

INCIDENCE OF ASYMMETRIC MOLAR AND CANINE RELATIONSHIP

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ABSTRACT:

Objective: To determine the incidence of asymmetric molar and canine relationships.

Study design: Cross sectional study

Place and duration of the study: Dr. Ishrat Ul Ebad Khan Institute of Oral Health Sciences, Dow University, Karachi, from April 2013 to June 2013.

Material and methods: 500 subjects their age ranging from 13 to 25 year were selected. They were examined clinically and through their pre-ortho treatment records which included study models and intraoral photographs. Descriptive statistical analyses were used to determine the incidence of different molar and canine asymmetries.

Results: The total incidence of asymmetric molar and canine relationship is 33.2% and 16.6% respectively.

Conclusion: Mild asymmetric molar relationships are significantly more common than their moderate and severe counterparts. Half-step class II asymmetries being more frequent than molar full-step asymmetries. In the canine region full step asymmetry was seen in moderate range. Class II half and full-step asymmetries are more prevalent than Class III asymmetries in the molar and canine regions. Few cases were found to have two full-step asymmetry in the molar or canine areas. Gender did not influence the prevalence or magnitude of asymmetry.

Key words: asymmetry; molar and canine relationship

INTRODUCTION:

It is a well-known fact that faces are not perfectly symmetric, with facial expressions being more prominent on the left side of the face due to the hemispheric dominance.^[1] Studies have proven that symmetric faces are more attractive and acceptable in the society, and clinically right left symmetry of the dentofacial structures is one of the prime treatment goals for a harmonious relationship.^[1-5]

Van Valen^[6], has described three basic types of asymmetries; directional, antisymmetry and fluctuating asymmetry. Most of the times there is no identifiable cause for asymmetry, majority being as a result of trauma and other being developed as a result of chewing side preference more on one side. Directional asymmetry occurs when development of one side is different from other during normal development. Antisymmetry, much less common and occurs when one side is larger than the

other but which side is larger cannot be predicted. Fluctuating asymmetry is the magnitude of difference between the sides, observed in primary, permanent dentition as well as craniofacial structures.^[6]

Asymmetric malocclusion may occur due to multiple factors ; premature loss of tooth or tooth displacement leading to dental arch asymmetry , skeletal asymmetry , mandibular lateral shift associated with posterior crossbite, genetic influence, perioral habits or amalgamation of these factors. An asymmetric malocclusion gives a massive challenge to the orthodontist in terms of diagnosis and treatment planning. Investigating the aetiology is very important in asymmetric cases. Diagnosis in asymmetric cases can be done with specific tools such as symmetropost, occlusogram , wax set up and radiographs such as posteroanterior cephalogram and submentovertex.^[3]

Still due to the shortcomings of Angle classification system, it is one of the accepted method for classification and many studies have used this method to assess the prevalence in their studies.^[1-22] Therefore our study covers a wide range of sample in Pakistani subjects in permanent dentition and provides appropriate information regarding the severity and trait of occlusal asymmetries in the molar and canine regions.

MATERIAL & METHODS:

This study was conducted at the orthodontic department of Dr. Ishrat-ul- Ibad Khan Institute of oral health sciences (DIKIOHS), Dow University, Karachi, Pakistan from April 2013 to June 2013. Non probability purposive sampling was done to select 500 patients of either sex who came for orthodontic treatment in outpatient orthodontic department. Their ages ranged from 13 – 25 years and all the subjects were in their permanent dentition stage. Molar and canine relationships were entered as missing data when these could not be scored due to missing, extracted, or impacted tooth. Patients with any syndrome or anomaly were excluded from this research.

The data was recorded by assessing patients molar and canine relationships through their orthodontic records which included their intraoral pictures and cast analysis. All occlusal parameters were assessed when the teeth were in maximum intercuspation. Molar relationship was scored by definitions as described by Angle as full-step Class III, Class I, and Class II .^[5] Half-step Class II was scored if the mesial aspect of the maxillary first molar was flush with the mesial aspect of mandibular first molar. Similar criteria were used for scoring the canine relationships, with full step Class II and Class III denoting occlusion of the maxillary canine cusp at the mesial aspect of the mandibular canine and distal aspect of the mandibular first premolar respectively. Incidence of occlusal asymmetries was determined in molar and canine areas by

calculating the number and in the percentage of males and females with asymmetric molar and canine relationships according to the following morphological criteria:

Half- step asymmetries (Half step class II on one side)

- Full step class I on the other
- Full step class II on the other

- Full step class III on the other

Full step asymmetries (class I on one side)

- Full step class II on other (class II subdivision)
- Full step class III on other

Two full step asymmetries (class II on one side class III on the other)

Table 1 Incidence of all possible molar relationships (N =455)

		Left molar						
Right molar		Missing n(%)	Class I n(%)	Class II n(%)	Half cusp Class II n(%)	Class III n(%)	Classification of asymmetry	Incidence %
	Class I	6	167 (33.4)	17 (3.4)**	19 (3.8)*	6 (1.2)**	Half step asymmetry*	22.4%
	Class II	7	27 (5.4)**	108 (21.6)	21 (4.2)*	1 (0.2)***	Full step asymmetry**	10.6%
	Half cusp class II	1	29 (5.8)*	36 (7.2)*	16	3 (0.6)*	Two full step asymmetry***	0.2 %
	Class III	2	3 (0.6)**	0***	1 (0.2)*	5 (1)	Total asymmetries	33.2 %
	missing	8	10	3	2	0	Total symmetric relationship	56 %
							Total	100

*half step asymmetries**full step asymmetries***two full step asymmetry

Table 2 Incidence of all possible canine relationships (N =452)

		Left canine					
Right canine		Missing n(%)	Class I n(%)	Class II n(%)	Class III n(%)	Classification of asymmetry	Incidence %
	missing	24	5(1)	9(1.8)	0	Full step asymmetry*	16.6%
	Class I	6	84(16.8)	35(7)*	2(0.4)*	Total symmetric relationship	71%
	Class II	15	38*	261(52.2)	5(1)*		
	Class III	1	1(0.2)*	2(0.4)*	10(2)		
						Total	100

*Full step asymmetry

RESULTS :

Amongst 500 patients examined for this study 167 (33.4%) had an almost ideal occlusion and for the remaining 333 (66.6%) patients with a malocclusion the total incidence of asymmetric molar relationship is 33.2% with 10.8 % of cases falling under moderate to severe occlusal asymmetry (table 1). The total incidence of asymmetric canine relationship is 16.6%. Two full step asymmetries were seen among 0.2% of the patients.

In molar region, half step asymmetries were found to be 22.4%, full step asymmetry as 10.6% and two full step asymmetry was found to be 0.2%. When comparing the asymmetry of the molars it is prevalent from these results that half-step asymmetries are more common in our Pakistani subjects than the full step.

In the canine region full step asymmetries upto 16.6% was prevalent, with class II subdivision ranging upto 14.6 %. Total symmetric relation was seen upto 71%.

DISCUSSION:

As in every orthodontic practice the ideal goal is to achieve the most stable position which is ideal and mutually protected, therefore achieving ideal molar and canine relationship is considered important and establishing ideal canine relationship is more relevant for functional and stable position. Therefore incidence of different types of canine relationships is

considered of greater clinical significance than molar relationships.^[1-4] As it is acceptable to finish in Class III or Class II molars when camouflaging but it is always important to finish canines with a Class I canine relationship, thus the significance of achieving class I canine relationship is further highlighted.^[5]

This study has provided distinction between mild, moderate and severe occlusal asymmetries. Following the method of categorization of asymmetries it can be concluded from this study that most of the molar asymmetries are within the mild to moderate range (table 1), with half step being more prevalent 22.4% in the molar region. Further in this context the incidence of full step molar asymmetry was 10.6% and two full step asymmetry was 0.2%.

In canine region full step asymmetry was prevalent with ranging within mild range 16.6%. Some international studies have also reported a similar trend.^[4] Those authors found half-cusp asymmetries to be more common than full-step asymmetries (26.9 and 20.3 per cent, respectively) in an Hungarian population.^[4] Similarly, Lux et al^[22] also found half-step malocclusion to be more prevalent than a full-step malocclusion in 494 German school children. Harris and Bodford^[1] concluded from their study that asymmetries are found in all three categories of Angle's classification and were greatest in subjects with severe Class II malocclusions.

It was further observe that twofull step asymmetry including one class II on one side and class III on the other (class IV) [6] was prevalent in molar and canine region in our population. In molar region it is prevalent 0.2 % and in canine region 1%, in comparative to study by Behbehni et al [2] in which two full step asymmetry was not prevalent in canine and molar region.

This study is first to address the incidence of asymmetric molar and canine relationship in Pakistani subjects. Though it has not highlighted the complex relationship of treatment need and other aspects of malocclusion ,but it has successfully provided the severity of asymmetric trait in saggital relationship of Pakistani subjects .

REFERENCES:

1. Harris E F, Bodford K 2007 Bilateral asymmetry in the tooth relationships of orthodontic patients. Angle Orthodontist 77: 779–786
2. Prevalence of asymmetric molar and canine relationship Faraj Behbehani, Rino Roy and Badreia Al-Jame
3. Benson P 2003 Angle's classification—time to move on? Journal of Orthodontics 30: 279 (Editorial)
4. Gábris K, Márton S, Madléna M 2006 Prevalence of malocclusions in Hungarian adolescents. European Journal of Orthodontics 28: 467–470
5. Vig P S, Hewitt A B 1975 Asymmetry of the human facial skeleton. Angle Orthodontist 45: 125–129
6. Graber 5thed
7. Alavi D G, BeGole E A, Scheider B J 1988 Facial and dental arch symmetries in Class II subdivision malocclusion. American Journal of Orthodontics and Dentofacial Orthopedics 93: 38–46
8. Al-Emran S, Wisth P J, Böe O E 1990 Prevalence of malocclusion and need for orthodontic treatment in Saudi Arabia. Community Dentistry and Oral Epidemiology 18: 253–255
9. Altemus L A 1959 Frequency of the incidence of malocclusion in American Negro children aged twelve to sixteen. Angle Orthodontist 29: 189–200

CONCLUSION:

The results of this research conclude that the total asymmetric relationships in molar region were 33.2% and 16.6% in the canine region respectively. Mild asymmetric molar relationships are significantly more common than the moderate and severe counterparts. Half-step asymmetries being more frequent than molar full-step asymmetries. In the canine region full step asymmetry was seen in moderate range. Class II half and full-step asymmetries are more prevalent than Class III asymmetries in the molar and canine regions. Few cases were found to have two full-step asymmetry in the molar or canine areas.

10. Angle E H 1907 Treatment of malocclusion of the teeth. Angle's system. S S White Dental Manufacturing Company, Philadelphia
11. Behbehani F, Artun J, Al-Jame B, Kerosuo H 2005 Prevalence and severity of malocclusion in adolescent Kuwaitis. Medical Principles and Practice 14: 390–395
12. Cheney E A 1952 The influence of dentofacial asymmetries upon treatment procedures. American Journal of Orthodontics 38: 934–945
13. Cochran W G 1977 Sampling techniques. John Wiley, New York
14. El-Mangoury N H, Mostafa Y A 1990 Epidemiologic panorama of dental occlusion. Angle Orthodontist 60: 207–214
15. Garner L D, Butt M H 1985 Malocclusion in Black Americans and Nyeri Kenyans. An epidemiologic study. Angle Orthodontist 55: 139–146
16. Helm S 1968 Malocclusion in Danish children with adolescent dentition: an epidemiologic study. American Journal of Orthodontics 54: 352–366
17. Janson G R, Metaxas A, Woodside D G, Freitas M R, Pinzan A 2001 Three dimensional evaluation of skeletal and dental asymmetries in Class II subdivision malocclusions. American Journal of Orthodontics and Dentofacial Orthopaedics 119: 406–418
18. Katz M I 1992 Angle classification revisited 1: is current use reliable. American Journal of Orthodontics and Dentofacial Orthopedics 102: 173–179
19. Keski-Nisula K, Lehto R, Lusa V, Keski-Nisula L, Varrelä J 2003 Occurrence of malocclusion and need of orthodontic treatment in early mixed dentition. American Journal of Orthodontics and Dentofacial Orthopedics 124: 631–638
20. Lew K K, Foong W C, Loh E 1993 Malocclusion prevalence in an ethnic Chinese population. Australian Dental Journal 38: 442–449.
21. Proffit W R, Fields H W, Sarver D M 2007 Contemporary orthodontics, 4th edn. Mosby, St Louis, p. 242
22. Lux C J, Ducker B, Pritsch M, Kompisch G, Niekusch U 2009 Occlusal status and prevalence of occlusal malocclusion traits among 9 year old schoolchildren. European Journal of Orthodontics 31: 294–299