

台灣地區上顎正中門齒與門齒 乳突距離之探討

在全口義齒的製作上，門齒乳突是決定上顎前齒位置的一個重要指標。本實驗的目的在找出台灣年輕族群上顎正中門齒、犬齒、門齒乳突三者之間的關係。

本實驗共蒐集 81 個診斷模型，分別量取門齒乳突正中點到上顎正中門齒唇側面的距離，其結果介於 7.18 與 11.51 公釐之間，平均為 9.21 公釐；上顎犬齒連線有 72.84% 會通過門齒乳突的中間三分之一，4.94% 會通過門齒乳突的後三分之一，22.22% 會通過門齒乳突的中間三分之一與後三分之一交界。本實驗的結果可作為台灣的牙醫師製作全口義齒、局部活動義齒、覆蓋式義齒及植牙義齒上顎蠟堤時的參考。

黃筱娟¹ 周肇茂¹ 李惠娥¹ 吳育琦¹
楊奕馨² 何振東¹ 黃培盛¹

1 高雄醫學大學附設中和紀念醫院牙科部
補綴科

2 高雄醫學大學口腔衛生科學研究所

關鍵字：門齒乳突、全口義齒、局部活動義齒、覆蓋式義齒、植牙義齒、蠟堤

聯絡人姓名：周肇茂 (Tsau-Mau Chou)
通訊處：高雄市十全一路 100 號
電話：07-3121101-7003
傳真：07-3210637

受文日期：民國九十三年一月二十日
接受刊載：民國九十三年二月二十一日

Exploring the distance between upper central incisor edge and incisive papilla in Taiwanese population

Sheau-Jiuan Huang¹, Tsau-Mau Chou¹, Huey-Er Lee¹, Yu-Chi Wu¹, Yi-Hsin Yang²,
Cheng-Don Ho¹, Pei-Sheng Huang¹

¹Department of Prosthodontics, Kaohsiung Medical University

²Graduate Institute of Oral Health Sciences, Kaohsiung Medical University

Incisive papilla is a significant anatomical landmark in locating upper anterior teeth position in partial or complete and implant prosthetic denture fabrication procedure. The objective of this study is to find the relationship of central incisor and canine to incisive papilla of Taiwanese population.

Eighty-one study casts are selected. All selected study casts are analyzed. The distance from the center of incisive papilla to the labial incisal one-third of central incisor is between 7.18 to 11.51 mm, with the mean of 9.21 mm; the line drawn between canines pass middle of the incisive papilla is 72.84%, and pass posterior of the incisive papilla is 4.94%, and 22.22% between middle and posterior of incisive papilla. The result of this study can be used as a guide line in fabrication of the maxillary occlusion rim in Taiwanese population.

Keywords: incisive papilla, complete denture, partial denture, overdenture, implant denture, occlusion rim

Correspondence: Tsau-Mau Chou

Address: 100, Shih-Chuan 1st Road, San Ming District, 807 Kaohsiung City, Taiwan.

TEL: 07-3121101-7003

FAX: 07-3210637

Submitted: January, 20, 2004

Accepted: February, 21, 2004



Introduction

In 1948, Harper suggested that the incisal edges of the upper central incisors should be 5 to 8 mm in front of the center of the papilla. He also discovered that the papilla cannot be depended upon as a guide in marking the mid-line in edentulous cases. In only 58% of the cases was the center of the papilla lined up with the center of the face. One of his conclusions was that the incisive papilla is a dependable basis for a technique designed to reproduce the horizontal and vertical position of the maxillary central incisor, today we still use the papilla to determine the horizontal position of the maxillary central incisor. Harper didn't give the number of cases that he used in his study. He also related the center of the incisive papilla to the canines. He drew a line from the center of the incisive papilla to the canines. He felt that if the line passed within the anterior half of the canines, the anterior arch will have a normal contour and when it passes through the distal half of the canine, then the arch will be flat ⁽¹⁾.

In 1960, McGee notes that the incisive papilla remains in a constant position after tooth loss. The lingual surface of natural maxillary central incisors touch the incisive papilla or is just anterior to it. The bucco-lingual measurement of the maxillary centrals ranged from 6.8 mm to 8.6 mm with an average of 7.7 mm. Since the centrals are slightly anterior to the center of the incisive papilla, he used 8 mm as the position of the labial surface for the

average patient. "This position may be altered in an anterior or posterior direction to meet the requirements of the individual patient ⁽²⁾."

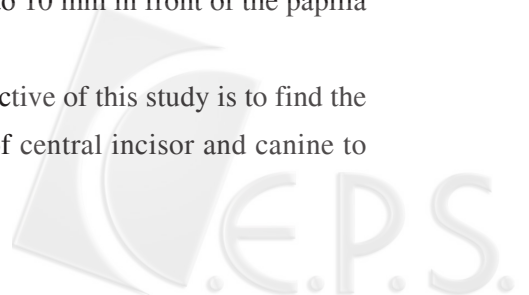
In 1964, Schiffman found that a line drawn through the center of the papilla to the canines, passed through the cusp tips 78% of the time. If you included an area of 1 mm anterior and 1 mm posterior to the center of the papilla you crossed the canine cusps 92% of the time ⁽³⁾.

In 1979, Ortman and Taso collected 38 casts in the sample. The average distance between the most anterior point of the maxillary central incisors and the most posterior point of the incisive papilla was 12.454 mm with a standard deviation of 3.867 mm. This distance was measured when these two points were projected on a plane parallel to the reference plane formed by the tips of three symmetrically located interdental papillae ⁽⁴⁾.

In 1987, Grave et al. founded that the incisive papilla provides a reference point on the edentulous cast that may be helpful in determining the anteroposterior position of the artificial incisors. The results of their study suggest that the labial surface of the maxillary incisors should be 12 to 13 mm from the posterior border of the incisive papilla ⁽⁵⁾.

In 2004, Aaron cited Eckert, who stated that the labial surfaces of the central incisors are usually 8 to 10 mm in front of the papilla ⁽⁶⁾.

The objective of this study is to find the relationship of central incisor and canine to



incisive papilla in Taiwanese population, because we can not find reliable data of Taiwanese population, and it can be used as a guide line in fabrication of maxillary occlusion rim in Taiwanese population.

Material and method

The study is composed of 81 dental casts (both jaws) with an average age of 22 years old. Subjects are currently dental school students of Kaohsiung Medical University. Casts were done in a standard way used by dentists. Because of the young age of the participants,

dental wear was none to minimum. All students were healthy and free from obvious problems that could disfigure or affect the face and dentition. They were from all around the Taiwan representing no specific region. Each subject was asked to keep the mouth half open as the impression material (alginate) on tray sets in for a few minutes. The cast was immediately filled with the Type III stone (Fig. 1).

We measure the distance of from the center of incisive papilla to the labial incisal one-third of central incisors (Fig. 2) by Digimatic

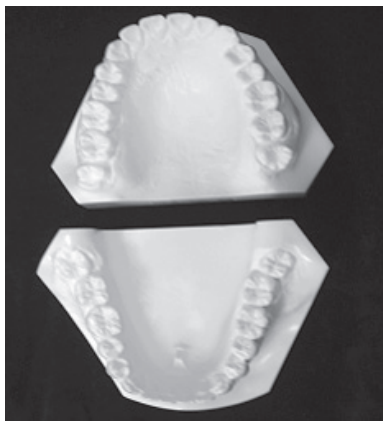


Fig1. Study cast

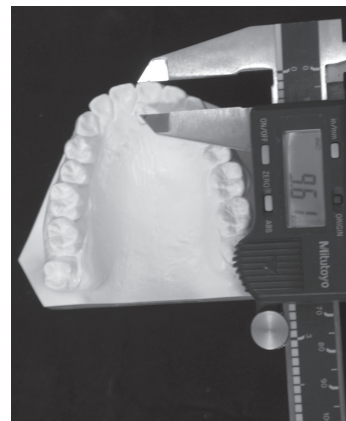


Fig2. measure the distance of from the center of incisive papilla to the labial incisal one-third of central incisor

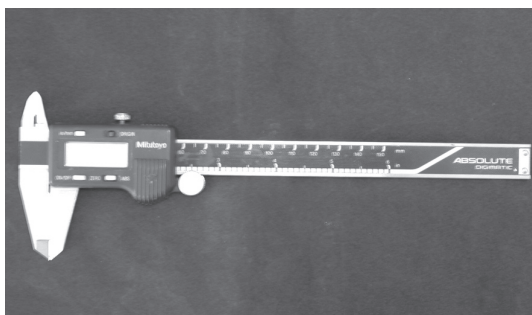


Fig3. Digimatic caliper (Mitutoyo corporation, Japan, sensitive to 0.01 mm)



Fig4. measure the line drawn between the canines pass middle, posterior, or between middle and posterior of the incisive papilla

caliper (Mitutoyo corporation, Japan, sensitive to 0.01 mm) (Fig. 3). We also measure the lines drawn between the canines pass middle, posterior, or between middle and posterior of the incisive papilla (Fig. 4), all measurements were done by the same authors, to assess intraobserver error. All data were analyzed with Excell 2000.

Results

The distance from the center of incisive papilla to the labial incisal one-third of central incisors is between 7.18 to 11.51 mm, with the mean of 9.21 mm (Table 1); the line drawn between canines pass middle of the incisive papilla is 72.84%, pass posterior of the incisive papilla is 4.94%, and 22.22% between middle and posterior of the incisive papilla (Table 2). The result of this study can be used

as a guideline in fabrication of maxillary occlusal rim for Taiwanese population.

Discussion

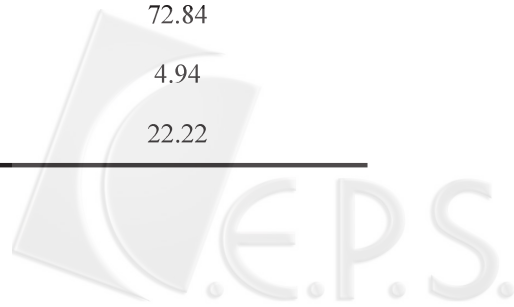
A common average position of the maxillary anterior teeth to constant landmarks has been found by measuring hundreds of casts of natural healthy teeth. Measurement of the distance from the incisal labial one-third of the maxillary central incisors to the center of incisive papilla can help us decided the upper anterior teeth position during denture fabrication. Incisive papilla is a pad of fibrous connective tissue overlying bony exit of nasopalatine blood vessels and nerves. It should not be compressed or displaced during impression making. Denture pressure on this can cause paresthesia or pain. During denture fabrication, central incisors should be 8-10

Table 1
Distance from the center of incisive papilla to the labial incisal one-third of central incisors

mm	7-7.49	7.5-7.99	8-8.49	8.5-8.99	9-9.49	9.5-9.99	10-10.49	10.5-10.99	11-11.49	11.5-11.99
Count	3	4	12	17	17	15	7	4	1	1
%	3.71	4.94	14.81	20.99	20.99	18.52	8.64	4.94	1.23	1.23

Table 2
The relationship of the upper canines and incisive papilla

Position	Count	%
middle	59	72.84
posterior	18	4.94
between	4	22.22



mm anterior to the midpoint of the incisive papilla ⁽⁷⁾.

The incisive papilla was simply considered as a protective covering for the incisive foramen. By considering preextraction and postresorption casts of the same person, Harper concluded that there is no change in the position or dimensions of the papilla from the dentate stage to the edentulous stage⁽¹⁾. The incisive papilla provides a reference point on the edentulous cast that may be helpful in determining the anteroposterior position of the artificial incisors. It is common to use the posterior border of the papilla as the part likely to be least affected by the changes in anatomy of the region ⁽⁵⁾.

Watt stated that "The average distance from the middle of the incisive papilla to the middle of the labial surface of the upper central incisor is approximately 10 mm; it is seldom less than 8 mm ⁽⁸⁾.

Alan said that the bases which carry the occlusion rims should be rigid and stable. The upper rim is modified to give correct lip support. The incisive papilla provides a useful biometric guide to the prominence of the rim, its center lying 8-10mm palatal to the labial surfaces of the maxillary central incisors (in the natural dentition). Patients' wishes, or previous satisfactory dentures, may dictate otherwise ⁽⁹⁾.

Many studies find that the distance from the center of incisive papilla to the labial incisal one-third of the central incisors is be-

tween 8 to 10 mm ^(1,2,4,5,6,7,8,9), in this study it also shows the similar result. Besides, 72.84% the line drawn between the canines pass middle of the incisive papilla, it means that the line drawn through the center of the papilla out to the canines, passed through the cusp tips of the time, and central incisors should be 8-10 mm anterior to the midpoint of the incisive papilla. Therefore, the dentists in Taiwan can use this result as a guide line in fabrication of the complete denture.

Conclusions

The fundamental results of this experiment can be served as the standards for the production and teeth selection of the complete denture, removable partial denture, overdenture and implant supported overdenture, the selected group of this experiment are Taiwanese youngsters between aged 21 to 24, and the results of this experiment are almost identical with the results gained from experiments testing on Caucasian group, the most plausible explanation is that after the World War II the Taiwanese are well-nourished, and nutrition is grate correlation with arch development. The further research is necessary on account that posterior arch width and anterior-posterior arch length are closely related with this experiment.

References

1. Harper, R.N., The incisive papilla. J Dent Res 1948; 27: 661-8.
2. McGee, G.F., Tooth placement and base contour in denture construction. J Prosthet Dent

- 1960; 10:651-7.
3. Schiffman, P. Relation of the maxillary canines to the incisive papilla. J Prosthet Dent 1964; 14:469-72.
 4. Ortman, H.R. and Tsao, D.H. Relationship of the incisive papilla to the maxillary central incisors. J Prosthet Dent 1979; 42: 492-6.
 5. Grave A.M.H. Evaluation of the incisive papilla as a guide to anterior tooth position. J Prosthet Dent 1987; 57: 712-4.
 6. Fenton A.H. Selecting and arranging prosthetic teeth and occlusion for the edentulous patient. In: Eckert. Jacob. Fenton A.H. Mericske-Stern, editors. Prosthodontic treatment for edentulous patients. 12th ed. St. Louis: Mosby; 2004. p. 310.
 7. Board review: Removable prosthodontics/ complete dentures
http://dental.columbia.edu/class_sites/sdos2006/class/prostho/removable/prosboard.pdf
 8. Watt, M.D. Designing Complete Dentures. Philadelphia: W.B. Saunders Co.; 1976.
 9. Alan Ogden Honorary Curator . Guidelines in Prosthetic and Implant Dentistry. London: Quintessence Publishing; 1996.

