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Relationship between Labial Surface of Maxillary Central Incisor and Incisive Papillae (Survey during Try-in Stage)

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Abstract: ***Complete denture prosthodontics: involves an artificial replacement of the lost natural dentition and associated structures of the maxilla and mandible for patient who has lost all their remaining natural teeth. In complete denture, maxillary anterior teeth play an important role in providing lip support and labial contour. The incisive papilla otherwise known as palatine papilla is a small pear oval shaped mucosal prominence situated at the midline of the palate, posterior to the palatal surface of the central incisors. The incisive papilla central incisor distance based on the dentulous biometric norm is a guide to form labial contour of occlusal rim in laboratory, which is later confirmed chairside by the clinician and subsequently to set upper central incisors in the dental arch. Aim of study: this study is done to explain if there is difference in position of anterior teeth in male and female, if we can consider incisive papilla as biometric guide in position of anterior teeth and the difference in incisive papilla central incisor relationship in dentulous and edentulous subjects. Materials and method: The sample consist of 80 subjects as a control group and 90 cases as a survey group and the distance between there incisive papilla and central incisor was measured with vernier caliber. Result: t-test is done to the total cases in this study and the result is 2.02 while the probability result is o.o49 which have significant difference. Conclusion: In the absence of pre-extraction records, the incisive papilla is an anatomic landmark that can be used as an aid for anterior tooth positioning in edentulous men patients while in female we could not consider it as a biometric guide.***

Keywords: Prosthodontics, incisive papilla, complete denture, central incisor.

1. Introduction

Prosthetics: is the art and science of designing and fitting artificial substitutly to replace lost teeth or missing tissue [1].

Prosthodontics (dental prosthetics): Is the branch of dental art and science which with the replacement of missing teeth and oral tissue to restore and maintain oral form, function, appearance, phonetics and health.

Complete denture prosthodontics: involves an artificial replacement of the lost natural dentition and associated structures of the maxilla and mandible for patient who has lost all their remaining natural teeth. The advantages of complete denture are:

1) Mastication: chew food for swallowing and digestion [1].
2) Speech (phonetics): the teeth either natural or artificial assist the tongue.
3) Appearance (aesthetic): the complete denture should restore the lost facial contours, vertical dimension, etc [2].
4) The position and occlusal relationship of the teeth.

In complete denture, maxillary anterior teeth play an important role in providing lip support and labial contour. When placed too far posterior, then the upper lip is unsupported and there is loss of muscle tone. Contrarily, the lip is stretched when the anterior teeth are placed too far forward. The loss of muscle and tissue tone and stretching of lip affect facial expression and appearance. Positioning anterior teeth in the neutral zone in complete denture permits a balance of muscular forces between the upper lip and the tongue. However, this is more beneficial for the stability of the denture than providing a pleasing labial contour. The labial contour of a denture wearer as seen from front and in profile is initially achieved by the clinician while he builds and shapes the labial surface of upper occlusal rim at the time of jaw relation record. The incisive papilla central incisor distance based on the dentulous biometric norm is a guide to form labial contour of occlusal rim in laboratory, which is later confirmed chairside by the clinician and subsequently to set upper central incisors in the dental arch. As early as 1948 Harper stated ‘‘When artificial are set in proper position, which may be determined by the incisive papilla, the foundation is Correctly laid for natural speech, pleasing appearance and normal function [3].

The incisive papilla otherwise known as palatine papilla is a small pear oval shaped mucosal prominence situated at the midline of the palate, posterior to the palatal surface of the central incisors. In dentulous subjects, it is seen in various forms either discrete or continuous with the interdental papilla of the upper central incisors. In the edentulous maxilla it becomes round, present behind the crest of the residual ridge or on the tip of the ridge. Harper found the position of the incisive papilla in the edentulous remained fairly constant since resorption took place in an anteroposterior direction [3].

Progressive bone loss of the labial alveolar bone gives an illusion that the papilla has moved forward. Histologically it consists of firmly interwoven fibers of dense connective tissue and is believed to contain the oral parts of the vestigial nasopalatine ducts, which are blind epithelial ducts of varying lengths [4, 5]. It is lined by simple or pseudostratified columnar epithelium which is frequently

keratinized. The incisive papilla is generally situated over the incisive foramen through which emerge the nasopalatine nerves and palatine vessels. Watt and Likeman found that the papilla moved forward about 1.6 mm as a result of maxillary alveolar bone resorption and the incisive fossa lies slightly posterior to the papilla. Pressure on papilla by the maxillary denture can result in pain or burning sensation requiring relief [6].

2. Materials and method

2.1 The sample

For the control group, dentulous subjects of Iraqi origin consisting of 50 males and 30 females in the 24–45 age group were randomly selected for the purpose of measurement between the labial surface of the upper incisor teeth and the incisive papilla. These subjects attend Collage of Dentistry of Baghdad University and the measurements were done there. For survey group, edentulous patients of Iraqi origin consisting of 56 males and 34 females whose attend the prosthetic department of collage of dentistry of Baghdad University seek for treatment with complete denture were selected for the purpose of comparison with control group. The survey group in the trial stage of the complete denture treatment.

2.2 Materials and instruments

1) Masks and gloves
2) Towels.
3) Disposable trays.
4) Rubber bowel and spatula.
5) Alginate impression material.
6) Type 1 dental stone.
7) Marker pen.
8) Vernier caliper.

2.3 The method

Alginate impression of the upper arch was obtained for subjects with class 1 occlusion having normal arch form with full complement of anterior teeth, with good gingival and periodontal health, who fulfilled the selection criteria such as absence of caries, diastema, anterior restorations. Maxillary casts were made with Type 1 dental stone and the casts were used for further measurements. In each of the cast the incisive papilla and labial surface of central incisor are examined and the distance between them was measured with a Vernier caliper to the accuracy of tenth of a millimeter.

The middle of the incisive papilla and the most prominent labial convexity of the central incisor were taken as references for measuring the papilla incisor distance. A horizontal line was marked at the base of the incisive papilla. A second line was marked in the midsagittal plane to bisect the papilla. The point of intersection was taken as the reference point for measurement. Papilla-incisor distance was recorded to the tenth of a millimeter by adjusting the pointed arms of the Vernier caliper to contact the reference point at the middle of the incisive papilla and the maximum convexity of central incisor

Then we check the trial denture of the edentulous patients extraorally and then inside patient's mouth and check the appearance , lip support , vertical dimension then our work begin by taking the upper trial denture and check the fitted side on the incisive papilla area ,and then by using the same marker pen mention above we mark the most depress part of the incisive papillae and by using the Vernier caliper we measure the distant between the most depress part of the incisive papilla (the center part) and the most convex part of the upper artificial central incisor.

3. The Result

This survey is done by using control case study.

Table (1) represent the number of control cases are 80 divided into 50 male cases which represent 62.5 from all control case, and 30 female which represent 37.5.

The number of the survey cases 90 divided into 56 male case which represent 62.22 from all survey cases,and 34 female which represent 37.78.

Table 1: Number of cases in this study

Gender	Control group		Survey group	
	No.	%	No.	%
Male	50	62.5	56	62.22
Female	30	37.5	34	37.78
Total	80	100	90	100

By calculating the mean of each control group individually we found that the mean of male cases are 9.1 with standard deviation 1.296.

While in female are 7.69 with standard deviation 0.983.

The total mean of both males and females in control sample are 8.5 with standard deviation 1.399.

In survey cases we found that the mean of male cases are 8.7 with standard deviation 1.425.

While in females are 7.1 with standard deviation 1.122.

The total mean of both males and females in survey sample is 8.1 with standard deviation 1.519. As represent in Table (2).

Table 2: The mean and standard deviation of each group

Gender	Control group		Survey group	
	Mean	SD	Mean	SD
Male	9.1	1.296	8.7	1.425
Female	7.69	0.983	7.1	1.122
Total	8.5	1.366	8.1	1.519

The t-test gives the probability (p) that the difference between the two means is caused by chance. It is customary to say that if this probability is less than 0.05, that the difference is 'significant', the difference is not caused by chance.So in the table below t-test is done to the control cases and the result is 5.577 with probability smaller than 0.01 which is highly significant and t-test to the survey cases

and the result is 6.303 with probability smaller than 0.01 which is highly significant.as represent in Table (3).

Table 3: t-test and the probability of difference

	Control group	Survey group
T –test value	5.577	6.303
P	P<0.01	P<0.01
Sig	HS	HS

In Table (4) t-test is done to see the difference in both males and females cases in males cases the t-test result is 1.096 while p is 0.278 which is larger than 0.05 which is non-significant.

In female control case the t-test is 2.343 while p is 0.026 which is smaller than 0.05 so it is significant.

Table 4: t-test between male and female cases in both control and survey group

	Male	Female
t-test value	1.096	2.343
P	0.278	0.026
Sig	NS	S

In Table (5) t-test is done to the total cases in this study and the result is 2.02 while the probability result is o.o49 which have significantdifference.

Table 5: t-test to total control and survey cases

	Total
t-test value	2.02
P	0.049
Sig	S

4. Discussion

The mean distance from the labial surface of the central incisors to the midpoint of the incisive papillawas 8.5 ± 1.366 mm in control group while in survey cases the artificial anterior teeth are about 8.1 ± 1.519 from the center of the incisive papilla; This finding is within ranges noted in earlier studies depending on the midpoint of the incisive papilla was used for the measurementsin the complete dentures were placed further posteriorly as compared with natural teeth [7, 8, 9]. This was also noted in an earlier study that used calipers with modified tips. As were the cases in this study, we found significant Difference in the mean values for men and women in male. The artificial teeth are about 8.7 ± 1.425 from incisive papilla in male while in female 7.1 ± 1.122 and when we compare the result of each survey group with the result of the control group by doing t-test we found that in men the result is non-significant while in female the result is significant When attempting to place artificial teeth as close as possible to the positions previously occupied by natural teeth that may be due to resorption of the anterior part of the alveolar bone in female is more than that occur in male maybe due to hormone production and bone resorption [10, 11], and complete denture wearers in the distance from the central incisor to the incisive papilla [9]. None of our patients with complete denture who requested replacement dentures had any complaint relating to the aesthetics or phonetics of their dentures. This suggests that the positions of the anterior teeth in their dentures were satisfactory, even though they may not have been in the positions formerly occupied by their natural teeth.

Within the limitations of this study, we conclude that the biometric distance between the incisive papilla and the labial surface of the maxillary central incisors in dentate patients was not used as a guide in positioning artificial central incisors among wearers of complete Denture patients in this study. In addition, a mean distance of 8.1 ± 1.519 mm was commonly used in our sample of edentulous patients.

5. Conclusion

Various anatomical landmarks on the edentulous cast has been proposed as a guide to position the denture teeth at some distance and are called biometric guides. Biometric guides in the oral cavity are useful as aids in positioning artificial teeth, as they indicate the position of the natural teeth. However, changes in the oral musculature and skin area due to ageing and residual ridge resorption might need to be accommodated. In the absence of pre-extraction records, the incisive papilla is an anatomic landmark that can be used as an aid for anterior tooth positioning in edentulous men patients while in female we could not consider it as a biometric guide. During its transition to the edentulous state, incisive papilla changes its shape consequent to remodeling of the alveolar bone, palatal mucosa and interdental papilla following extraction of central incisor teeth. It was found that the papilla in dentate is not always round but seen in several forms. In some it was a double papilla and in a few it wasrudimentary. The center of the papilla also changes from its dentulous to edentulous state. The posterior border is a relatively stable landmark since it undergoes least change after extraction of anterior teeth.

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