

Evaluation of the relation between occlusal vertical dimension with lingual frenum and depth of muco lingual reflection in Iraqi adult sample

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ABSTRACT

Back ground: The exact measurement of the natural vertical dimension is most essential in the successful practice of many phases in dentistry, this study was performed to evaluate the use of anterior attachment of lingual frenum and the depth of mucolingual reflection when recorded during function as a pre- extraction record to determine the occlusal vertical dimension (OVD) in edentulous patients.

Materials and methods: The sample consisted of 30 dentate subjects, the age was ranged from (23-33) years old, irreversible impressions of lower arches, stock trays, dental stone, surveyor and vernia gauge for measurements, the vertical distance between the incisal edge of mandibular central incisor and the anterior attachment of lingual frenum as well as the depth of mucolingual reflection was measured on the stone casts, t-test and one way analysis of variance were used for statistical analysis of the data.

Results: The difference between males and females regarding the distance from the incisal edge of mandibular central incisor and the anterior attachment of lingual frenum was statistically not significant ($p>0.05$) , also gender had no effect on the measurements of the distance from the incisal incisal edge of mandibular central incisor and muco lingual reflection depth.

Conclusion: The distance between the incisal edge of mandibular central incisor and the anterior attachment of lingual frenum with the depth of muco lingual reflection may be used as a reliable land marks to determine occlusal vertical dimension.

Key words: Occlusal vertical dimension, anterior teeth measurements, lingual frenum. (J Bagh Coll Dentistry 2009; 21(2):44-47)

INTRODUCTION

Determination of occlusal vertical dimension (OVD) is one of the most important steps in making dentures ⁽¹⁾.

Vertical jaw relation is the length of the face as determined by the amount of separation of the jaws, it can also be defined as the amount of separation between maxilla and mandible in a frontal plane ⁽²⁻⁶⁾. To make a successful denture, the establishment of correct vertical dimension is generally agreed to be one of the most important step in denture construction from standpoint of function, esthetic and phonetics ⁽³⁾.

Various techniques were used to determine vertical dimension of occlusion like maximum biting force ⁽⁷⁾ , swallowing method ⁽⁸⁾ , functional factor of phonetics with pronouncing f ,v and s ⁽⁹⁾ , cephalometric radiograph ⁽¹⁰⁾ , lip length and amount of coverage of the maxillary central incisor ⁽¹¹⁾.

It is frequently possible to see the patient before he or she becomes edentulous, in such cases, one can usually establish the occlusal position, record it in some manner and transfer this record to the edentulous situation .The use of pre-extraction records is quite helpful in determining and establishing the vertical dimension of occlusion in edentulous patients ^(4,12).

Pre-extraction measurements from the incisal edges of lower anterior teeth to the anterior attachment of lingual frenum and depth of mucolingual reflection have been suggested as means of establishing vertical dimension for complete denture fabrication ^(4, 5). Fayz ⁽⁴⁾ measured the distance from the depth of the mucolabial reflectin of the lower lip to the tip of the mandibular incisors and canines. The average distance was calculated to be 16.54 mm in the mandibular region.

This study determined the relation of natural teeth to the lingual frenum and to the depth of mucolingual reflection in Iraqi sample.

MATERIALS AND METHODS

Thirty subjects, 15 males and 15 females, with average age is 28 years old were selected.

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They had all their natural anterior teeth, a few had one or two posterior teeth missing but had a posterior occlusal stop and without anterior teeth shifting, patients who had attrition or undergone major orthodontic treatment were not included.

Three impressions were taken for each subject using irreversible hydrocolloid material, after the material had set; the impression was removed and poured with dental stone. The stone casts were placed on the survey table (tilt top and model clamp on Ney surveyor) with the occlusal plane of the cast parallel to the horizontal surveyor base.

The vertical arm of the surveyor was lowered until the tip of the analyzing rod contacted the lower pencil mark which is referred to anterior attachment of the lingual frenum (AALF) as shown in figure 1 and horizontal mark was made with a pen on the vertical arm, then we move the vertical arm of the surveyor until contact the incisal edge of the right mandibular central incisor and another horizontal mark was made with a pen, the distance between the 2 horizontal marks was measured by vernia gauge as shown in figure 2, also the depth of mucolingual reflection in the region of mandibular anterior teeth(from the mucolingual vestibule to the incisal edge of right mandibular incisor) was measured by using the same method.

The mean values for the measurements were calculated, student t-test and one way analysis of variance (ANOVA) were employed for statistical analysis of the data.



Figure 1: Determination of the anterior attachment of lingual frenum by using the analyzing rod of dental surveyor.

RESULTS

G1 is referred to the distance between the anterior attachment of lingual frenum and incisal edge right mandibular central incisor. G2 is referred to the distance between the depth of

mucolingual reflection and the incisal edge right mandibular central incisor.



Figure 2: The distance between two horizontal lines on the vertical arm of dental surveyor was measured by using vernia gauge.

Data presented in table 1 and 2 showed the mean values of measurements of G1. The difference between the three cast readings was statistically insignificant also insignificant difference was found between the genders for G1 as shown in figure 3 and figure 4.

Table 3 and 4 showed that there was statistically insignificant difference among the three cast readings related to the mean distance from mucolingual reflection to the incisal edge of mandibular central incisor ($p>0.05$), as well as insignificant relation was found among genders for G2 as shown in figure 5 and 6.

Table 1: Mean and SD of the distance from the AALF to incisal edge of mandibular central incisor related to three cast readings.

	cast1	cast2	cast3
Mean	10.617	10.83	10.917
SD	1.525	1.353	1.285

ANOVA table F-test=0.37 P=0.692 P>0.05 NS

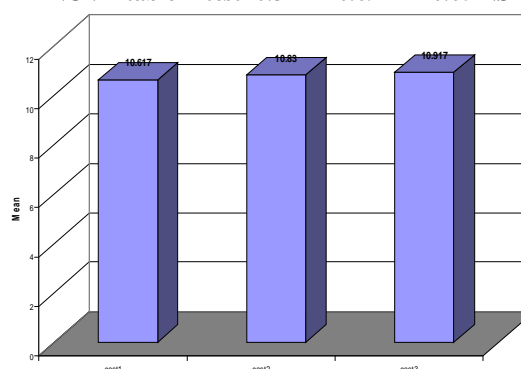


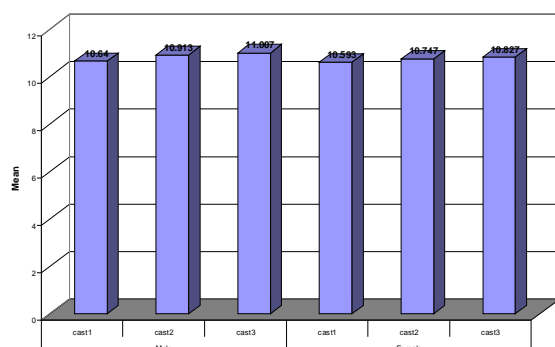
Figure 3: Mean distance from the AALF to incisal edge of mandibular central incisor.

Table 2: Mean and SD of the distance from the AALF to incisal edge of mandibular central incisor related to gender.

	Female			Male		
	cast1	cast2	cast3	cast1	cast2	cast3
Mean	10.64	10.913	11.007	10.593	10.747	10.827
SD	1.465	1.277	1.188	1.633	1.465	1.411
Mean	10.9			10.7		

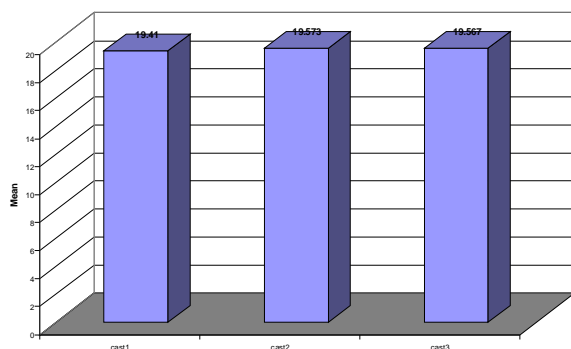
ANOVA table of female F-test=0.31 P=0.732 P>0.05
NS

ANOVA table of male F-test=0.09 P=0.911 P>0.05 NS
T-test between male and female =0.26 p=0.79 p>0.05
NS of G1.

**Figure 4: Mean distance from the AALF to incisal edge of mandibular central incisor related to gender****Table 3: Mean and SD of the distance from the depth muco lingual reflection to incisal edge of mandibular central incisor related to three cast readings.**

	cast1	cast2	cast3
Mean	19.41	19.573	19.567
SD	1.437	1.471	1.475

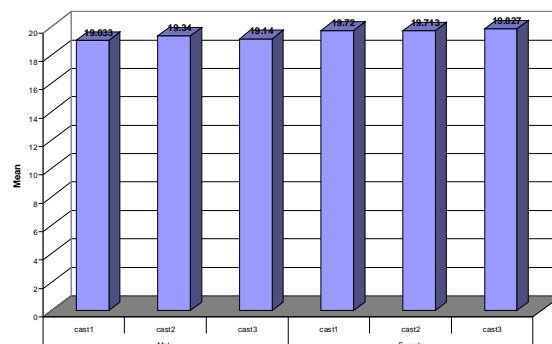
ANOVA table F-test=0.12 P=0.887 P>0.05 NS

**Figure 5: Mean distance from the depth muco lingual reflection to incisal edge of mandibular central incisor****Table 4: Mean and SD distance from the depth muco lingual reflection to incisal edge of mandibular central incisor related to gender.**

	Female			Male		
	cast1	cast2	cast3	cast1	cast2	cast3
Mean	19.033	19.34	19.14	19.72	19.713	19.827
SD	1.3937	1.4045	1.3394	1.4443	1.5766	1.5545
Mean	19.2			19.8		

ANOVA table of female F-test=0.19 P=0.732 P>0.05
NS

ANOVA table of male F-test=0.09 P=0.911 P>0.05
NS
T-test between male and female =1.13 p=0.27 p>0.05
NS of G2.

**Figure 6: Mean distance from the depth muco lingual reflection to incisal edge of mandibular central incisor related to gender**

DISCUSSION

The results of this study point to some guides that can be used in positioning artificial teeth.

Because the position of the incisal edges of mandibular incisors was stable, the position of the AALF can be considered relatively stable when the frenum was recoded during function. Consequently when measurements are made on pre extraction diagnostic casts from AALF to the incisors of mandibular central incisors, then the vertical height of maxillary and mandibular wax occlusion rims are adjusted anteriorly to correspond with these measurements.

The mucolingual reflection is a useful reference because it approximates the border of the denture. It can be used as a guide in the antero posterior positioning of the anterior teeth and in determining the vertical distance of the teeth from the vestibule. The mean value of G1 was 10.7 mm in males and 10.9 mm in females as shown in table 2. Bissasu⁽⁵⁾ found that the mean measurements of G1 were 10.26 mm generally.

The measurements of G2 were 19.8 mm in males and 19.2 mm in females respectively as shown in table 4. Although the mean distance was slightly less in females, no statistically significant

gender related difference was noted ($p>0.05$), this findings in agreement with Fayz⁽⁴⁾.

The variations between the present study and other studies may to some extent be explained by differences in measuring techniques in addition, the anatomical variation between the individuals is considerable.

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