

Prevalence of upper mid line diastema and its effect on esthetic appearance in patients attending dental teaching clinic in Basrah

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ABSTRACT

Background. The presence of a diastema between the teeth is a common feature of the anterior dentition that remains until the completion of the permanent dentition after that if not closed it considered abnormal anomaly with an esthetic impact.

Objective. The aim of this study is to determine the presence of maxillary midline diastema in a group of patients attending the teaching clinic - collage of dentistry university of Basrah particularly prevalence and etiological factors with regard to gender.

Methods. A total of 592 patients aged 10-35 years were randomly selected. Clinical examination was done using simple examination tools including plain mouth mirror, light source and radiographic examination. Patients who underwent orthodontic treatment or prosthodontic restorations in the upper anterior teeth and periodontal disease were not included in the sample.

Results. Readings revealed the prevalence of maxillary midline diastema was 15.2% among the examined patients, male are highly significant and generalized spacing was the most cause of diastema 24.4% in this study followed by genetic factors 23.3% with the least cause attributed to mesiodense 1.1%.

Conclusion. Mid line diastema is multifactorial condition its management need proper examination and may need a team decision.

Key words: mid line diastema, etiology, aesthetic, congenital

2 INTRODUCTION

Diastema in Greek means gap or space between two or more adjacent teeth. Spacing of upper or lower central incisors is commonly known as midline diastema which, presents more frequently on the upper teeth [1].

Mid line diastema can be a normal growth characteristic during the primary and mixed dentition and generally is closed gradually by the time as the maxillary canines emerge to oral cavity [2].

For most children, the medial erupting path of the maxillary lateral incisors and maxillary canines, results in normal closure of this space, however, the diastema does not close spontaneously in some children [3].

Median diastema is caused by many etiological factors like the disproportion between teeth sizes and dental arches length and abnormal labial frenum attachment between central incisors [4, 5]. Furthermore, congenitally missing or extracted incisors or peg-shaped lateral incisors canine impaction are observed [6-8]. Racial differences also exist for diastema, White people are at less risk to have a median diastema than black people [7, 9]. Lavelle and associates reported the prevalence of the maxillary median diastema was greater in Africans (West Africa) than in Caucasians (British) or Mongoloids (Chinese from Hong Kong and Malaya) [9, 10]. Other etiologies associated with diastema include muscular imbalances, oral habits, abnormal maxillary arch structure, physical impediments and various dental anomalies. In addition to systemic diseases e.g. Down syndrome which may associated with midline diastema [11].

Mid line diastema usually located between the upper anterior teeth that remains until the completion of the permanent dentition. Aesthetic and psychological factors are the primary reason for treatment rather than functional requirement. Proper diagnoses and advanced planning enable the identification of the most appropriate treatment to address the needs of each individual patient [12-16].

METHODS

Across sectional study was conducted by examining 928 patients attending the teaching clinics in College of Dentistry-University of Basrah during a period of 3 months. Those were examined randomly to determine the presence and etiology of midline diastema. The age range was between 10 – 35 years old to exclude diastema associated with ugly duckling stage or periodontal disease. All patients with artificial or missing upper anterior teeth, periodontally weak anterior teeth and those with history of orthodontic treatments were also excepted. After the exclusion criteria 592 Patients (346 females, 246 males) were informed about the aim of this study and examined clinically and radiographically with their information recorded in a specially designed chart including their names, ages and the etiological factor of diastema if present. The presence of a visible space between the maxillary central incisors was recorded as a diastema. The causative factors were identified by intraoral and radiographic examination of labial frenum, inter dental spacing, peg shaped maxillary lateral incisors, missing, impacted or malposed canine or central incisor presence of supernumerary teeth and genetic factors also recorded by asking the patient about the presence of diastema in their family members, then those patients showed their opinion regarding effect of midline diastema on the esthetic appearance and the need for treatment in future. The data collected and analyzed statistically using SPSS23 program simple descriptive statistics (percentage and frequency) of mid line diastema were recorded.

RESULTS

The study involved 592 patients including of 246 males and 346 females. The patients were aged between (10-35) years old, with mean age of 22 years. (Table 1, 2)

Table 1: gender distribution

	Frequency	Percent
Male	246	41.6
female	346	58.4
Total	592	100.0

Table 2: Age distribution

Mean	22.08
Std. Deviation	6.678
Minimum	10
Maximum	35

Out of 592 patients who match the selection criteria, 90 patient had midline diastema (table 3).

Table 3: frequency of mid line diastema

Mid line diastema	Frequency	Percent%
absence	502	84.8
presence	90	15.2
Total	592	100.0

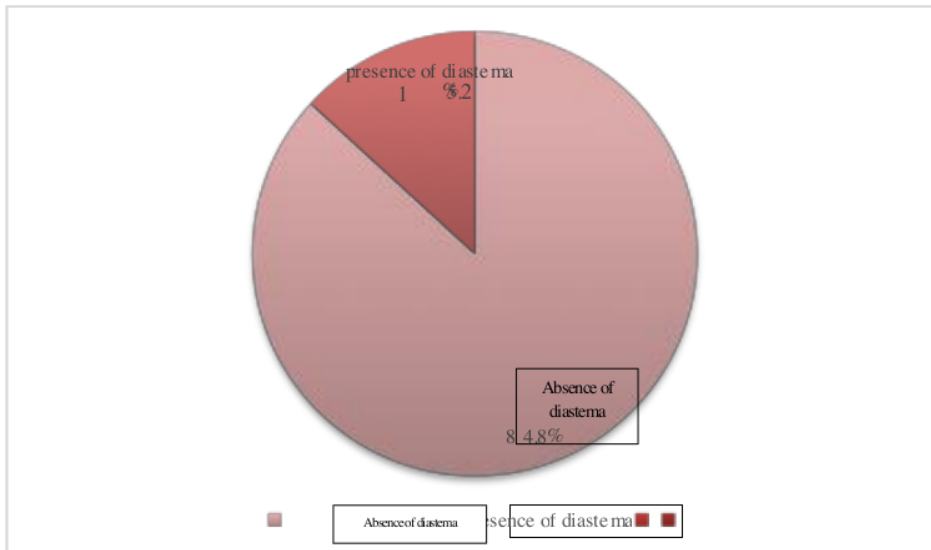


Figure 2: frequency of mid line diastema

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Statistically there is significant difference ($p=0.05$) in the prevalence of midline diastema between male and female (18.3% males, 13% females)

Table 4: Prevalence of midline diastema according to gender

Gender		Presence of diastema		Total
		Absence	Presence	
male	Count	201	45	246
	% within Gender	81.7%	18.3%	100.0%
Female	Count	301	45	346
	% within Gender	87.0%	13%	100.0%
Count		502	90	592

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The results were statistically analyzed and each diagnosed etiological factor for mid line diastema was recorded as a ratio from total number of patients recorded with diastema and expressed in percentage.

Diverse intraoral anomalies were found to be associated with existence of diastema. These were interdental spacing, high frenal attachment, history of oral habits, peg shaped lateral incisor, un erupted canine...etc. All of the included patients with diastema had at least one of the previously mentioned causative factors.

Generalized spacing was the most frequent etiological factor (24.4%) followed by the presence of diastema due to hereditary factor (23.3%) in those group their parents or siblings had the same diastema. There is strong connection between generalized spacing and genetic factor In 15.6 % of patients the reasons behind diastema were high frenal insertion and the 15.6% associated with peg or small lateral incisors.

On the other hand, canine impaction or malposition recorded about (11.1%) of diastema cases. (6.7%) have rotated, impacted or missing central incisor. 3.3% associated with oral habits. Only one case 1.1% from the collected sample had midline diastema caused by mesiodense.

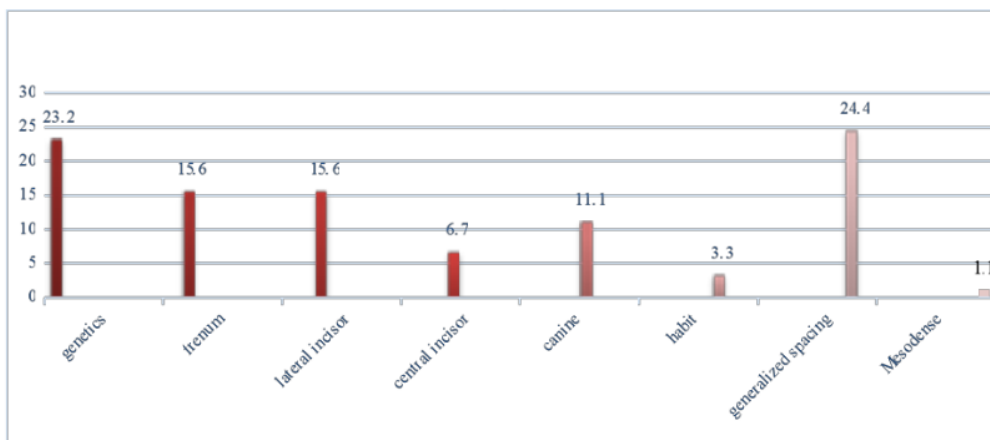


Figure 3: Ratios of etiological factors of diastema

About 51 (56.7%) of effected patient consider diastema as a problem affect their esthetic appearance, while the remaining 39 (43.3 %) patient are satisfied with their appearance (table 5).

Table 5: Effect of midline diastema on esthetic

Esthetic appearance	Not affect the appearance	Affect the appearance	Total
Count	39	51	90
% within presence of diastema	43.3%	56.7%	100.0%
% of Total	6.6%	8.6%	15.2%

On the other hand 49 (54.4%) of midline diastema patients looking to treat this condition and the remaining 41 (45.6%) not willing to close it. (Table 6)

Table 6: percentage according to the desire to treat midline diastema

Treatment	Not want treatment	Want treatment	Total
Count	41	49	90
% within presence of diastema	45.6%	54.4%	100.0%
% of Total	6.9%	8.3%	15.2%

DISCUSSION

Only 592 patients (346 females and 246 males) fulfilled the planned inclusion and exclusion criteria aged from (10-35) years old to avoid midline diastema due to ugly duckling stage in patients younger than 10 years old and due to and periodontal diseases and teeth migration in patients older than 35 years old.

The prevalence of midline diastema in our study was 15.2% which is close to other study by Adel et al. [17] (17.3%), and it is higher than a study by Elfadel II et al. [18] (7.3%) and Ozair et al. [19] (5.8%), and was lower than other studies by J Logeswari et al. [20], and Sahar et al. [21] were the prevalence was 21.8%, 22% respectively. This difference could be attributed to the difference in inclusion criteria, sampling technique or genetic predisposition [22].

Regarding the gender there is significant difference ($p=0.05$) hence prevalence of midline diastema in males was 18.3% which is higher than females 20% in this study, this agree with study by Luqman et al. [23] where males were 25% while females 15% and a study by Ghimire et al. [24] also reported a significant difference (16.6% males, 10% females).

Our results disagree with a study by Hasan et al. [25] (males 20.3%, females 26.4%) and other study by Drawn et al. [26] (males 31.5%, females 68.5%) where female have a higher prevalence. Regarding etiological factors responsible for midline diastema development, till now There is no agreement that single factors could be the precise etiological factor [27].

Regarding this study, statistical result show highly significant differences ($p=0.000$) the most common etiology affecting (24.4%) of subjects was generalized spacing, this finding came similar to that found by Luqman et al. [23] (39%) and Abdullah et al. [28] (42%) where spacing was the most common cause, while in other study by Israa I. Elfadel et al. [19] It was the second most common cause after high frenum attachment by percentage of 48.8%.

The second most common cause in our study was the genetic factor by percentage of 23.2% which agreed with studies by Luqman et al. [23] (9%) and Abdullah et al. [28] (39%) where it also was the second most common cause after generalized spacing. Meanwhile it was the first etiological factor contributing to Diastema in studies by Darwn et al. [26] (40%) and Biljana et al. [29] (49%).

In this study only 15.6% of patients with Diastema was due to highly frenum attachment although it was the first common cause contributing to diastema in study by Hasan et al. [25] (39.4%). A higher percentage than our study was also reported in studies by J Logeswari et al. [20] and luqman et al. [23] (18.3%, 30% respectively), while a lower percentage was reported by Biljana et al. [29] by only 3%.

Also in the present study lateral incisor which could be congenitally missing, peg shaped or unerupted was found in around 15.6% of patients with Diastema, which is equal to the prevalence of high frenum attachment in our study. The result is close to study by Hasan et al. [25] (16.4%) While a higher percentage was reported by Abdullah et al. [28] (24%) and Adel et al. [17] (43%).

Regarding the Central incisors as etiological factor which could be rotated, small or proclined, the percentage in our study was 6.7%, other studies by Israa I. Elfadel et al. [18] and Adel et al. [17] reported a higher result (17.5%, 43% respectively).

Regarded to abnormalities of canine which could be unerupted, impacted or malposed, the percentage of our study was only 11.1%, a study by Abdullah et al. [28] reported more than a double percentage (26%).

The other cause contributing to Diastema in our study was the unhealthy habits, only three patients had diastema due to habits (3.3%) which could be thumb sucking, tongue thurst or lip biting. This disagreed with a study by Darwn et al. [26] (40%) where it was the most frequent etiology in Diastema patients. A higher percentage were also reported by Luqman et al. [23] (9%).

The least percentage of the etiological variables for the diastema was the presence of mesiodens, only one case (1.1%) from the collected samples had diastema caused by it. This agree with study by Adel et al. [17] where it also was the least common cause in diastema patients by only four patients (6.2%). Other study by Biljana et al. [29] also reported only 3 patients (3%) had diastema due to meisodens.

In our study more than half of patients who showed Diastema 56.7% were consider it as an esthetic problem while (43.3%) had no problem with its presence so there's highly significant difference ($p=0.000$), this disagree with other study by Elfadel II et al. [18] she reported 43.8% of diastema patients consider it as an esthetic problem while 56.2% not.

In our study there is highly significant difference ($p=0.000$) between those who want to treat the diastema as an esthetic demand hence 54.4% want to treat it while 45.6% not, this could be due to age difference, gender, esthetic demand.

CONCLUSION

The prevalence of mid line diastema in our study was 15.2%. Regarding to gender, the prevalence of midline diastema was more in males than females. The most common etiological factor of maxillary midline diastema in this study was generalized spacing in both genders and The second most common cause in our study was the genetic factor. While the least common etiological variables for the diastema was the presence of mesiodens. More than half of patient who showed maxillary midline diastema consider it as an aesthetic problem While others were acceptant midline diastema.

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