

der Zahnheilkunde., Band 7., 2. Auflage, Urban&Schwarzenberg München-Wien-Baltimore, 1987, 125-126

7. Jacobson, T., A. Krol: A contemporary review of the factors involved in complete denture., J. Prosth.Dent., 1978, 40, 131

8. Kelsey, C., D. Fredrick, J. Coplowitz: A method of measuring pressures

against tissues supporting functioning complete dentures. J. Prosth. Dent., 1976, 35: 376

9. Kühl, W.: Geometrie der scharniergelenkbezüglichen Modellorientierung. Deutsche Zahnärztliche Zeitschrift., 1967, 22, 873

10. Winter, C., J. Woelfel, T. Igarashi: Five-year changes in the edentulous man-

dible as determined on oblique cephalometric radiographs, J. Dent. Res. 1974, 53, 1455

11. Woelfel, J., C. Winter, T. Igarashi: Five-year cephalometric study of mandibular ridge resorption with different posterior occlusal forms, Part I J. Prosth. Dent., 1976, 36: 602

#### Adress for correspondence:

Dr. Mariana Dimova, PhD,  
1606 Sofia, Ami-Bue Str. 10/A app.11  
+359/888 872 509; +359/2 9524119  
e-mail: marianadimova@abv.bg

*Journal of IMAB - Annual Proceeding (Scientific Papers) 2005, book 2*

## CRITICAL OBSERVATION OF THE ANATOMIC CAST MODELS BY PATIENTS WITH FULL DENTURES

Mariana Dimova, Hrizdana Hadjieva  
Department of Prosthodontics, Faculty of Stomatology,  
Medical University-Sofia, Bulgaria

### ABSTRACT

**Introduction.** The maxillary and the mandibular anatomic casts of full dentures impressions should include all the anatomic surfaces of the anatomic impression as an appropriate individual tray to be performed.

The **purpose** of the authors is to present the most often mistakes by anatomic casts of full dentures' first impressions made in the Prosthodontics' exercises in the clinics of Prosthodontics, Faculty of Stomatology-Sofia by the students.

**Materials and methods.** On critical observation were subjected 48 anatomic casts (26 upper and 22 lower casts) of 28 patients (16 women and 12 men) with a forthcoming full dentures' prosthodontic treatment. The results show that 37, 5% of the anatomic casts didn't meet the requirements of an appropriate stone cast.

**Discussion.** The observed shortcomings and defects by the false casts draw our attention on the necessity of more detailed and well grounded explanation of oral anatomy in connection with the future role of the anatomic stone casts for the retention and stability and construction of the full dentures.

**Key words:** critical observation, stone casts, edentulous jaws

### INTRODUCTION

The detailed observation of the edentulous jaws has a very important meaning for the final result of the treatment (1, 2, 4, 5). Not all the anatomic structures but are clearly seen although how carefully the observation is made. The investigation of the anatomic cast models according Boyanov (1), allows the gathering even of an additional and useful for the prosthetic treatment data.

The inaccurate duplication of the prosthesis base' anatomy in the casts could be explained by the following reasons: inadequate custom tray, deficiency of the impression material, errors in pouring the cast etc. The absence of certain elements and anatomic landmarks on the cast lead to mistakes in the individual tray. Thus further inexactness in taking the functional impression is possible.

The **purpose** of the authors is to present the most often mistakes by anatomic casts of full dentures' first impressions made in the Prosthodontics' exercises in the clinics of Prosthodontics, Faculty of Stomatology-Sofia by the students.

### MATERIALS AND METHODS:

On critical observation were subjected 48 anatomic casts (26 upper and 22 lower casts) of 28 patients (16 wom-

en and 12 men) with a forthcoming full dentures prosthodontic treatment. The patients' age varied from 57 to 78 years. All the patients were treated by students from 4<sup>th</sup> and 5<sup>th</sup> grade for the period from 30.09.04 to 30.04.2005 year.

After the observation of the patients and choosing of the custom tray/trays the first impressions were taken with "Ypeen", /Spofa Dental/. The choice of appropriate edentulous impression metal trays and the impressions were controlled by the authors. The impressions with shortage of the impression material, or with missing anatomic parts and pores were eliminated and new impressions were taken. Only the impressions with full anatomic information were poured in dental stone and set for 45 min. The casts after that were put for 5 min. in water, the tray material removed and the excesses trimmed.

On the next clinical appointment the casts were investigated and were compared with the anatomical structures in the patients' mouth if needed. Only the good casts served as the casts for the making of individual impression trays for the subsequent full denture treatment.

The maxillary and the mandibular casts should include all the anatomic surfaces of the anatomic impression, to include 3-5 mm land area around the entire periphery of the cast, have a base 10-12 mm thick and parallel to the residual ridges and contain no bubbles and flaws. The cast should preserve the details of the impression.

On critical observation were subjected 48 anatomic casts (26 upper and 22 lower casts) of 28 patients (16 women and 12 men) with a forthcoming full dentures prosthodontic treatment. The casts with observed shortcomings which could be define as pouring mistakes and errors by cutting and trimming the casts were subjected to critical observation.(Fig. 1. and 2.)



**Fig. 1.** Lower jaw cast with bubbles on the alveolar ridge and fractured trigoni retromolare and the adjacent buccal flange.



**Fig. 2.** Upper jaw cast with partially destroyed peripheral buccal fold and the fold in the regions of tubercle maxillae and cut plicae pterygomaxillares

## RESULTS

The results from the critical observation of the casts showed that from all 48 casts only 30 (62, 5%) represented truly the anatomic characteristics of the prosthesis' base tissues and were used later for planning and fabricating of the individual tray. By the rest 18 casts (37, 5%), (from them 8 casts from upper jaws (44, 45%) and 10 models of lower jaws (55, 55%) different shortcomings were recognized. The distribution of the defects by jaws and number are shown on tabl. 1.

The most often mistakes we established by observation of the upper jaw casts were: bubbles-37,5%, partially or almost destroyed mucosal fold most often at the tubercle maxillae-31,25%, missing parts of A-line and cut details from plicae pterygomaxillares 31,25%. By the critical observation of the lower jaw casts we established the following errors: bubbles by 33,33%, partially or almost entirely cut mucolabial and more often mucobuccal fold 35,92%, missing or fractured trigoni retromolare 25,92%, destroyed mylohyoid plicae and cut parts under linea mylohyoidea 14, 81%. Tabl. 2

**Tabl. 1.** Distribution of the number of the defects by upper and lower casts

	Upper jaw			Lower jaw	
Number of defects	Number of casts	Total number of defects	Number of defects	Number of casts	Total number of defects
1	3	3	1	1	1
2	2	4	2	2	4
3	3	9	3	6	18
			4	1	4
Total	8	16	Total	10	27

**Tabl. 2.** Distribution of the defects by kind and localization

Upper jaw casts				Lower jaw casts			
1	Bubbles	6	37,50%	1	Bubbles	9	33,33%
2	Defects at mucolabial and mucobuccal fold	5	31,25%	2	Defects at vestibular and buccal fold	7	25,92%
3	Defects at posterior palatal line	5	31,25%	3	Defects at retromolar pad	7	25,92%
4				4	Defects at alveolingual fold and linea mylohioidea	4	14,83%
	Total numbers of defects	16	100%		Total number of defects	27	100%

## DISCUSSION

The critical investigation of the first anatomic casts shows that 62, 5% of them are performed without substantial from clinical point of view mistakes. The most common errors by the rest false casts are: bubbles in the tissue surface- 37, 5% for upper jaw casts, and 33, 33% for the lower jaw casts, followed by the missing parts of the peripheral fold tissues- 31,25% for the upper and- 25,92% for the lower stone casts.

The observed shortcomings and defects by the false casts draw our attention on the necessity of more detailed and well grounded explanation of oral anatomy in connection with the future role of the first cast for the retention

and stability of the full dentures. The students are not enough motivated to preserve very important details on the casts and are not quite careful in pouring the impressions and to mix the stone in the desirable consistence by correct water/powder ratio.

Revealing of the mistakes in the first stage of the full denture prosthetic treatment allows their elimination and save a lot of time consuming procedures and further deepening of the errors. The students' knowledge of the zones of support and retention of the full dentures will motivate them to seek and find those important anatomical characteristics as in the mouth as well on the casts.

## REFERENCES:

1. Boyanov, B., V. Kurlyandski. Prosthetic treatment of edentulous jaws. *Medicina i Fiskultura*, Sofia, 1964,p.65
2. Popov, N. Clinics of Prosthetic dentistry. *Medicina i Fiskultura*, Sofia, 1996
3. Hupfauf, L., W. Gernet, R. Horn, et al: Totalprothesen, Praxis der Zahnheilkunde 7, Urban&Schwarzenberg, München-Wien-Baltimore, 1987, 77- 97
4. Geering, H., M. Kundert: Total- und Hybridprothetik. *Farbatlant der Zahnmedizin*, Band 2, Georg Thieme Verlag Stuttgart-New York, 1986, 7-13
5. Zarb, G.A., C. L. Bolender, J. C. Hickey, G. E. Carlsson: *Boucher,s Prosthodontic Treatment for Edentulous Patients*, ed. 10, St. Louis, CV Mosby, 1999

## Adress for correspondence:

Dr. Mariana Dimova, PhD,  
1606 Sofia, Ami-Bue-Str. 10/A app.11  
+359/888 872 509; +359/2 9524119  
e-mail: marianadimova@abv.bg