LONGITUDINAL CHANGES IN DENTAL ARCH CIRCUMFERENCE IN SULAIMANI CITY

Fadil A. Kareem, PhD
Tara A. Rasheed, MSc
Aras M. Rauf, PhD
Department of Preventive dentistry, Orthodontics and Pedodontics,
College of Dentistry, University of Sulaimani

Abstract

Background: Evaluation of dental arches is of great importance for definitive diagnosis and optimal craniofacial treatment. The circumference or perimeter is the most important dimension of the dental arch and it changes according to age and gender. This issue hasn't been conducted yet in sulaimani city;

Aims: aim of the present study was to assess the dimensional changes in the dental arches occurring during the transitional period from mixed to permanent dentition in individuals with normal dentition.

Methods: A group of fifty children with normal dentition aged 8-9 years were selected according to specific criteria in sulaimani city in kurdistan of iraq, dental arch dimensions were measured. Five years later, a second examination and measurement was performed to record the changes in dental arches. The data was analyzed by using statistical package for social sciences (SPSS, version 15) program for obtaining the descriptive statistics including the mean, and standard deviation, also the inferential statistics (t-test) was applied to test the significance difference between the dimensions.

Results: The study showed an increase in the arch perimeter of the maxilla in the transition from mixed to permanent dentition for both males and females whereas in the lower arch it was the reverse. The arch perimeter differences between maxillary and mandibular arches show high significancy in both mixed and permanent dentitions P(0.00), P(0.00). There was asymmetry in the ach length between right and left side for both mixed and permanent dentition and most of the measurements of the permanent dentition showed high significant differences between right and left sides. There was a significant difference P(0.00) in maxillary and mandibular left and right incisor- canine distance (I-C) between males and females.

Conclusion: Controlling the reduction of total arch length in the transition period from mixed dentition to permanent dentition may help in the early treatment of crowding of the teeth.

Keywords: Dental arch circumference, mixed dentition, permanent dentition, sulaimani

Introduction

Dental arch dimensions change systematically during the period of intensive growth and development and less so in adulthood (Carter GA, McNamara JA-1998). Dental arch dimensions are not static; they change systematically during the period of intensive growth and development (Moorrees CFA-1959, Sillman JH- 1964, Knott VB -1972, Cohen JT-1940). Causes of changes in size and form of the dental arch are multifactorial, such as sutural expansion in the maxilla, remodeling of alveolar bone (Ross-Powel RE, Harris EF-2000, Dempster WT, Adams WJ, Duddies RA-1963, Harris EF -1997) interarch relationships of the teeth, and contractile properties of supracrestal fibers (Goose DH, Appleton J-1982). In the dental arch, relatively rapid changes occur during transitional dentition, and once a functional permanent dentition is established, smaller changes are observed to continue (Carter GA, McNamara JA-1982). The understanding of the sagittal and transversal changes that occur between mixed and permanent dentitions in the maxillary and mandibular arches is crucial for the clinician interested in early orthodontic treatment. It has been reported that growth and development period have been influenced by environmental factors, nutrition, and ethnic variations; systemic, health, and individual variations could also occur (Bishara SE, Jakobsen JR, Treder J-1997).

Evaluation of dental arches is of great importance for definitive diagnosis and optimal craniofacial treatment. The values of the dimensions of the arch include: width, depth and circumference, intercanine and intermolar distances, overjet and overbite, which change during growth in different ways (the width of the teeth remains the same, whereas the lengths of the mandibular and maxillary bones increase) (Prabhakaran S, Sriram CH, Muthu MS, Rao CR, Sivakumar N-2006).

The circumference or perimeter is the most important dimension of the dental arch and changes according to age and gender. The increases in the arch are more related to the events underlying tooth development and somewhat less to skeletal growth (Alhaija ESJ, Qudeimat MA-2003).

Many authors (Bishara SE, Treder JE, Damon P, Olsen M -1996, Bishara SE, Jakobsen JR, Treder J-1998, Eslambolchi S, Woodside DG, Rossouw PE-2008, Slaj M, Jezina MA, Lauc T, Rajić-Mestrović S, Miksić M- 2003, Moorrees CF, Chadha JM.- 1965, Sinclair PM, Little RM.- 1983,

Harris EF-1997) have also reported an increase in arch perimeter until permanent dentition is completed and a diminution of this dimension with age, mainly in the lower arch (Dager MM-2008, Tibana RH, Palagi LM, Miguel JA-2004). Some studies suggest that arch size has a modest genetic component and that arch length and width growth factors are largely independent (Cassidy KM, Harris EF, Tolley EA, Keim RG-1998). As regards the different dimensions of dental arches between sexes, it can be observed that, generally speaking, males present greater arch dimensions than females (Cassidy KM, Harris EF, Tolley EA, Keim RG-1998, Knott VB-1972, Bishara SE, Jakobsen JR, Treder J-1997, Knott VB-1961, Bishara SE, Treder JE, Damon P, Olsen M-1996, Haralabakis NB, Sifakakis I, Papagrigorakis M, Papadakis G-2006, Mutinelli S, Manfredi M, Cozzani M - 2000). The clinical importance of predicting changes in dental arch form is obvious. By changing dental arch form without modifying its dimension, different arch lengths may be achieved for each millimeter of incisor proclination (DeKock WH-1972).

Materials and methods

This issue hasn't been conducted yet in sulaimani city; therefore the current study aims to assess the dimensional changes in the dental arches occurring during the transitional period from mixed to permanent dentition in individuals with normal dentition. The study involved 50 children aged 8-9 years from the city of Sulaimani in Iraqi Kurdistan. The children were examined twice: the first examination was done at recruitment at the mixed dentition stage (8-9) years and the second examination was done after 5 years at permanent dentition stage (13-14) years. A consent form was filled by the participant's parents. During both examinations, alginate impressions of both upper and lower dental arches were taken for all the 50 children and dental stone was poured into the impressions immediately. The dental casts obtained were used for measuring various dental arch dimensions using digital sliding calipers. Approval of ethical committee of Faculty of Medical Sciences/ University of Sulaimani was obtained before conducting the present study.

The dental arch perimeter is the distance from the mesio-buccal cusp of the first permanent molar around the dental arch to the same point in the opposite side. It was measured from adding four segmental measurements with each other's, which included two incisal segments and two buccal segments, while the dental arch segmental measurements are

1. Incisal – canine distance (right and left): The linear distance from the incisal point to the canine cusp tip.

2. Canine – molar distance (right and left): The linear distance from the canine cusp tip to the mesiobuccal cusp tip of the first permanent molar.

3. Incisal – molar distance (right and left): The linear distance from the incisal point to the mesiobuccal cusp tip of the first permanent molar.

The data was analyzed by using statistical package for social sciences (SPSS, version 15) program for obtaining the descriptive statistics including the mean, and standard deviation, also the inferential statistics (t-test) was applied to test the significance difference between the dimensions. Paired t-test was used to determine the changes that occur during growth. Student t-test was used to know if there were any differences between measurements in regard to gender. The critical level of statistical significance was determined at a probability level of less than 0.05 ($P \leq 0.05$).

Inclusion criteria:

1. The eruption of the first molar or permanent incisors (or both) was the criteria of sample selection at the beginning of study.
2. All subjects were healthy free from any chronic condition affecting growth.
3. Absence of crowding.
4. No history of orthodontic treatment.

Results:

The total sample in this longitudinal study was 50 children with normal dentition. the equal number of males and females were taken to be included in the present study. In this study there was a significant difference P(0.00) in maxillary and mandibular left and right incisor- canine distance (I-C) between males and females (Table I,II).

Asymmetry was also revealed in the arch length between right and left side for both mixed and permanent dentition. Most of the measurements of the permanent dentition show high significant differences between right and lefts (Table III).

The arch perimeter differences between maxillary and mandibular arches show high significancy in both mixed and permanent dentitions P(0.00), P(0.00). All the measurements of the maxillary arch greater than the mandibular arch except for (C-M) of the left side for mixed dentition and right side for permanent (Table IV).

There was an increase in the arch perimeter of the maxilla in the transition from mixed to permanent dentition for both males and females whereas in the lower arch it was the reverse. Also the results showed a decrease in canine – molar distance (C-M) of the four segments of the arches between mixed to the permanent dentition (Table V). The (I-C) measurements of all segments of the sample's dental arches greater in permanent than mixed dentition whereas the (I-M, C-M) was in reverse to that. All the measurements of the sample showed high significant difference between mixed to permanent dentition except mandibular (I-M) and maxillary (I-C, C-M) (Table V).

Discussion

In this study the asymmetry was observed in the arch length between right and left side for both mixed and permanent dentition, and most of the measurements of the permanent dentition show high significant differences between right and lefts. The arch perimeter differences between maxillary and mandibular arches show high significancy in both mixed and permanent dentitions.

There were a number of studies investigating changes in dental arches during the period of growth. Some of these studies showed that dental arch form and size were affected variability in eruptive paths of the teeth, growth of the supporting bones (Dager MM, McNamara JA, Baccetti T, Franchi L-2008, Harris EF-1997, Knott VB-1961), and movement of the teeth after emergence due to habits and unbalanced muscular pressure (Bishara SE, Treder JE, Damon P, Olsen M-1996, Haralabakis NB, Sifakakis I, Papagrigorakis M, Papadakis G-2006)**.** Subjects evaluated in this study had no parafunction, but had normal occlusion and acceptable aesthetic; Therefore, the changes observed in the study were physiological.

In this study, incisor-canine length increased in both jaws in the transition from mixed to permanent dentition with greater increase in the maxilla than the mandible because of greater mesio-distal dimension of maxillary incisors and canines. On the other hand canine-molar, incisor-molar, total dental arch lengths decreased both in maxilla and mandible and there was a greater decrease in the mandible than the maxilla due to the greatness of leeway space in the mandible. These results are in agreement with the results of DeKock WH -1972,Moores CFA -1959, Sinclair PM, Little RM-1983, Bishara SE, Jakobsen JR, Treder JE, Stasi MJ-1989, and Harris EF -1997, who reported a decrease in the dimension of arch length with the attainment of adulthood, afterwards the dental arch attains the stable dimension.

The present study agreed with the Shrestha RM, Bhattarai P- 2008, 2009 which reported that arch dimensions of the males were significantly greater compared to females, also in agreement with the findings of Barrett MJ, Brown T, Macdonald MR -1965, Bishara SE, Treder JE, Damon P, Olsen M- 1996and Huang ST, Miura F, Soma K-1991 confirming that arch lengths of the males were greater than those of the females. The present study is also consistent with the contemporary studies on arch circumference (Huang ST, Miura F, Soma K -1991) of the Nepalese adults; which reported that arch dimensions of the Nepalese males were significantly greater as compared to females. Most theories consider dental arch forms to be symmetrical. However, White LW-1977 observed a great deal of asymmetry in the dental arches. Lavelle CLB, Plant CG-1969 observed the dimensions of the teeth and arch lengths on the right side were greater than those on the

left, but the differences were insignificant agree with the present study, but Bishara SE, Jakobsen JR, Treder JE, Stasi MJ-1989 found no significant differences between right and left sides in arch length measurement in a disagreement with our results.

The apparent bilateral differences on arch dimensions in this study showed that dental arch with normal occlusion is dimensionally asymmetrical which are in agreement with Shrestha RM,BhattaraiP-2009.

Conclusion

The results of this study indicate that controlling the reduction of total arch length in the transition period from mixed dentition to permanent dentition may be helpful for the early treatment of crowding.

References:

Carter GA, McNamara JA: Longitudinal dental arch changes inadults. Am J Orthod Dentofacial Orthop, 1998, 114:88–99.

Moorrees CFA. The Dentition of the Growing Child: A Longitudinal Study of Dental Development Ages 3–18. Cambridge, Mass: Harvard University Press, 1959:87–110.

Sillman JH. Dimensional changes of the dental arches: longitudinal study from birth to 25 years. Am J Orthod, 1964, 50:600–616.

Knott VB. Longitudinal study of dental arch width at four stages of dentition. Angle Orthod, 1972, 42:387–395.

Cohen JT. Growth and development changes of the dental arches in children. J Am Dent Assoc, 1940, 27: 1250-1260.

Ross-Powel RE, Harris EF. Growth of the anterior dental arch in black American children: A longitudinal study from 3 to 18 years of age. Am J Orthod Dentofacial Orthop,2000, 118:649–657.

Dempster WT, Adams WJ, Duddies RA. Arrangement in the jaws of the roots of the teeth. J Am Dent Assoc, 1963,67:779-797.

Harris EF. A longitudinal study of arch size and form in untreated adults. Am J Orthod Dentofac Orthop, 1997,111:419-427.

Goose DH, Appleton J. Human dentofacial growth. New York: Pergamon Press 1982.

Carter GA, McNamara JA. Longitudinal dental arch changes in adults. Am J Orthod Dentofacial Orthop, 1998, 114:88–99.

Bishara SE, Jakobsen JR, Treder J, Nowak A. Arch width changes from 6 weeks to 45 years of age. Am J Orthod Dentofacial Orthop, 1997,111:401-9

Prabhakaran S, Sriram CH, Muthu MS, Rao CR, Sivakumar N. Dental arch dimensions in primary dentition of children aged three to five years in Chennai and Hyderabad. Indian J Dent Res, 2006,17(4):185-9.

Alhaija ESJ, Qudeimat MA. Occlusion and tooth/arch dimension in the primary dentition of preschool Jordanian children. Int J Paediatr Dent, 2003,13:230-9.
Bishara SE, Treder JE, Damon P, Olsen M. Changes in the dental arches and dentition between 25 and 45 years of age. Angle Orthod, 1996,66:417-22.
Bishara SE, Jakobsen JR, Treder J, Nowak A. Arch length changes from 6 weeks to 45 years. Angle Orthod, 1998,68:69-74.
Eslambolchi S, Woodside DG, Rossouw PE. A descriptive study of mandibular incisor alignment in untreated subjects. Am J Orthod Dentofacial Orthop, 2008,133:343-53.
Slaj M, Jezina MA, Lauc T, Rajić-Mestrović S, Miksić M. Longitudinal dental arch changes in the mixed dentition. Angle Orthod, 2003,73:509-14.
Moorrees CF, Chadha JM. Available space for the incisors during dental Development-a growth study based on physiologic age. Angle Orthod, 1965,35:12-22.
Sinclair PM, Little RM. Maturation of untreated normal occlusions. Am J Orthod, 1983,83:114-23.
Harris EF. A longitudinal study of arch size and form in untreated adults. Am J Orthod Dentofacial Orthop, 1997,111:419-27.
Dager MM, McNamara JA, Baccetti T, Franchi L. Aging in the craniofacial complex. Angle Orthod, 2008,78:440-4.
Tibana RH, Palagi LM, Miguel JA. Changes in dental arch measurements of young adults with normal occlusion--a longitudinal study. Angle Orthod, 2004,74:618-23.
Cassidy KM, Harris EF, Tolley EA, Keim RG. Genetic influenceon dental arch form in orthodontic patients. Angle Orthod, 1998,68:445–454.
Knott VB. Longitudinal study of dental arch widths at four stages of dentition. Angle Orthod, 1972,42:387-94.
Bishara SE, Jakobsen JR, Treder J, Nowak A. Arch width changes from 6 weeks to 45 years of age. Am J Orthod Dentofacial Orthop, 1997,111:401-9.
Knott VB. Size and form of the dental arches in children with good occlusion studied longitudinally from age 9 years to late adolescence. Am J Phys Anthropol, 1961,19:263-84.
Bishara SE, Treder JE, Damon P, Olsen M. Changes in the dental arches and dentition between 25 and 45 years of age. Angle Orthod, 1996,66:417-22.
Haralabakis NB, Sifakakis I, Papagrigorakis M, Papadakis G. The correlation of sexual dimorphism in tooth size and arch form. World J Orthod, 2006,7:254-60.
Mutinelli S, Manfredi M, Cozzani M. A mathematic-geometricmodel to calculate variation in mandibular arch form. Eur J Orthod,2000,22:113–125.
DeKock WH. Dental arch depth and width studied longitudinally from 12 years of age to adulthood. Am J Orthod,1972, 62: 56-66.

Bishara SE, Jakobsen JR, Treder JE, Stasi MJ. Changes in the maxillary and mandibular tooth size-arch length relationship from early adolescence to early adulthood. A longitudinal study. Am J Orthod Dentofacial Orthop.1989,95:46-59.
Harris EF. A longitudinal study of arch size and form in untreated adults. Am J Orthod Dentofacial Orthop,1997,111:419-427.
Shrestha RM, Bhattarai P. Dental arch length and arch symmetry analysis of Nepalese permanent dentition. J Nep Dent Assoc,2009,10:110-114.
Shrestha RM, Bhattarai P. Dental arch circumference of Nepalese adults: A dimorphic study. Dent Nepal,2008,3:52-3.
Barrett MJ, Brown T, Macdonald MR. Size of dental arches in a tribe of Central Australian aborigines. J Dent Res 1965,44:912-20.
Huang ST, Miura F, Soma K. A dental anthropological study of Chinese in Taiwan (2). Teeth size, dental arch dimensions and forms. Gaoxiong Yi Xue Ke Xue Za Zhi 1991,7:635-43.
White LW. Accurate arch discrepancy measurements. AmJ Orthod. 1977,72:303-8.
Lavelle CLB, Plant CG. Comparison between the right and left sides of the dental arch. J Dent Res 1969,48:971.
Bishara SE, Jakobsen JR, Treder JE, Stasi MJ. Changes in the maxillary and mandibular tooth size-arch length relationship from early adolescence to early adulthood. A longitudinal study. Am J Orthod Dentofacial Orthop. 1989,95:46-59.

Table I: Distribution of studied sample according to sex (Maxillary arch)

		Parameters	Genders	N	Mean, mm/cm?	SD	t-value	p-value
Maxilla	Mixed dentition	I-C Right	Male	25	18.532	0.243567	6.38	0.000
			Female	25	18.1116	0.221222		
		I-C Left	Male	25	18.5484	0.375185	6.55	0.000
			Female	25	17.8988	0.323707		
		C-M Right	Male	25	23.3776	0.847419	2.65	0.011
			Female	25	22.7524	0.834263		
		C-M Left	Male	25	22.7016	0.589058	4.26	0.000
			Female	25	22.0016	0.570648		
		Perimeter	Male	25	83.1596	1.556592	5.54	0.000
			Female	25	80.7644	1.496541		
	Permanent dentition	I-C Right	Male	25	19.8864	0.530847	2.99	0.004
			Female	25	19.4576	0.479473		
		I-C Left	Male	25	20.4936	0.466421	3.11	0.003
			Female	25	20.0944	0.440635		
		C-M Right	Male	25	21.8344	1.151253	1.78	0.081
			Female	25	21.2472	1.175594		
		C-M Left	Male	25	21.5384	1.434264	1.59	0.118
			Female	25	20.9004	1.403355		
		Perimeter	Male	25	83.7528	3.367387	2.17	0.035
			Female	25	81.6996	3.307076		

Table II: Distribution of the studied sample according to sex (Mandibular arch)

		Parameters	Genders	N	Mean	SD	t-value	p-value
Mandible	Mixed dentition	I-C Right	Male	25	14.0408	0.607014	2.83	0.007
			Female	25	13.5528	0.61055		
		I-C Left	Male	25	13.8508	0.367411	4.42	0.000
			Female	25	13.3972	0.357695		
		C-M Right	Male	25	23.3468	0.629767	4.307	0.000
			Female	25	22.5688	0.647465		
		C-M Left	Male	25	23.2252	0.684069	3.89	0.000
			Female	25	22.4772	0.673495		
		Perimeter	Male	25	74.4636	1.456597	4.95	0.000
			Female	25	71.996	1.477346		
	Permanent dentition	I-C Right	Male	25	14.76	0.56899	2.68	0.010
			Female	25	14.3132	0.605273		
		I-C Left	Male	25	14.8308	0.390341	4.24	0.000
			Female	25	14.3524	0.405794		
		C-M Right	Male	25	22.1868	0.400414	6.77	0.000
			Female	25	21.3956	0.425069		
		C-M Left	Male	25	21.298	0.340771	7.75	0.000
			Female	25	20.5612	0.331151		
		Perimeter	Male	25	73.0756	0.741845	11.78	0.000
			Female	25	70.6224	0.729893		

Table III: Comparison between the right and the left sides of the studied sample

		Parameters		Mean	n	SD	t-value	p-value
Maxilla		I-C	Right	18.3218	50	0.31323	1.58	0.119
			Left	18.2236	50	0.477407		
	Mixed dentition	I-M	Right	38.518	50	0.58327	1.07	0.289
			Left	38.6436	50	0.586114		
		C-M	Right	23.065	50	0.890135	7.13	0.000
			Left	22.3516	50	0.674129		
		I-C	Right	19.672	50	0.545464	11.48	0.000
			Left	20.294	50	0.492246		
	Permanent dentition	I-M	Right	38.1832	50	1.110425	8.34	0.000
			Left	38.7406	50	1.469279		
		C-M	Right	21.5408	50	1.189132	5.38	0.000
			Left	21.2194	50	1.440837		
		I-C	Right	13.7968	50	0.651004	1.37	0.17
			Left	13.624	50	0.425762		
	Mixed dentition	I-M	Right	30.7912	50	7.524693	2.55	0.014
			Left	33.3932	50	0.815236		
		C-M	Right	22.9578	50	0.744307	1.904	0.063
			Left	22.8512	50	0.770779		
		I-C	Right	14.5366	50	0.623648	1.123	0.267

Mandible			Left	14.5916	50	0.462241		
	Permanent dentition	I-M	Right	33.1722	50	0.600976	4.402	0.000
			Left	33.0042	50	0.588547		
		C-M	Right	21.7912	50	0.571595	8.61	0.000
			Left	20.9296	50	0.499077		

Table IV: Arch differences of the study sample in mixed and permanent dentition

	Parameters			Mean	N	SD	t-value	p-value
Mixed dentition	I-C	Right	Upper	18.3218	50	0.31323	53.53	0.000
			Lower	13.7968	50	0.651004		
		Left	Upper	18.2236	50	0.477407	76.08	0.000
			Lower	13.624	50	0.425762		
	I-M	Right	Upper	38.518	50	0.58327	7.29	0.000
			Lower	30.7912	50	7.524693		
		Left	Upper	38.518	50	0.58327	34.008	0.000
			Lower	33.3932	50	0.815236		
	C-M	Right	Upper	23.065	50	0.890135	0.777	0.441
			Lower	22.9578	50	0.744307		
		Left	Upper	22.3516	50	0.674129	4.126	0.000
			Lower	22.8512	50	0.770779		
	Perimeter	Upper		81.962	50	1.93578	38.65	0.000
		Lower		73.2298	50	1.91351		
Permanent dentition	I-C	Right	Upper	19.672	50	0.545464	43.302	0.000
			Lower	14.5366	50	0.623648		
		Left	Upper	20.294	50	0.492246	114.61	0.000
			Lower	14.5916	50	0.462241		
	I-M	Right	Upper	38.1832	50	1.110425	35.02	0.000
			Lower	33.1722	50	0.600976		
		Left	upper	38.7406	50	1.469279	34.63	0.000
			Lower	33.0042	50	0.588547		
	C-M	Right	upper	21.5408	50	1.189132	1.56	0.123
			Lower	21.7912	50	0.571595		
		Left	upper	21.2194	50	1.440837	1.311	0.196
			Lower	20.9296	50	0.499077		
	Perimeter	upper		82.7262	50	3.4621	25.96	0.000
		Lower		71.849	50	1.437268		

Table V: Differences of study sample in mixed and permanent dentition

Parameters				Mean	N	SD	t-value	p-value
Maxilla	I-C	right	MD	18.3218	50	0.31323	15.57	0.000
			PD	19.672	50	0.545464		
		Left	MD	18.2236	50	0.477407	33.05	0.000
			PD	20.294	50	0.492246		
	I-M	Right	MD	38.518	50	0.58327	1.805	0.077
			PD	38.1832	50	1.110425		
		Left	MD	38.6436	50	0.586114	0.53	0.59
			PD	38.7406	50	1.469279		
	C-M	Right	MD	23.065	50	0.890135	10.33	0.000
			PD	21.5408	50	1.189132		
		Left	MD	22.3516	50	0.674129	8.11	0.000
			PD	21.2194	50	1.440837		
	Perimeter	MD		81.962	50	1.93578	1.96	0.055
		PD		82.7262	50	3.4621		
Mandible	I-C	Right	MD	13.7968	50	0.651004	10.79	0.000
			PD	14.5366	50	0.623648		
		Left	MD	13.624	50	0.425762	12.25	0.000
			PD	14.5916	50	0.462241		
	I-M	Right	MD	30.7912	50	7.524693	2.28	0.026
			PD	33.1722	50	0.600976		
		Left	MD	33.3932	50	0.815236	7.61	0.000
			PD	33.0042	50	0.588547		
	C-M	Right	MD	22.9578	50	0.744307	10.307	0.000
			PD	21.7912	50	0.571595		
		Left	MD	22.8512	50	0.770779	21.79	0.000
			PD	20.9296	50	0.499077		
	Perimeter	MD		73.2298	50	1.91351	8.98	0.000
	Perimeter	PD		71.849	50	1.437268		

MD= Mixed Dentition
PD= Permanent Dentition