

Inclination of lower teeth

Hussein A AL-OBEIDI*
Zaid B AL-DEWACHI**

ABSTRACT

This is the first study carried out in Iraq to determine the reliability of using new technique to assess inclination of lower permanent teeth as an indicator to assess position of the teeth before and after orthodontic treatment with orthopantomograph.

A total (259) students select randomly from Mosul university only (34) students (16 males, 18 females) between (18–25 years old) were of Iraqi origin who fulfilled the criteria of the sample. We found no significant differences (95% confidence level) of mean values of inclination of the teeth between male and female, with a significant difference between right and left sides for both sexes.

Key Words : Orthopantomograph , tracing paper ,inclination of the teeth.

الخلاصة

تعتبر هذه الدراسة الأولى من نوعها في العراق لتبين ملائمة الطريقة الحديثة لتحديد ميلان الأسنان الدائمة السفلى كأساس لتحديد موقع هذه الأسنان قبل وبعد العلاج التقويمي بواسطة استخدام الأشعة المرسومة.

من مجموع (٢٥٩) طالب اختيروا عشوائياً من جامعة الموصل . فقط (٣٤) طالب (١٦) ذكر و(١٨) أنثى في عمر (١٨-٢٥) سنة من أصل عراقي تنطبق عليهم شروط البحث .
مع حد الثقة (٩٥%)، لا يوجد اختلاف معنوي في مقدار معدل ميلان الأسنان بين الذكور والإناث مع وجود اختلاف بين جهتي اليمين واليسار لكلا الجنسين .

*Hussein Ahmad AL-OBEIDI; BDS, MSc: Assistant Prof.

**Zaid Burhan AL-DEWACHI : BDS, MSc: Assistant lecturer .

Department of Pedodontics, Orthodontics and Preventive Dentistry, College of Dentistry,
University of Mosul, Mosul, IRAQ.

INTRODUCTION

The occlusion is a complex subject with three space dimension (Antero-posterior, vertical, and lateral) in addition to the time factor, it's a dynamic problem as it changes all its specification with age^(1,2). It was demonstrated that the proper axial inclination had essential role in maintaining stable results of orthodontic treatment were found in cases in which there crowns and roots were correctly positioned in upright and parallel position⁽³⁾. The importance of positioning the teeth with proper angulation, like central incisor and lateral incisor with (5,9°) respectively are necessary to satisfy their contact point, aesthetic, functional requirements and occupy sufficient arch length^(4,5). The axes of teeth are not a straight lines, but curved lines and each one of them is represented by an arc passing distally from the occlusal plane to the root apex i.e. teeth are presented with varying degrees of mesial inclination⁽⁶⁾. The axial inclination of lower teeth adopted in a concave plane in relation to the incisal and occlusal surfaces⁽⁷⁾. The long axes of the teeth are not at right angle to horizontal plane⁽⁸⁾. Radiographs with different types like periapical and Bitewing to investigate root parallelism in orthodontically closed extraction sites⁽³⁾. The common method for establishing mesiodistal axial inclination is with using orthopantomograph⁽⁹⁻¹⁵⁾.

This study an attempt to assess the inclination of lower teeth with a new technique and comparing the results with other common techniques.

MATERIALS AND METHODS

Sample: A total of (259) student has been selected randomly from (4) colleges from Mosul university, only (34) students were selected (16 males, 18 females) of Iraqi origin from the Mosul city who fulfilled the criteria of the sample specification, all of them of class (I), normal occlusion, permanent dentition (between 18–25 years)⁽¹⁶⁾, with normal overjet, overbite (2–4 mm)⁽¹⁷⁾, with no extraction, abnormality of the teeth, or shifting in the upper or lower midline.

Method: Orthopantomograph were taken for thirty four students with anodic voltage (75–85) Kvp and anodic current of (15) mA. With exposure time of (15) seconds (Siemens orthopantomograph 10). For proper viewing all radiographs were traced (tracing paper 18 × 24 cm) in a dark room not more than (3) radiographs were traced each day in order to reduce the factor of decreasing visual acuity.

Land mark specification (figure 1)

1. A point: represent the center of mesial contact point on proximal tooth surfaces.
2. R point: represent the most mesial point of mesial root of molars teeth, and single roots of other premolars and anterior teeth in the apical third parts.
3. S point: mental foramen: the center of the mental foramen as observed by orthopantomograph⁽¹⁾.
4. H.R.L: Horizontal reference line: the connection between right and left mental center as observed on radiographs.
5. V.R.L: Vertical reference line: represent by a line formed between (A) point and (R) point in it's longest extent.

The mesial angles formed by vertical R. line and horizontal R. line were then measured from each radiographs.

Statistical analysis: means, standard deviation, t-test are done for all measurements.

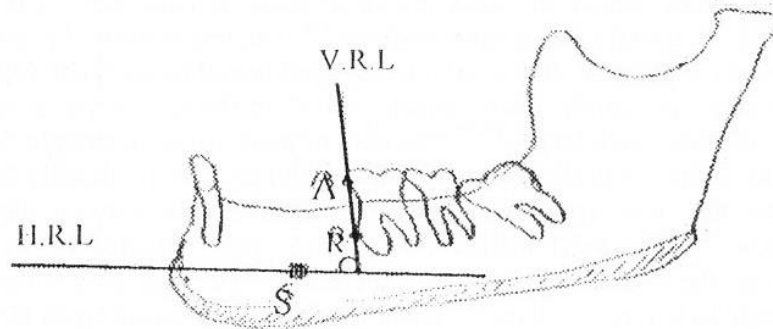


Figure (1): Tangential inclination of lower permanent first molar

RESULTS AND DISCUSSION

Tables (1) and (2) show the mean values of inclination of lower teeth in males and females. The results show no significant differences in right and left side comparison at significant level (0.05) for both sexes only for laterals, canines and premolars.

Table (1): Right-left side comparison of inclination of lower female teeth

Tooth No.	Side	Mean	SE Mean	T-Test
1	R	85.94	0.55	2.18
	L	83.61	0.92	
2	R	86.56	0.79	* 2.8
	L	83.11	0.94	
3	R	85.94	1.1	* 4.77
	L	78.83	1.0	
4	R	83.00	2.0	* 2.78
	L	76.67	1.0	
5	R	79.06	1.0	* 3.90
	L	73.39	1.0	
6	R	68.67	1.3	0.57
	L	69.50	0.58	
7	R	63.28	0.88	0.57
	L	62.33	1.4	

* Mean significant differences at 0.05 level .

Table (2): right – left of inclination of lower male teeth

Tooth No.	Side	Mean	SE Mean	t – test
1	R	84.69	0.82	1.61
	L	82.81	0.83	
2	R	85.69	0.54	* 2.42
	L	82.00	1.4	
3	R	86.37	1.6	* 3.40
	L	79.25	1.4	
4	R	84.6	2.6	* 2.91
	L	76.5	1.1	
5	R	79.25	1.5	* 3.91
	L	71.87	1.1	
6	R	72.06	1.1	1.06
	L	70.38	1.2	
7	R	61.00	1.8	0.73
	L	59.06	2.0	

* Mean significant differences at 0.05 level.

The measurement of inclination of teeth become more dissimilar as one move posteriorly in the arch , they attributed their results due to the greater variability of the shape and transverse dimension of the posterior teeth ⁽⁹⁾. This difference could be due to the variation in sequence of eruption which may affect inclination of the teeth.

Tables (3) and (4) show comparison in inclination of lower teeth between males and females for both sided with no significant differences between them.

Table (3): Male–female comparison in inclination of lower right teeth

Tooth No.	Sex	Mean	SE mean	t – test
1	M	84.69	0.82	1.25
	F	85.94	0.55	
2	M	85.69	0.54	0.91
	F	86.56	0.79	
3	M	86.37	1.6	0.23
	F	85.94	1.0	
4	M	84.6	2.6	0.48
	F	83.0	2.0	
5	M	79.25	1.5	0.11
	F	79.06	1.0	
6	M	72.06	1.1	1.98
	F	68.67	1.3	
7	M	61.00	1.8	1.13
	F	63.28	0.88	

Table (4): Male-female comparison in inclination of lower left teeth

Tooth No.	Sex	Mean	SE Mean	t - test
1	M	82.81	0.83	0.64
	F	83.61	0.92	
2	M	82.00	1.4	0.65
	F	83.11	0.94	
3	M	79.25	1.4	0.24
	F	78.83	1.1	
4	M	76.5	1.1	0.11
	F	76.67	1.0	
5	M	71.87	1.1	1.0
	F	73.39	1.0	
6	M	70.38	1.2	0.67
	F	69.50	0.58	
7	M	59.06	2.0	1.36
	F	62.33	1.4	

Table (5) shows comparison of this study with the study carried out by Ursi *et al.* This study revealed that the mean values of inclination of teeth of the present study were smaller than those shown in Ursi *et al.* study. These differences may be attributed to the difference in the method, technique of the study.

Table (5): Comparative inclination of lower teeth by two techniques

Tooth No.	Ursi study		Present study
	Side	Mean	Mean
1	R	91.75	85.31
	L	89.12	83.21
2	R	92.5	86.12
	L	90.75	82.5
3	R	87.25	86.15
	L	85.75	79.04
4	R	84.50	83.8
	L	83.75	76.5
5	R	92.5	79.15
	L	88.5	72.63
6	R	87.5	70.36
	L	81.37	69.94
7	R	77.37	62.14
	L	73.37	60.69

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