

Prevalence of artificially created maxillary midline diastema and its complications in a selected Nigerian population

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Abstract

Background: Maxillary midline diastema (MMD) is generally regarded as a symbol of beauty in Nigeria. The desperation to look beautiful has caused many individuals to seek the creation of artificial midline diastema and that comes often with undesirable side effects.

Aim: To determine the prevalence of artificially created maxillary midline diastema (MMD) and its complications in a selected Nigerian population.

Method: A cross-sectional study using a semi-structured questionnaire as the instrument for data collection was done among patients attending a private clinic in Owerri the capital of Imo state in Nigeria over a period of 18 months. The data were retrieved from the questionnaires and analyzed using the SPSS version 20.

Results: There were 141 respondents comprising 58(41.1%) males and 83(58.9%) females, giving a male to female ratio of 1:1.4. The prevalence of artificially created MMD was 34.0% with increased frequency in: the 21-30 years age group; among the females and in respondents with tertiary level of education. Majority of the respondents (69.5%) desire MMD and 20.8% of those without it wanted it created through cosmetic dentistry. Twenty of the 48 respondents with artificial MMD had it done to enhance personal beauty and aesthetics. The commonest complication was tooth sensitivity (44.8%), followed by toothache (41.4%).

Conclusion: The prevalence of artificially created MMD was 34.0% in this study; and it is commoner in females and younger age group. The commonest complication was tooth sensitivity. Enhancement of personal beauty and aesthetic was the major reason for having it done.

Keywords: Artificially created, Maxillary Midline Diastema, Complications

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Introduction

Facial attractiveness is one of the components that determine overall attractiveness of an individual. Amongst the components of the face; the eyes and the mouth have been found to be the major determinates of its attractiveness^{1,2}. In the mouth, the teeth; their color, shape and size and arrangement, plays a major role in defining the attractiveness of a smile. A beautiful smile is said to be determined by the overall attractiveness of

an individual's teeth². In various cultures, certain aspects of the teeth such as color and arrangements especially in women are factors in determining the level of beauty. Various aspects of the teeth such as color, size, shape and arrangement influence the attractiveness of an individual. More females have had their beauty assessed by these parameters^{2,3}. In certain cultures, tooth color and shape determines the marriageability of the females. In Nigeria, the presence of maxillary midline diastema (MMD) is thought to enhance the attractiveness of an individual especially women³ unlike in the western societies where it is regarded as a malocclusion^{4,5,6}. Hence, many undergo mutilation of their anterior teeth in order to create one^{7,8}.

A diastema is a distinctive space between two teeth^{9,10}. It occurs more frequently in the midline of the maxillary teeth hence the common appellation, maxillary

midline diastema (MMD)¹¹. The midline diastema is a space (or gap) greater than 0.5mm between the mesial surfaces of maxillary central incisors¹². Naturally occurring midline diastema may result from a wide range of causes^{4,9,11}. Possible etiologies include genetic, dental-alar disproportion, a missing tooth, peg shaped lateral, unerupted midline supernumerary teeth, proclination of the upper labial segment, prominent frenum and due to a self-inflicted pathology by tongue piercing^{13,14,15}. True midline diastema is defined as the one without periodontal/periapical involvement and with the presence of all the anterior teeth in the arch¹¹. MMD has been found to be higher in blacks (5.5-26%) than in Caucasians (3.4-17%)^{16,17} and this high incidence has also been confirmed by Nigerian studies^{3,18,19}. Reports on sex predilection vary^{3,4,9}. A study conducted among the whites suggest that it is more common among the males⁴ while another study conducted among the blacks revealed that is more common among the females⁹.

Perception of midline diastema differs among individuals and cultures. Caucasians generally regard it as unaesthetic while Africans and Middle Easterners find it attractive. Hence amongst those who find it unaesthetic, they seek intervention to have it closed^{10,20}. In Nigeria, MMD is generally regarded as a symbol of beauty, especially in women hence individuals with midline diastema often enjoy a lot of compliments in the society^{3,9}. In a previous study⁹ conducted among Nigerians, about 30% of the participants would not mind having artificial diastema.

Certain authors^{7,21} had observed that it was not uncommon among some Africans to demand for artificially created midline diastema from dental practitioners. However, Oboro et al²¹ in 2008 reported that majority of dentists interviewed did not support the artificial creation of midline diastema. This situation has thus caused many individuals to seek the creation of artificial midline diastema from quacks and this comes often with undesirable side effects^{7,8}.

Few studies exist in Nigeria on the subject of MMD. These include those on the incidence and desirability of midline diastema,^{3,9,18,19,22} opinion of dentists on creation of midline diastema²¹ and a case report on the deleterious effect of creation of midline diastema⁷. None to our knowledge has examined incidence of ar-

tificially created diastema, reasons for its creation and incidence of complications following its creation. Hence this study was conducted to examine the above in a selected population of Nigerians. The outcome of this study will help to identify the factors that prevail on patients to earnestly desire midline diastema and engage in its artificial creation despite the possible complications that may follow the exercise.

Materials and method:

The study was cross-sectional in nature and it was carried out among patients attending a private clinic in Owerri the capital of Imo state in Nigeria over a period of 18 months using a semi-structured questionnaire as the instrument for data collection. The questionnaire was pretested for clarity on some patients whose questionnaires were not included in the final analysis. The patients were informed about the nature of the study and confidentiality was assured. Demographic data like age, gender, tribe and level of education were included in the questionnaire. The respondents were asked if they have natural or artificially created maxillary midline diastema, where the artificial diastema was done and if there were any complications arising from the procedure. They were also asked if they had any regrets creating the diastema. Data were analyzed with SPSS 20.0 statistical software. In addition to descriptive statistics, the chi-square test was used to determine the relationship between two parameters at 95% confidence level. Probability values (p-values) less than 0.05 were regarded as significant.

Results

There were 141 respondents comprising 58(41.1%) males and 83(58.9%) females, giving a male to female ratio of 1:1.4. Most of the respondents were Igbos 76.6% (108/141) while the other tribes made up minor percentages. Eighty-eight (62.4%) of the respondents had MMD; 40(28.4%) were natural while 48(34.0%) were artificially created. The highest prevalence of MMD in relation to socio-demographic variables was found in the 21-30 years age group comprising 30.5%(19 natural and 24 artificial diastemas); in females 42.6%(23 natural and 37 artificial diastemas); and in respondents with tertiary education 31.9%(20 natural and 25 artificial diastemas). There was a significant difference between male and females as regards prevalence of MMD (p<0.05) as shown in Table 1.

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Table 1: Socio-demographic characteristics of respondents with the incidence of MMD

Socio-Demographic Factors	Incidence of maxillary midline diastema				p-value	Age groups
	Natural	Artificial	None	Total		
<20	11	12	19	42(29.9)	0.714	
21-30	19	24	21	64(45.4)		
31-40	6	7	8	21(14.9)		
41-50	4	2	3	9(6.4)		
Gender	50	3	2	5(3.5)		
Male	17	11	30	58(41.1)	0.003	
Female	23	37	23	83(58.9)		
Level of Education					0.419	
Non formal	1	6	3	10(7.1)		
Primary	2	1	1	4(2.8)		
Secondary	17	16	16	49(34.8)		
Tertiary	20	25	33	78(55.3)		
Tribe					0.522	
Igbo	30	35	43	108(76.6)		
Yoruba	6	6	4	16(11.3)		
Hausa	1	5	5	11(7.8)		
Ijaw	3	2	1	6(4.3)		
Total	40(28.4%)	48(34.0%)	53(37.6%)	141(100.0%)		

Respondents desire for midline diastema

Ninety-eight (69.5%) of the respondents indicated their desire for MMD. Majority of those that wanted MMD were: in 21-30 years age group; females; those with

tertiary level of education; Igbos; and respondents with artificially created MMD. Among the 53 respondents without MMD, 11(20.8%) desired to have one as shown in Table 2.

Table 2: Respondents desire for midline diastema

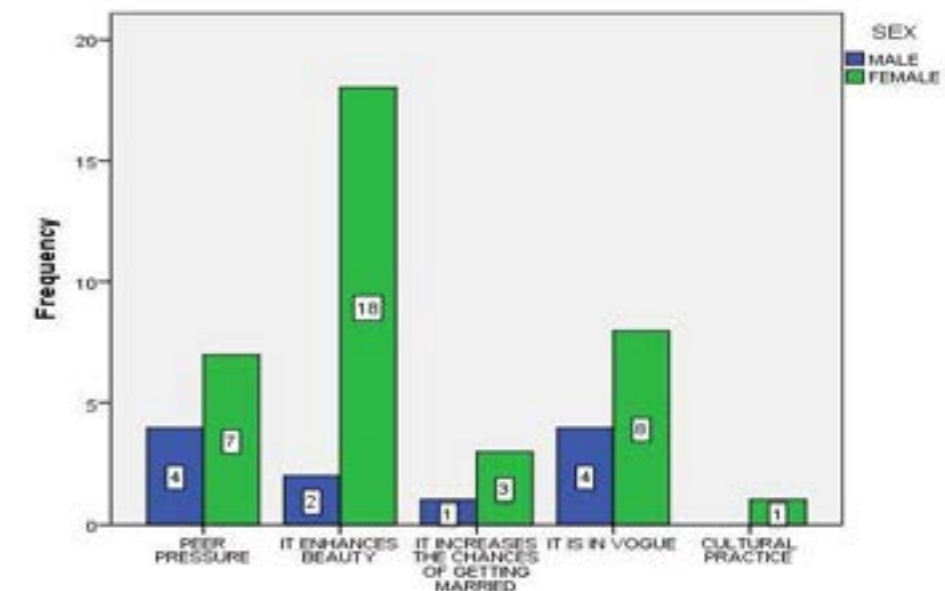
Socio-Demographic Factors	Desire for midline diastema			P-value
	Yes	No	Total(%)	
Age groups				0.9
<20	30	12	42(29.9)	
21-30	46	18	64(45.4)	
31-40	13	8	21(14.9)	
41-50	6	3	9(6.4)	
>50	3	2	5(3.5)	
Gender				0.001
Male	31	27	58(41.1)	
Female	67	16	83(58.9)	
Level of Education				0.017
Non formal	7	3	10(7.1)	
Primary	3	1	4(2.8)	
Secondary	42	7	49(34.8)	
Tertiary	46	32	78(55.3)	
Tribe				0.79
Igbo	73	35	108(76.6)	
Yoruba	12	4	16(11.3)	
Hausa	8	3	11(7.8)	
Ijaw	5	1	6(4.3)	
Presence of maxillary midline diastema				0.000
Natural	40(100.0%)	0(0.0%)	40(28.4)	
Artificial	47(97.9%)	1(2.1%)	48(34.0)	
None	11(20.8%)	42(79.2%)	53(37.6)	
Total	98(69.5%)	43(30.5%)	141(100.0%)	

Reasons for having artificial midline diastema created

Of the 48 respondents that had artificially created MMD, 20 of them did it to enhance their personal beauty and

aesthetics. While most of the females (48.7%; 18/37) created artificial MMD because it enhances personal beauty and aesthetics; the males did it due to peer pressure and because having MMD was in vogue as shown in Figure 1.

Figure 1: Reasons for having artificial midline diastema done



Where artificial diastema was created

Fifty-two point one percent (25/48) of the respondents with artificially created MMD indicated that their artificial diastema was created in a non-dental clinic (beauty salon, local dental quack etc). The association

of level of education, gender and respondents with complications with where artificial diastema was created shows no statistical significance. Despite the high frequency of complications, majority of the respondents (54.2%) had no regrets creating the diastema as shown in Table 3.

Table 3: Where artificial diastema was created

Level of Education	Dental clinic	*Non-dental clinic	Total (%)	p-value
Non formal	1	5	6(12.5)	0.201
Primary	0	1	1(2.1)	
Secondary	10	6	16(33.3)	
Tertiary	12	13	25(52.1)	
Gender				0.382
Male	4	7	11(23.0)	
Female	19	18	37(77.0)	
Where artificial midline diastema was done				
Patient with complications after artificial diastema				0.597
Yes	13	16	29(60.4)	
No	10	9	19(39.6)	
Patient with regrets after artificial diastema				0.753
Yes	10	12	22(45.8)	
No	13	13	26(54.2)	
Total	23(47.9)	25(52.1)	48(100.0)	

*beauty salon, local dental quack

Incidence of complications following creation of MMD

Twenty-nine(60.4%) of those with artificial MMD claimed to have complications following its creation.

The commonest complication was tooth sensitivity (44.8%) while bleeding (3.4%) was the least common complications. The time range for onset of these complications ranged from immediately after the procedure to years as shown in Table 4.

Table 4: Prevalence of complications following creation of MMD

Complications arising from artificial diastema	Where artificial midline diastema was done			p-value
	Dental clinic	*Non-dental clinic	Total (%)	
Tooth sensitivity	7	6	13(44.8)	0.483
Toothache	4	8	12(41.4)	
Tooth discoloration	2	1	3(10.3)	
Bleeding	0	1	1(3.4)	
Onset of complications				
Immediately	4	7	11(38.0)	0.514
Weeks after	5	6	11(38.0)	
Months after	4	2	6(20.6)	
Years after	0	1	1(3.4)	
Total	13(44.8%)	16(55.2%)	29(100.0%)	

*beauty salon, local dental quack

Discussion

In this current cross-sectional study of artificially created MMD among patients that attended a private clinic at Imo state, South Eastern Nigeria, a prevalence of 34.0% was found. The prevalence of 28.4% naturally occurring maxillary midline in this study is comparable to 21.0% and 26.0% reported at Ilorin, South-Western Nigeria and in a Tanzanian population respectively^{9,23}. The high prevalence of midline diastema in the Nigerian population, compared to the low prevalence seen in Caucasians, had been earlier reported^{3, 18,19,22,24}. The high frequency of artificial MMD in 21-30 years age group followed by those in less than 20 years age group is not surprising; since young individuals especially females tend to care more about aesthetics, facial appearance and self-esteem^{1,25}.

Occurrence of artificially created MMD was more in the females, as 37 (44.8%) of the female respondents

(83) had artificially created midline diastema, while only 11(19.0%) of the male respondents (58) had it. This was statistically significant with $p < 0.05$. It was of interest to note that there were more females than males attending the clinic, which is a common finding in our environment and underscores the importance attached to aesthetics and medical care by females²⁶. Previous studies^{3,9} have found MMD to be more prevalent in females.

About 70.0% of the respondents indicated their desire for maxillary midline diastema. This shows the value placed on it in our environment. Eleven (20.8%) of the 53 respondents not having midline diastema would love it created through cosmetic dentistry. This is comparable to 29.7% reported by Omotoso and Kadir⁹ in 2010. There was a statistical significant difference ($p < 0.05$) between gender, level of education and presence of midline diastema in our respondents with the desire for midline diastema.

Majority of the respondents with artificial MMD (41.7%) created it to enhance their personal beauty and aesthetics. While improvement of facial appearance is the major reason for the females, the males did it because it was the fashion trend and due to peer pressure (figure 1). Of the 48 respondents that had artificial MMD, 23 (47.9%) claimed it was done in a dental clinic while the remaining 25(52.1%) mentioned other locations like beauty salon and local dental quack. The creation of artificial MMD in a dental clinic by the 23 respondents is questionable, since a report by Oboro et al²¹ in 2008 said most Nigerian dentist did not support the creation of artificial midline diastema. A possible explanation is that the respondents were friends or relatives of such dentists; and after much persuasion, the dentists were forced to create it against their ethical beliefs. Also, it is not uncommon in our environment for allied dental professionals such as dental technologists to set up dental clinics due to low ratio of dentists to the populace in Nigeria, especially in the south eastern region, the location of this study. They are subsequently patronized by the unsuspecting public often with undesirable consequences. There is therefore need for the relevant regulatory and monitoring agencies to checkmate this unprofessional misconduct.

The relatively high consultation of non-dental professionals (52.1%) for artificial creation of MMD irrespective of educational level and gender underscores the respondents' desperation and obsession. The obsession for artificial midline diastema in our environment was illustrated by Arigbede and Abe⁷ in a case report of a young literate woman who subjected herself to a dental quack. The deleterious effect of the procedure resulted in pain and decreased aesthetics due to tooth color change and also avoidable expenditure of time and finances.

Twenty-nine (60.4%) of the respondents that did artificial MMD had complications and this incidence was more among those that consulted non-dental professionals. The commonest complication was tooth sensitivity (44.8%), followed by toothache (41.4%). These could have resulted from excessive removal of enamel, dentinal exposure and thermal injury to the pulp. A previous study⁸ conducted among rural dwellers in the Niger-Delta region of Nigeria also reported increased frequency of tooth pain and sensitivity. However, despite the increased frequency of complications re-

sulting from artificial creation of MMD, most of the respondents (54.2%) claimed they had no regrets creating it. This non regret could be alluded to the fact that their primary objective of having a MMD had been met, so the complications was a small price for beauty. Also, it could be said that since the respondents were likely unaware of the morbidity and mortality of teeth involved in artificial MMD, they cared less about the complications.

Consequent to the results of this study, public enlightenment programmes should be conducted by dentists to educate people of the deleterious consequence of having MMD artificially created as well as the attendant health hazards of having such in places where infection control measures cannot be confirmed.

Conclusion

The prevalence of artificially created MMD was 34.0% in this study; and it is commoner in females and younger age group. The commonest complication was tooth sensitivity Enhancement of personal beauty and aesthetic was the major reason for having it done. This study validates the myth that having space in between the upper anterior teeth symbolizes beauty.

References

- Baldwin DC. Appearance and aesthetics in oral health. *Community Dent. Oral Epidemiol.* 1980; 8: 244-256.
- Qualtrough AJE, Burke FJT. A look at dental aesthetics. *Quintessence international* 1994;25(1):7-14
- Oji C and Obiechina AE. Diastema in Nigerian society. *Odonto-Stomatologie Tropicale* 1994;17(68):4-64
- Oesterle LJ, Shellhart WC. Maxillary midline diastema: a look at the causes. *J Am Dent Assoc.* 2004;135(7):875-8815
- Kerosuo H, Hausen H, Laine T, Shaw WC. The influence of incisal malocclusion on the social, attractiveness of young adults in Finland. *Eur J Orthod* 1995; 17:505-512.
- Rosenstiel SF, Rashid RG. Public preferences for anterior tooth variations: a web-based study. *J Esthet Restor Dent* 2002;14:97-106
- Arigbede AO and Adesuwa AA. A case of quackery and obsession for diastema resulting in avoidable endodontic therapy. *Afr Health Sci.* 2012; 12(1): 77-80.

8. Ukegheson GE, Akadiri OA. The practices and effects of tooth mutilation in a Nigerian rural population. *Nig Dent J* 2011;2:62-65
9. Omotosho GO, Kadir E. Midline diastema amongst South-Western Nigeria. *The Internet Journal of Dental Science*. 2010;8(2)
10. Luqman M, Sadatullah S, Saleem MY, Ajmal M, Kariri Y, Jhair M. The prevalence and etiology of maxillary midline diastema in a Saudi population in Aseer region of Saudi Arabia. *Int Journal of Clinical Dental Science* 2011; 2(3):81-85.
11. Nainar SM, Guanasantaram N. Incidence and etiology of midline diastema in a population in South India (Madras). *Angle Orthod* 1989; 59 (4): 277-282
12. Keene HJ. Distribution of diastemas in the dentition of man. *Am J Phys Anthropol*. 1963;21:437-441
13. Umar Hussaina, Ali Ayubb, Muhammad Farhan. Etiology and treatment of midline diastema: A review of literature. *POJ* 2013;5(1) 27-33
14. Edwards JG. The diastema, the frenum, the frenectomy: a clinical study. *Am J Orthod* 1977; 71: 489-508.
15. M. J. Fehrenbach, "Tongue piercing and potential oral complications," *Journal of Dental Hygiene* 1998; 72(1): 23-25.
16. Richardson ER, Malhotra SK, Henry M, Little RG, Coleman HT. Bi-racial study of the maxillary midline diastema. *Angle Orthod*1973; 43:438-443.
17. Lavelle CL. The distribution of diastemas in different human population samples. *Scand J Dent Res* 1970;78:530-534
18. Isiekwe MC. Maxillary midline diastema in Nigeria. *Nig Dent J*. 1983; 4: 60-66.
19. da Costa OO. Midline diastema in a Northern Nigeria population. *Nig Qt J Hosp Med* 1996; 6: 289-289.
20. Kindernecht KE, Kupp LI. Aesthetic solution for large maxillary anterior diastema and frenum attachment. *The Aesthetic Chronicle*. 1996;8(1):95-110.
21. Oboro HO, Umanah AU, Chukwumah NM, Sede M. Creation of artificial midline maxillary diastema: opinion of Nigerian dentists. (online) 2008 (cited 2009 Nov16). Available from:http://iadr.confex.com/iadr/pef08/techprogram/abstract_109649.htm
22. Sanu OO. The Prevalence and Predisposing Factors of Midline Diastema in Schoolchildren in South-west Nigeria. *Nig J Health* 2002; 2: 11-14.
23. Athumani AP and Mugonzibwa EA. Perception on diastema medialis (mwanya) among dental patients attending Muhimbili National Hospital. *Tanzania Dental Journal* 2006;12 (2)50-57.
24. Otuyemi OD, Abidoye RO. Malocclusion in 12 years old suburban and rural Nigerian children. *West Afr J Med* 1999; 18: 91-96.
25. Akarslan ZZ, Sadik B, Erten H, Karabulut E. Dental esthetic satisfaction, received and desired dental treatments for improvement of esthetics. *Indian J Dent Res* [serial online] 2009[cited 2012 Apr 15]; 20:195-200. Available from: <http://www.ijdr.in/text.asp?2009/20/2/195/52902>
26. Scavo R, Martinez Lalis R, Zmener O, Dipietro S, Grana D, Pameijer CH. Frequency and distribution of teeth requiring endodontic therapy in an Argentine population attending a specialty clinic in endodontics. *Int Dent J*. 2011 Oct; 61(5):257-260.