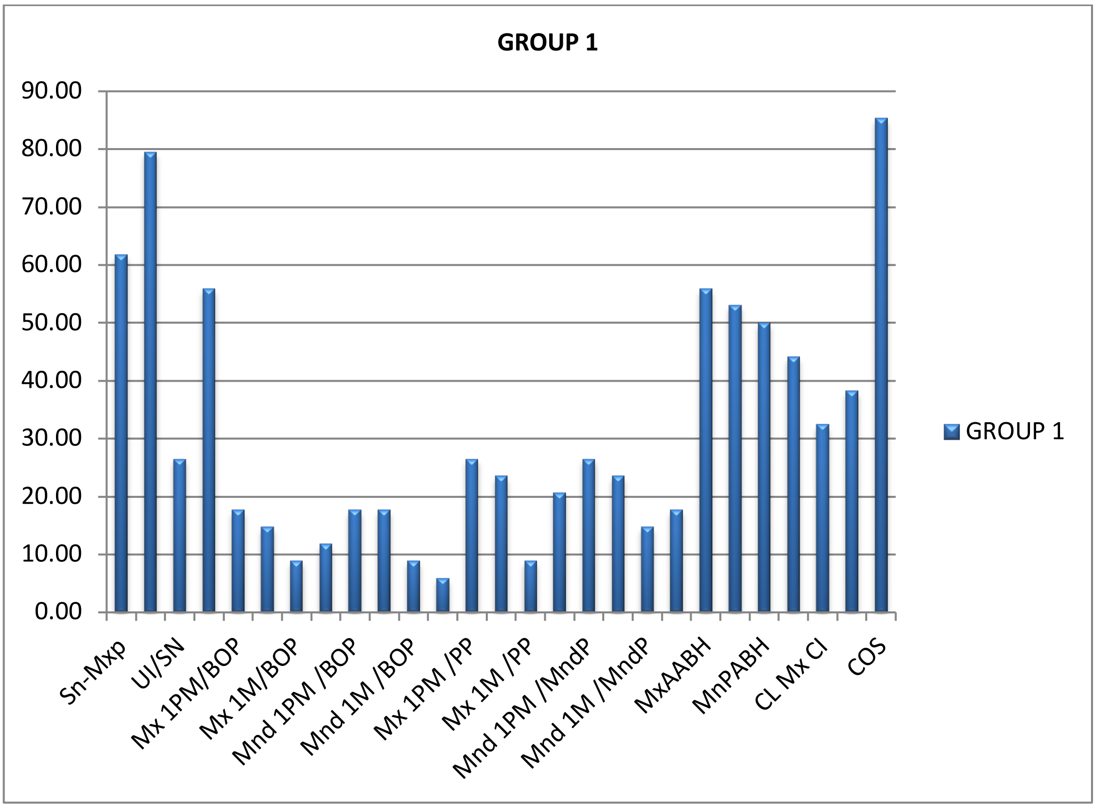

Chart 1: Percentage of contribution of different components in normal growth pattern

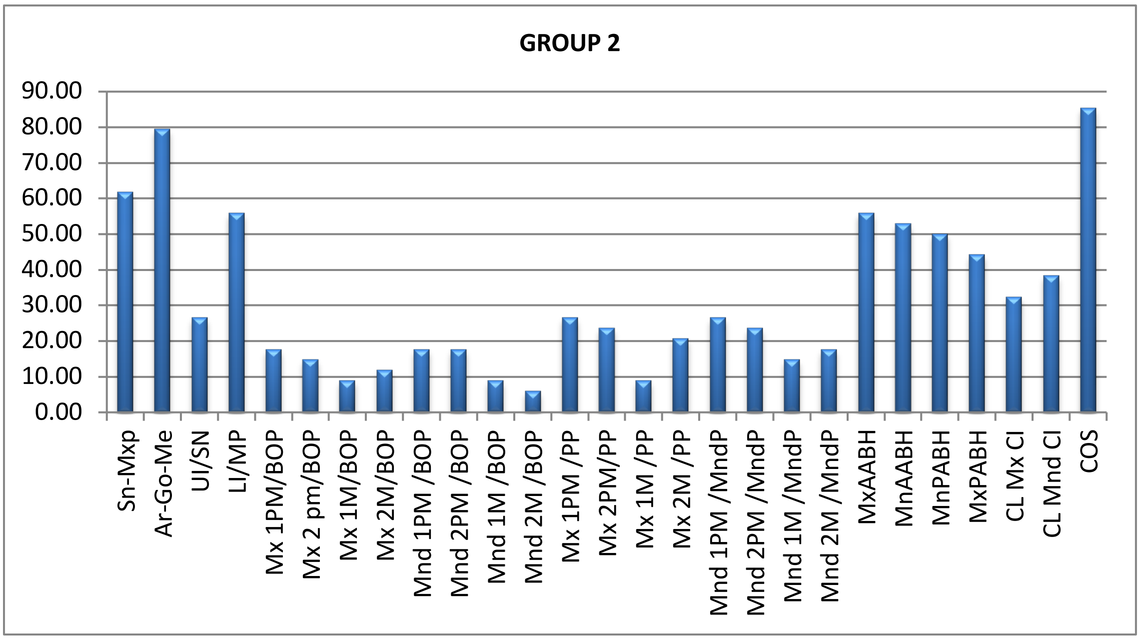

Chart 2: Percentage of contribution of different components in horizontal growth pattern

Table 2: Skeletal cephalometric measurements

Correlation with overbite	Group I		Group II	
	r	p	r	p
Sn-Mxp	0.012	0.948	0.062	0.727
MndP-FH	0.163	0.357	0.115	0.518
Ar-Go-Me	0.031	0.001*	-0.076	0.018
FH/RFH	0.18	0.309	0.035	0.844

Table 3: Dental Cephelometric Angular Measurements

Correlation with overbite	Group I		Group II	
	r	p	r	p
UI/SN	-0.004	0.982	-0.258	0.141
LI/MP	-0.049	0.785	-0.048	0.789
Mx 1PM/BOP	.002	0.992	.055	.756
Mx 2 pm/BOP	0.295	0.090	-.041	.820
Mx 1M/BOP	-0.052	0.772	-.005	.977
Mx 2M/BOP	.357*	.038	.266	.129
Mnd 1PM /BOP	.096	.587	.087	.625
Mnd 2PM /BOP	.239	.174	.132	.456
Mnd 1M /BOP	.313	.072	.065	.717
Mnd 2M /BOP	-.104	.558	.151	.393
Mx 1PM /PP	-.075	.673	-.028	.875
Mx 2PM/PP	-.165	.353	.093	.601
Mx 1M /PP	.406*	.017	.049	.783
Mx 2M /PP	-.007	.970	-.083	.642
Mnd 1PM /MndP	.111	.533	.074	.680
Mnd 2PM /MndP	-.031	.863	.066	.712
Mnd 1M /MndP	.136	.442	.021	.906
Mnd 2M /MndP	.044	.804	.029	.870
r- Pearson Correlation Coefficient *-<0.05 **<0.01				

Table 4: Dental Cephalometric Linear Measurements

Correlation with overbite	Group I		Group II	
	r	p	r	P
MxAABH	1.272	0.019	1.384	0.055
MnAABH	0.024	0.004	0.038	0.033
MnPABH	0	0.039	-0.178	0.015
MxPABH	-0.107	0.048	-0.024	0.024

Table 5: Dental Cast Measurements

Correlation with Overbite	Group I		Group II	
	r	p	r	P
CL Mx CI	0.138	0.437	0.045	0.046
CL Mnd CI	0.194	0.271	0..136	0.444
COS	0.003	0.038	0.142	0.022

Discussion

Deep bite is characterized by vertical overlapping of upper incisors over the lower incisors by 2-3 mm. A deep bite malocclusion is a clinical manifestation of numerous underlying skeletal and dental anomalies. The examination of such skeletal and dental parameters aids in the design of efficient deep bite correction mechanics. Successfully managing deep bite is challenging.[1] A clinician can better provide treatment with reduced recurrence by having an in-depth comprehension of the dental and skeletal characteristics of patients with deep bite. According to Christopher et al.'s [2] study on the impact of incisor angulation on overbite, came to a conclusion that altering the maxillary incisors inclination directly impacts the degree of overbite. The inclination of the maxillary incisors and the amount of overbite shows a negative correlation. A decrease of 6° in inclination of maxillary incisors will result in a 0.3-mm increase in overbite. Thus, increasing the inclination of incisors can be used as a method to open the bite.

The primary objective of this study was to identify the most and least effective contributing factors generating deep bite and to compare the skeletal and dentoalveolar characteristics of deep bite in patients with normal and horizontal growth patterns. The current cross-sectional study, which included 68 untreated individuals aged 16 to 30 years, was done following institutional approval to investigate the frequency and pattern of deep bite malocclusion. For normal growers, the sample mean age was 18, whereas for horizontal growers, it was 19.

Claro et al [3] examined 86 cephalograms to determine the impact of overbite on facial growth patterns. Their results corroborated that that there was no relationship between overbite and face growth pattern, and that deep bite might occur in any growth pattern.

Cases were chosen from the patient records from the Orthodontic Department based on selection criteria for the current cross-sectional study. All subjects in the sample were to have had no previous surgery or orthodontic treatment, as this could alter occlusion.

A transient or temporary deep bite might result from the failure of posterior teeth to fully emerge. As a result, the subjects chosen for this study ranged in age from 16 to 30 years. This was done to ensure full eruption of the second molars, as well as the accuracy of the assessment of the anterior deep bite. However, Lauc[4] (2003) examined the prevalence of malocclusion in a sample of children aged 7-14 years and discovered that 51.8 percent of the children have a deep overbite.

In the current study, both genders were included in the groups based on the gender criterion. Mohamed Abuelazayem et al[5] discovered that there was no difference in the prevalence of deep bite between men and females, as well as no variation in the existence of distinct skeletal patterns between males and females with deep overbite. This backed up the gender criteria used in this investigation.

Ceylan and Eroz[6] in 2001 evaluated the effect overbite in maxillary and mandibular teeth morphology and concluded that there are statistically significant morphological differences among normal overbite, edge to edge bite, open bite and deep bite groups. Baydas et al[7] investigated the relationship between incisor positions, overjet, overbite, lower anterior crowding, and depth of curve of Spee and discovered that incisal angulations are not significantly influenced by Spee depth, whereas overbite increases with the deepening Spee. The current study aimed to evaluate the multiple skeletal and dental components of deep bite, as well as investigate their frequencies and correlate the investigated elements.

Several previous studies [6,8,9,10] reported the gonial angle as a presiding feature in deep bite malocclusion. In the present study also, reduced gonial angle seem to be the most frequent skeletal factor contributing to deep bite among the other investigated factors.

Marshall et al [11] found in their study that an inflated Spee curve plays a significant role in the development of deep bite. Similarly, in the current investigation, the elevated spee curve had the greatest influence among all etiological factors in both groups. This emphasizes the significance of levelling the Curve of spee for deep bite repair.

The finding that exaggerated curve of spee contribute the highest towards deep bite has been supported by many authors. Trauten et al[12] identified the reverse Spee curve in open bite cases and the deep Spee curve in deep bite cases as the most important contributing factors. According to Rohit Kulshrestha et al[13]'s research, as the overbite grows, so does the depth of the Spee curve. These findings were validated by Alqubandi[14] and Lie F[15] studies, which showed that overbite measurements in the deep Spee group were substantially bigger than in the normal and flat Spee groups. According to Kuitert[16] the most notable variance for overbite was identified between the flat and deep Spee groups. An increased overbite can be a manifestation of excessive curve of Spee; in the same way, an exaggerated curve of Spee can be preceded by a deep overbite. These findings highlight the significance of the mandibular dento-alveolar component in deepbite malocclusions, emphasizing the relevance of extruding the mandibular posterior segment and intruding the mandibular incisors during deep overbite therapy. Every 1 mm of posterior extrusion widens the bite anteriorly by 1.5-2.5mm,[17] implying that even minor quantities of molar extrusion can result in considerable anterior bite opening.

In groups 1 and 2, there was a statistically significant positive association between the upper and lower anterior dentoalveolar heights (r = 1.272 p = 0.019 and r = 1.384 p = 0.055). It indicates the significant contribution of supraeruption of incisors in the occurrence of deep bite in both norm divergent and hypo divergent patients. This value support with those of El Dawlatly et al.[18] This finding confirms the importance of anterior intrusion in correction of deep overbite malocclusion while considering other factors. The study by Beckmann et al.[19] that indicated that deep bite patients have higher maxillary and mandibular basal heights than normal or open bite cases further supports this theory.

In horizontal growers, deep bite is influenced by numerous skeletal and dental factors. The curvature of spee, which is identical to normal growers, made the largest contribution.

Reduced gonial angle was shown to be the most important skeletal element in horizontal growers that contributed to deep bite, which was consistent with the findings of El-Dawlatly et al.'s study[18] that gonial angle was the most shared skeletal feature in deep bite malocclusion. It is an indicator of the upward and forward rotation of mandibular plane in deep bite individuals. Thus, it is favorable to erupt the posterior teeth in horizontal growers to correct the deep bite while considering other factors.

This study concluded that lower incisor over eruption and maxillary posterior under eruption lead to deep bite malocclusion in both norm divergent and hypo divergent groups, which is corroborated by Beckmann et al[19] Burstone[20] validates incisor intrusion as the best approach for deep bite therapy. The level of intrusion is determined by a variety of parameters in order to avoid negative effects on esthetics and function. In his study, Zachrisson[21] stated that the treatment plan for any vertical malocclusion must depend on the level of visibility of the upper incisors on grin and at rest, and that excessive incisor show can be best corrected with upper anterior intrusion. Extruding posterior teeth or intruding lower front teeth will be more suitable for patients with average or diminished incisor visibility. Another factor that determines the individualized treatment plan of patients with deep bite malocclusion is the smile arc. Intrusion of the upper front teeth is not recommended for subjects presenting with flat or reverse smile arc.

To analyze the effect of incisor location on overbite, mean values for U1-PP and L1-MP angles were calculated. In groups 2 and 1, reduced L1-MP angles were detected in 55.88% and 38.24%, respectively. Reduced U1-PP angles were found in 41.18% and 26.47%, in group 1 and 2 respectively. Sangcharearn and Christopher [22] investigated the influence of incisor angulation on overjet and overbite in class II camouflage treatment and determined that the inclination of maxillary anterior teeth and the amount of overbite had a negative link. They discovered that a 6 degree decrease in inclination results in a 0.3 mm increase in overbite.

Supporting their finding, the retroclination of the upper and lower incisors had shown high contribution to deep bite malocclusions in both normal and horizontal growth patterns. When evaluating each group separately, the upper incisor retroclination is more common in normal growers and lower incisor retroclination is more common in horizontal growers. Furthermore, the inclination of the maxillary incisors and the amount of overbite were shown to be statistically significant (r= - 0.254, p=0.012 and - 0.158, p=0.041, respectively).

The ramus/Frankfort horizontal angle (FH-RFH) depicts the angulation of the mandibular ramus in relation to the Frankfort horizontal plane. In their investigation of deep bite patients, El-Dawlatly et al[18] found that the mean value of this angle was 82.06°5.54. The mean value of the ramus/Frankfort horizontal angle in this study was determined to be 78.53 in group 1 and 76.47 in group 2, which is slightly less than their reported value. El-Dawlatly et al[18] also revealed that reduced gonial angle was the most frequently observed skeletal component, whereas increased maxillary plane angle was the least frequently observed factor, indicating the role of angulation and expansion of the mandibular ramus in enhancing deep bite compared to maxillary factors. In this regard, the current study's findings were identical to those of their previous study.

The posterior teeth angulations (which is taken as the angulation through long axis of each tooth) to palatal or mandibular plane indicates the angulation of tooth in relation to skeletal plane. Thus, it can change to same direction for all the posteriors only when there is a skeletal rotation present. Whereas if it is varying in different direction for one or more teeth in same quadrant that might be indicating more dental influence than skeletal. However, the tooth angulation to bisecting occlusal plane purely indicates the dental changes rather than skeletal.

When the posterior teeth angulations in deep bite patients are evaluated, mandibular posteriors in horizontal growers with deep bite showed increased distal angulations in relation to mandibular plane, which may indicate the upward and forward rotation of mandible. This is supported by the study done by Badiee et al[23] in 2019 which showed increased distal angulations of posterior teeth in relation to skeletal planes in horizontal growers. Mean angle of all maxillary and mandibular posterior teeth to bisecting occlusal plane show more distal angulations in horizontal growth pattern. This is again similar to the study done by Badiee et al.[23]

When considering the posterior teeth angulations in deep bite individuals as a whole, it is more related with the growth pattern rather than the amount of deep bite present. As we know, palatal and mandibular planes are different in different growth patterns. For instance, in a deep bite patient, the palatal and mandibular planes will be more converging and consequently, the teeth have a more upright or slight backward inclination. In other words, the long axis of teeth has an upright to distal inclination relative to the palatal plane and mandibular plane in deep bite individuals which is more prominent in horizontal growers. The teeth have milder distal inclination or are more upright in normal growers when compared with horizontal growers with deep bite.

In a cephelometric study, Janson et al[24] compared the angulation of posterior teeth in patients with normal occlusion and open bite and concluded that, the maxillary and mandibular premolars had a mesial angulation relative to occlusal plane. When considering this we can say that, as bite is getting deepened, the posterior teeth become more upright and then distally inclined.

Lastly, in the clinical point of view, up righting the teeth in order to open the bite can be considered in deep bite individuals especially with horizontal growth pattern.

Conclusion

Deep bite malocclusion found to be multifactorial in its presentation with contribution of skeletal as well as dento-alvelolar components different from individual to individual. The highest contributing dental element in all facial layouts was a deep curve of Spee. Gonial angle found to be the most contributing skeletal factor to deep overbite malocclusion especially in horizontal growers. The infra eruption of the posterior teeth and the over eruption of the maxillary and mandibular incisors have both demonstrated a major effect in the horizontal growth pattern.

Deep bite was caused by infra occlusion of the posteriors and excessive eruption of the incisors in a typical facial pattern. The angulation of posterior teeth especially molar angulations to bisecting occlusal plane as well as to skeletal base have shown high variability in both the groups. So, this can be considered as the least contributory factors among the parameters measured. A meticulous examination of all deep bite components lowers the clinician's bias toward preset mechanics in treating these patients and allows for more customized treatment and mechanotherapy, which can result in more stable and reliable outcomes.

Key Points

- The treatment modality of deepbite must be individualized based on underlying skeletal and /or dental components to achieve stability of the results.
- Along with these components patient's age, growth status etc. also determines the treatment plan of deep bite.

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