

# PREFERRED METHODS FOR THE SELECTION OF ARTIFICIAL TEETH IN A COMPLETE DENTURE PATIENT IN A TERTIARY CARE HOSPITAL AT RAWALPINDI

<sup>1</sup>SALMA MUHAMMADI

<sup>2</sup>SYED HAMMAD HASSAN

<sup>3</sup>AZAD ALI AZAD

<sup>4</sup>MUBASHIR SHARIF

## ABSTRACT

*This study was conducted to find the most convenient method for the selection of teeth for complete denture patients between Consultant, Residents and House officers in prosthetic services. A questionnaire was designed specifically prepared and distributed to 45 dentists working in tertiary care hospitals in the twin cities of Rawalpindi and Islamabad. All participants answered questions and responded to the survey. Majority preferred patient's facial form as a guideline in choosing the shape of anterior denture teeth (40%), the most widely used guide in choosing the color of the front teeth was the tone of the patient's skin (48.9%), and more often appearance used in selecting the size of front teeth were the corners of the mouth (35.5%). Fifty-one percent of dentists prefer to use anatomical teeth for back teeth in prosthesis. Bulk of the participants (97.8%) preferred acrylic resin material for artificial teeth. It can be accomplished as the preferred method to opt for artificial teeth and general dentist in Rawalpindi and Islamabad agree with the approaches by dentists internationally, as evidenced by the data published on the subject.*

**Key Words:** Preferred methods, Teeth selection, Complete dentures.

## INTRODUCTION

Selection of teeth for prosthodontic rehabilitation is a complex task and it warrants sound understanding and knowledge of functional, esthetic and mechanical aspects of denture fabrication. In dental restorations, an acceptable cosmetic effect has always been considered important. A well-made functional prosthesis which falls short of patient's esthetic expectations may not be an acceptable outcome. The dentist must, therefore, give due consideration to the esthetics in relation to teeth selection and arrangement for optimal esthetic and functional outcome with respect to denture fabrication. This, however, varies considerably with the esthetic orientation and artistic abilities of the treating clinician.<sup>1</sup> As the esthetic abilities of clinicians may

vary significantly there is a set of general guidelines for clinicians for selection of prosthetic teeth. However, there is inadequate scientific data available in the dental literature in terms of how these guidelines are used by different dentists when it comes to final selection of prosthetic teeth.<sup>2</sup>

The dimension, shade, morphology and material of the artificial teeth are the various aspects which need to be carefully considered as they play an important part in achieving desirable esthetics in complete dentures. For the selection of dimension of the anterior teeth various biometric guidelines like inter-alar distance, inter-canthal distance, bi-zygomatic width, inter-canine width etc are commonly employed. However, there is no unanimous consensus as yet on any single method for selection of anterior teeth dimensions.<sup>3</sup> For instance in a study by Ahila et al a total of about 50 people were evaluated and the width of the maxillary and mandibular anterior teeth were compared with the length of the index and little fingers. They found a positive association between the maxillary and mandibular anterior teeth with the length of index and small finger so much so that they devised definitive formulas for anterior teeth size selection for maxilla and mandible.<sup>3</sup>

<sup>1</sup> Dr Salma Muhammadi, BDS, FCPS Resident Prosthodontics, Armed Forces Institute of Dentistry, Rawalpindi

<sup>2</sup> Dr Syed Hammad Hassan, BDS, FCPS, Assistant Professor of Prosthodontics, Armed Forces Institute of Dentistry, Rawalpindi  
**For Correspondence:** <sup>3</sup>Dr Azad Ali Azad, BDS, MCPS, FCPS, \ Professor of Prosthodontics, Armed Forces Institute of Dentistry, Rawalpindi Cell: 0321-5178242  
E-mail: pakprosthodontist@hotmail.com

<sup>4</sup> Dr Mubashir Sharif, BDS, FCPS, Assistant Professor of Prosthodontics, Armed Forces Institute of Dentistry, Rawalpindi

**Received for Publication:** January 30, 2016

**Revised:** February 29, 2016

**Approved:** March 1, 2016

Similarly, several methods are used to choose the form of anterior teeth. Some of these include recordings before extracting teeth as photographs, study models, extracted teeth, pre-existing prosthesis, the shape of the patient's face, the upper arch form, personal choice of the patient, the sex and age of the patient. It was recognized that there is an association between the shape of the maxillary central incisors and the shape of the patient's facial contour. Studies show that this method is more reliable in cases where there is no prior registration obtained from patient. Methods to decide the color of anterior teeth include tone of the patient's skin, eye color and hair, previous records such as photographs, pre-existing prostheses and the patient's personal preferences. Most of the literatures suggest that the tone of the patient's skin is the most consistent method in case of nonexistence of prefetch records.<sup>4</sup> In short there is some clarity regarding the selection approaches the size of the teeth and of form, but there are considerable variations between clinicians in their choice of methods for determining the size and shape of the teeth.

Posterior denture teeth with different occlusal shapes are used in routine dental practice, such as anatomic, semi-anatomic and non-anatomic. Each occlusal form has its own indications, However, there is no substantial evidence that any specific occlusal scheme significantly contribute to the comfort or effectiveness of prostheses.<sup>4</sup>

## METHODOLOGY

A simple questionnaire including 5 questions with multiple choice options was designed, piloted and then distributed to 45 dentists in a tertiary care hospital of Rawalpindi, Islamabad (Attached as Annexure–A). The questions in performa were related to the methods used in choosing artificial teeth for complete denture patients. Every participant was asked to encircle the methods that they preferred in their practice. The option of other methods not mentioned in the given list was also available for each question. Data was analyzed using SPSS software (Version # 17).

## RESULTS

Forty-five dentists participated in the study including 4 consultants, 21 house officers, and 20 prosthodontic residents. The preferences of these clinicians in terms of selection of mold, shade, size, material and posterior tooth form are summarized in tabulated form. For the selection of mold of artificial teeth in a complete denture patient, majority of the house officers (47%) and residents (40%) preferred patient face form, but it was noticed that all the consultant showed different preference, such as pre-extraction records, pre-existing dentures, patient's personal preference and other methods (wax rims, jaw relation).

TABLE 1: MOLD SELECTION FOR ANTERIOR TEETH

	House officer	Resi-dents	Consul-tants	Total
Pre-extraction records	5	4	1	10
Pre-existing denture	1	2	1	4
Patients face	10	8	0	18 (40%)
Edentulous	3	1	0	4
Gender	2	3	0	5
Patients preference	0	2	1	3
Others	0	0	1	1
Total	21	20	4	45 (100.0%)

TABLE 2: SHADE SELECTION

	House officer	Resi-dents	Consul-tants	Total
Pre-extraction records	2	3	2	7
Pre-existing denture	0	2	0	2
Complexion	10	11	1	22 (48.9%)
Personal preference	8	4	1	13
Other	1	0	0	1
Total	21	20	4	45 (100%)

TABLE 3: MATERIAL SELECTION

	House officer	Resi-dents	Consul-tants	Total
Porcelain	0	1	0	1
Acrylic	21	19	4	44 (97.8%)
Total	21	20	4	45(100.0%)

TABLE 4: SIZE SELECTION

	House officer	Resi-dents	Consul-tants	Total
Pre-extraction records	3	1	1	5
Gender	2	1	0	3
Bizygomatic width	3	3	0	6
Corners of mouth	7	6	3	16 (35.5%)
Ala of nose	5	8	0	13
Personal preference	1	1	0	2
Total	21	20	4	45 (100.0%)

TABLE 5: POSTERIOR TEETH OCCLUSAL FORM SELECTION

	House officer	Residents	Consultants	Total
Non-anatomic	3	0	0	3
Semi-anatomic	9	6	4	19
Anatomic	9	14	0	23 (51%)
Total	21	20	4	45 (100.0%)

In selection of shade for artificial teeth, majority of house officers (47%) and residents (55%) preferred complexion. But half of the consultants preferred pre-extraction records, and other two consultants preferred complexion and personal preference. In selecting material for artificial teeth, 100% of consultants and house officers preferred acrylic and a clear majority of residents (95%) preferred acrylic and only 1 out of 20 residents preferred porcelain.

In selecting size for artificial teeth, majority of consultants (75%) and house officers (33.33%) preferred corners of mouth, whereas majority of residents (40%) preferred ala of nose. For selecting occlusal form for posterior teeth, majority of house officers (85.7%) preferred semi-anatomic and anatomic teeth, but all consultants preferred semi-anatomic teeth and majority of residents (70%) preferred anatomic.

## DISCUSSION

The study was conducted on 45 dentists at tertiary care institutes in the twin cities of Rawalpindi and Islamabad. The results of the present study showed that although guidelines for selection of teeth provide a number of variables each of which can be used individually or more preferably in combination with other variables for final teeth selection for denture fabrication, yet the clinicians mostly have very clear preferences for using a specific approach for mold, shape, size, material and occlusal form selection. This study indicates that in the majority of cases patient's facial form was used as a guide for selection of the shape of anterior prosthetic teeth. This is in concurrence with numerous earlier studies on the same topic.<sup>4,8,11,13-16</sup>

Although there is no single reliable method for the selection of anterior teeth form<sup>11</sup>, it was found that the shape of the face of the patient is using the most convenient and consistent method if no record exists before extraction.<sup>4,11,14-16</sup>

Our study showed that the most common guide to select the color of artificial anterior teeth was the tone of the patient's skin, which is also consistent with findings

from previous studies.<sup>4,5-7,14</sup> This may be contributed to the fact that it is the easiest method to be used in our population where most of the female patients have their heads covered may not like to expose their hair to male clinicians and where a predominant majority of elderly male patients may have lost their natural hair.

The majority of participants chose an acrylic resin material for artificial teeth in our study. This agrees with previous study results.<sup>4</sup> This is in dissimilarity with other previous studies where the porcelain teeth were number one choice for the teeth in artificial prosthesis.<sup>8,17</sup> This new inclination might be reasonable that the use of porcelain teeth in denture decreased remarkably in recent years because of their susceptibility to chipping or breakage and complications related to their mechanical attachment for denture bases. New developments in artificial teeth material of hard acrylic resin and the latest composite resin, significantly reduced the use of porcelain teeth during the past decade.<sup>10,18</sup>

To select the size of the teeth, the most frequently used method was corners of the mouth at rest for recording inter-canine width. This is in contrast to those studies in which Ala of nose for recording inter-canine width is one of the most frequently used technique in the selection of dimensions for teeth.<sup>1,4,8,18,19</sup>

This study showed that the most often used form of posterior teeth was the anatomic teeth. This result is in concurrence with other preceding studies.<sup>4,8-10</sup> However, there is no definite data from earlier studies that any particular tooth shape is more proficient than the other.<sup>20-21</sup> This was probably one of the main reasons that all the senior Prosthodontists unanimously preferred semi anatomic teeth over anatomic teeth in this study. It appears that, the preference depends more on the clinical condition or the dentist preference.<sup>12</sup>

Our study was limited by the fact that its sample size was small, owing to very few consultant Prosthodontists and Prosthodontic residents in the twin cities of Rawalpindi and Islamabad. Also we asked the clinicians about their single most preferred method regarding selection of size, shape, mold, anatomic form and material of teeth whereas under normal clinical situations usually a combination of methods are employed to arrive at the correct selection of these domains.

This survey shows that the methods of choosing artificial teeth for dental prostheses differ from one dentist to another and there is no single best method for the selection of shape, color, dimension and kind of artificial teeth for complete dentures as it depends on a myriad of clinical factors and personal preferences.

## REFERENCES

- 1 Ahmad N, Ahmed M, Jafri Z Esthetics Considerations In The Selection Of Teeth For Complete Denture Patients: A Review. [Internet]. 2016 [cited 17 January 2016].
- 2 Vasantha Kumar M, Ahila S, Suganya Devi S. The Science of Anterior Teeth Selection for a Completely Edentulous Patient: A Literature Review. *The Journal of Indian Prosthodontic Society*. 2011; 11(1): 7-13.
- 3 Ahila S, Vaishnavi P, Muthu Kumar B. Comparative Evaluation of Maxillary and Mandibular Anterior Teeth Width with the Length of Index and Little Finger. *The Journal of Indian Prosthodontic Society*. 2012; 14(3): 215-18.
- 4 Al Ali K. Current Concepts of Selecting Teeth For Complete Dentures Among Dentists In Riyadh, Saudi Arabia. *Pakistan Oral & Dental Journal* Vol 29, No. 1, (June 2009).
- 5 Hassaballa MA. *Clinical complete denture prosthodontics*. King Saud University, Academic Publishing and Press, Riyadh, Saudi Arabia. 2004, pp: 235-56.
- 6 Johnson DL, Stratton RJ. *Fundamentals of removable prosthodontics*. Quintessence Publishing Co., Inc. Chicago, Ill. 1980, pp: 387-408.
- 7 Watt DM, MacGregor AR. *Designing complete dentures*. 2nd ed, Bristol, Wright. 1986, pp 119-41.
- 8 Levin B, Sauer JL. Results of a survey of complete denture procedures taught in American and Canadian dental schools. *J Prosthet Dent* 1969; 22: 171-77.
- 9 Arbree NS, Fleck S, Askinas SW. The results of a brief survey of complete denture prosthodontic techniques in predoctoral programs in North American dental schools. *J Prosthodont* 1996; 5: 219-25.
- 10 Jagers JH, Javid NS, Colaizzi FA. Complete denture curriculum survey of dental schools in the United States. *J Prosthet Dent* 1985; 53: 736-39.
- 11 Sellen PN, Jagger DC, Harrison A. Methods used to select artificial anterior teeth for the edentulous patient: A historical overview. *Int J Prosthodont* 1999; 12: 51-58.
- 12 Hoffman W, Bomberg T, Hatch R, Benson B. Complete denture: A review. *Quintessence Int* 1985; 5: 349-55.
- 13 Young HA. Selecting the anterior tooth mould. *J Prosthet Dent* 1954; 4: 148-60.
- 14 Halperin AR, Graser GN, Rogoff GS, Plekavich EJ. *Mastering the art of complete dentures*. Chicago, IL, Quintessence Publishing, 1988, pp 107-31.
- 15 Wehner PJ, Hickey JC, Boucher CO. Selection of artificial teeth. *J Prosthet Dent* 1967; 18: 222-232.
- 16 Esposito SJ. Esthetics for denture patients. *J Prosthet Dent* 1980; 44: 608-15.
- 17 Harrison A. Prosthodontic techniques and the timing of complete denture procedures: A survey. *J Prosthet Dent* 1977; 37: 274-79.
- 18 Zarb GA, Bolender CL, Carlsson GE. *Boucher's prosthodontics treatment for edentulous patients*. 11th ed. St. Louis, MO, Mosby, 1997, pp 231-61.
- 19 Engelmeier RL. Complete denture esthetics. *Dent Clin North Am* 1996; 40: 71-84.
- 20 Kapur KK, Soman S. Masticatory performance and efficiency in denture wearers. *J Prosthet Dent* 1964; 14: 687-94.
- 21 Brewer AA, Reibel PR, Nassif NJ. Comparison of zero degree teeth and anatomic teeth on complete dentures. *J Prosthet Dent* 1967; 17: 28-35.

## CONTRIBUTION BY AUTHORS

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| <b>1 Salma Muhammdi:</b>           | Research idea + manuscript writing.   |
| <b>2 Syed Hammad Hassan Rizvi:</b> | Data collection + manuscript writing. |
| <b>3 Azad Ali Azad:</b>            | Editing + review.                     |
| <b>4 Mubashir Sharif:</b>          | Results compilation + proof reading.  |