

# EXCESSIVE OVER BITE: FREQUENCY OF LOCAL DENTAL AND SKELETAL FACTORS

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## ABSTRACT

*Deep bite is multifactorial in nature with involvement of many local dental and skeletal factors. The aim of present cross sectional study was to find out the frequency of dental and skeletal factors involved in deep bite subjects visiting department of Orthodontics, Faisalabad Medical University and de'Montmorency College of dentistry. Orthodontic models and lateral cephalograms of 100 deep bite patients were included to find out the frequency of involved dental and skeletal factors. The mean age of the sample was  $20.35 \pm 3.45$  years. Results showed that in dental factors, deepening of Von spee curve was the most frequent dental factor while decreased mandibular plane angle was the most frequent skeletal factor. It was concluded that deep curve of spee was the most frequent dental factor while decreased mandibular plane angle was the most frequent skeletal factor involved in deep bite subjects.*

**Key Words:** Deep bite; Dental; Skeletal.

## INTRODUCTION

Malocclusion can be defined as any deviation from normal occlusion which is unsatisfactory functionally and aesthetically.<sup>1</sup> There are several types of inter-arch malocclusions; one such is deep bite malocclusion. Deep bite is basically increased overlapping of upper and lower incisors in vertical plane.<sup>2</sup> It is one of the malocclusions which are not easy to treat and retain following orthodontic therapy.<sup>3</sup>

Deep bite malocclusion is multifactorial in nature with involvement of many genetic and environmental factors.<sup>4-9</sup> Management of deep bite malocclusion is dependent on diagnosis of etiological factors.

Identifying the dental or skeletal factors involved in deep bite patients can provide us valuable data to rightly allocate resources and manpower needed for management of deep bite malocclusion. Frequency of deep bite malocclusion is found to be different in different populations; the recent study showed the frequency

of deep bite malocclusion in our local population was found out to be 25%.<sup>10</sup>

Very few deep bite studies have been conducted in recent years in Pakistan, on investigation of involved dental and skeletal factors. Research on this particular subject can provide us local data which will help in planning public missions targeting deep bite malocclusion and will also help in rightly allocating resources and manpower needed for management of deep bite malocclusion. It will also add to the local data of dental and skeletal factors involved in deep bite malocclusion.

Therefore, the aim of present study was to find out the frequency of local dental and skeletal factors involved in deep bite subjects visiting department of Orthodontics, Faisalabad Medical University (FMU) and de'Montmorency College of Dentistry (DCD).

## METHODOLOGY

This was a cross-sectional study conducted after institutional ethical board approval and taking informed consent from the patients at the Department of Orthodontics, FMU and DCD from August 2017 to January 2018, in which orthodontic models and lateral cephalograms records of 100 untreated deep bite subjects were assessed to find out the frequency of local dental and skeletal factors. Patients were included adapting non-probability purposive sampling technique.

### Selection Criteria

Following patients were included: Patients having

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good quality treatment records, deep bite > 5mm, all teeth erupted excluding third molars, age range 12-22 years, no prior orthodontic treatment, non-syndrome patients, no history of trauma, and absence of any kind of tooth wear.

### Data Collection Procedure

As per study by El-Dawlatly et al,<sup>11</sup> various cephalometric dental and skeletal parameters and dental model measurements were used in present study to calculate the frequency of skeletal and dental factors of deep bite malocclusion. Linear parameters were calculated by standardized digital vernier callipers (0.01 mm accuracy).

### Statistical Analysis

The data were analyzed using software SPSS version 19.0. The mean age, and gender distribution was calculated. Involved skeletal and dental factors were presented in form on frequency and percentages. For reliability, 20 models and lateral cephalograms were randomly selected and reassessed after 2 weeks. Data were found to be having good reliability.

## RESULTS

The mean age of the selected deep bite sample was  $20.35 \pm 3.45$  years. (Table I)

Out of 100 deep bite subjects, 60% were females and 40% were males. (Table II)

Table III and IV, represents frequency of several dental and skeletal factors involved in deep bite malocclusion. Deepening of Von spee curve was the most frequent involved dental factor while decreased mandibular plane angle was the most frequent skeletal factor. (Table III and IV)

## DISCUSSION

Deep bite malocclusion can be contributed by various

TABLE 1: DESCRIPTIVE STATISTICS OF AGE (YEARS) (N=100)

	N	100
Age (years)	Mean	20.35
	SD	3.45
	Minimum	12
	Maximum	22

TABLE 2: GENDER DISTRIBUTION (N=100)

Parameter	Frequency (%)
Deep bite Patients	100 %
Males having deep bite	(40) 40 %
Females having deep bite	(60) 60 %

TABLE 3: FREQUENCIES OF DENTAL FACTORS IN DEEP BITE SUBJECTS (N=100 DEEP BITE PATIENTS)

Parameter	Percentage (%)
Deep curve of spee	60.3%
Increased upper incisor length	21.3%
Decreased upper incisor inclination to SN plane	11.1%
Decreased lower incisor inclination (IMPA)	3.2%
Decreased lower incisor length	5.1%

TABLE 4: FREQUENCIES OF SKELETAL FACTORS IN DEEP BITE SUBJECTS (N=100 DEEP BITE PATIENTS)

Parameter	Percentage (%)
Decreased gonial angle	55.4%
Decreased mandibular plane angle	23.3%
Increased maxillary plane angle	22.3%

dental and skeletal factors.<sup>12-15</sup> Present cross sectional study was designed to investigate the frequency of local dental and skeletal factors involved in deep bite subjects. Calculation of local dental and skeletal factors helps to choose the best management strategy for deep bite malocclusion. In inclusion criteria we selected patients having deep bite > 5mm, which is similar to the previously conducted study at Agha khan hospital, Karachi.<sup>16</sup>

Results of present study showed that in deep bite patients, increased maxillary plane angle was the least frequent skeletal factor and deepening of Von spee curve was the most frequent dental factor followed by increased coronal length of upper incisors. This is in agreement with findings of studies by Bhateja et al<sup>16</sup> and Marshall et al<sup>17</sup>.

Results of present study revealed that mandibular factors are more commonly involved than the maxillary skeletal factors as it was found that in deep bite patients decreased mandibular plane angle was the most frequent skeletal factor and retroclined lower incisors was the least frequent dental factor. These results are in contrast with findings of El-Dawlatly et al<sup>11</sup> who showed that decreased gonial angle was the most frequent skeletal factor in deep bite patients, and also in contrast with findings of Bhateja et al<sup>16</sup> who showed that decreased crown length of mandibular incisors was the least frequent dental factor in deep bite patients.

There are various management strategies to cor-

rect deep bite, which includes intrusion of incisors, proclinations of lower incisors, and extrusion of posterior teeth.<sup>18-20</sup> Intrusion of lower incisors in growing patients can be achieved by using intrusion arches while in adults it can be achieved without anchorage loss by using skeletal anchorage devices.<sup>21</sup> According to the results of present study in most of the dental deep bite patients in our setup, strategy should be focused on intrusion of lower incisors for correction of curve of spee.

The limitations of present research are its cross sectional nature and small sample size. Further large scale studies are suggested.

## CONCLUSION

A deep curve of spee was the highest contributing dental factor to a deep bite, while decreased mandibular plane angle was highest contributing skeletal factor to a deep bite.

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## CONTRIBUTIONS BY AUTHORS

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|---------------------------|---|
| <b>1 Muhammad Azeem:</b>  | Conception and design study, Manuscript writing |
| <b>2 Amna Tahir:</b>      | Analysis and interpretation of data.            |
| <b>3 Fareena Ghaffar:</b> | Title, abstract, Data analysis and recording.   |