

A rare case of individually designed total removable dentures with patients' inclusion in the decision for aesthetics: A case report

Sonja Petkova ^{1,*}, Budima Pejkovska Shahpaska ^{1,2}, Meri Lazarova ¹ and Blagoja Dastevski ^{1,3}

¹ Public Health Institution University Dental Clinical Centre "St. Panteleimon" – Skopje, North Macedonia.

² Faculty of Medical Sciences, Goce Delcev University, Stip, North Macedonia.

³ University "St. Cyril and Methodius", Faculty of Dentistry, Skopje, North Macedonia.

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Abstract

Introduction: In our everyday clinical dental practice at the Clinic for Removable Dentistry at the University Dental Clinical Centre "St. Panteleimon" – Skopje, R.N.Macedonia total removable dentures are manufactured with respect to the prosthetic principles.

Purpose: The purpose of this article is to represent a rare case of individually designed total removable dentures with patients' inclusion in the decision for aesthetics.

Material and methods: A 70 year old patient came at the Clinic for Removable Dentistry at the University Dental Clinical Centre "St. Panteleimon" – Skopje, R.N.Macedonia, with a request to change his old worn-out dentures. At the clinical objective measurements his vertical height has been decreased, and he had problem with mastication. Increase of the vertical dimension was recreated, with specific request for the color, shape and length of the new set of acrylic teeth of the patient.

Results and Discussion: The internet is approachable to our patients so they can have an option to choose a variety of teeth that suit them, however with respect to the dental prosthetic principles. Finlay Sutton with his technician Rowan are in favor of individually designed dentures using dental photographs of patients in their youth. Their work is in correlation with our article where we use two different sets of acrylic teeth.

Conclusion: The participation of the patient in choosing the proper shape, length and color (colors) of the acrylic teeth can be helpful in recreating the lost intermaxillary relations in the patients' mouth.

Keywords: Individually designed total removable denture; Color; Shape; Length of teeth

1. Introduction

To rehabilitate an edentulous patient has been a challenge for many years. Losing all teeth called edentulism has aesthetic, functional and psychosocial consequences. These consequences can be corrected with the placement of removable total dentures.⁽¹⁾

* Corresponding author: Sonja Petkova

Conventional approach of manufacturing total dentures with respect to the old known prosthetic principles means reconstructing and rehabilitating the patients' anatomy, physiognomy, physiology and enabling them to have a dignified life.

Lawton et al. (2008) state that there are marked ethnic disparities in edentulism and tooth loss that exist in New Zealand. The authors state that effective targeted programs are needed to reduce the public on the health impact of poor oral health among Maori.⁽²⁾

Literature data basis state that there has been a decline in both the prevalence and incidence of tooth loss within the last decades, because people tend to live longer and learn how to preserve their natural dentition for longer. However there exist different group of patients with more than 10% of adults aged 50–64 that are completely edentulous. The reasons for complete loss of teeth besides the socioeconomic status can include dental caries, periodontal disease, trauma, congenital disorders (e.g. dentinogenesis imperfecta, molar incisor hypomineralisation) or parafunction.⁽³⁾

Besides the complete digital dental workflow for manufacturing, designing and creating total dentures they are still widely available and proven classic techniques.

At the Clinic for Removable Dentistry the University Dental Clinical Centre "St. Panteleimon" – Skopje, R.N.Macedonia, still therapists work in mutual cooperation with dental technicians at five subsequent phases. The first phase is taking preliminary dental impressions, the second is taking the definitive impression, then the third phase involves evaluating the intermaxillary relations and choosing the color and shape of the teeth. The fourth phase includes try in wax dentures and the fifth phase includes the definitive restauration. This has been a protocol since the beginning of the forming of the clinic and functions as a well proven methods in patient with total edentulism. In the population in North Macedonia there are still many patients wearers of total dentures and patients that in the future will be in need of total dentures.

Impression taking and facial analysis, and the subsequent use of recording bases and wax rims to determine vertical dimensions and centric relations, has continuously evolved, but even in modern dentistry, the complete denture treatment process remains completely unchanged from the past. The process of traditional manufacturing of total dentures requires the skill of an experienced dentist, since achieving an ideal tooth arrangement precisely aesthetic and functional, is hard work. Digital workflow is present however classic manufacturing remains a gold standard.⁽⁴⁻¹⁰⁾

Even though there can be a variety of total dentures manufactured and beautified with skillful technicians using resins with the 3D design, still in traditional manufacturing dental acrylics remain widely applicated.⁽¹¹⁾

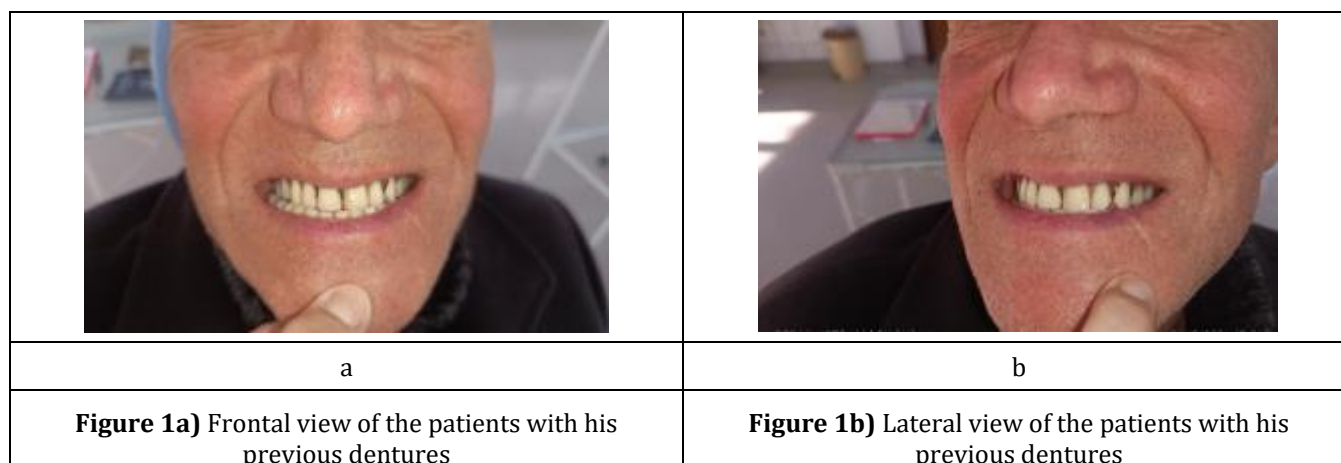
Purpose

The purpose of this article is to represent a rare case of individually designed total removable dentures with patients' inclusion in the decision for aesthetics.

2. Material and methods

A 70-year-old patient came at the Clinic for Removable Dentistry at the University Dental Clinical Centre "St. Panteleimon" – Skopje, R.N.Macedonia, with a request to change his old worn-out dentures. At the clinical objective measures his vertical height has been decreased and he had problem with mastication and chewing of the food which gave him stomach problems.

At the time he had made his dentures he had requested the dentist to reduce and reshape his lateral left incisor (figure 1a) and b)).



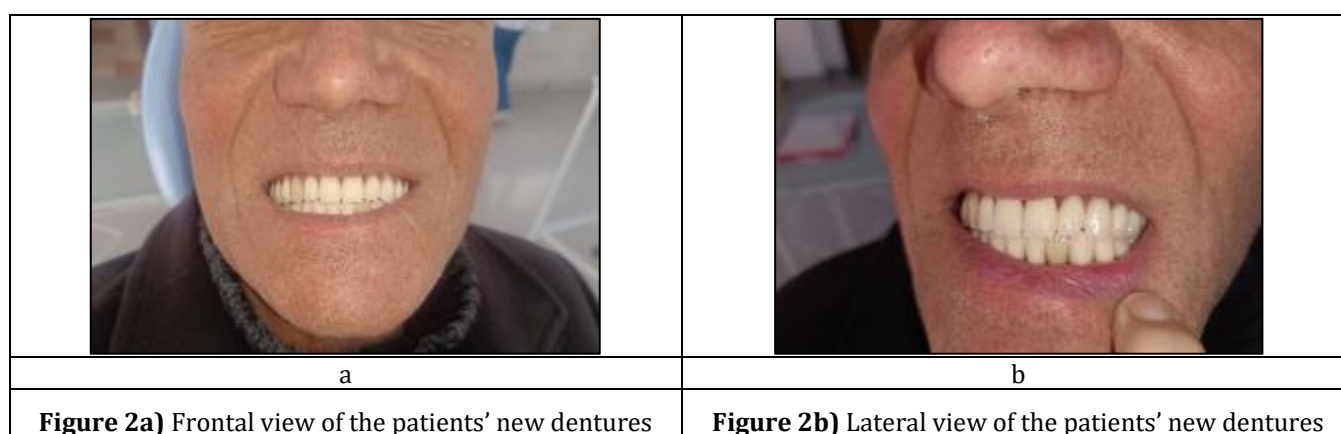
Measurements from the most prominent part of the nose to the most prominent part of the chin (protuberantia mentalis), with digital caliper were performed.

After taking preliminary dental impressions, individual trays were manufactured. With them definitive impressions were made from hard dental plaster, upon which wax dentures were manufactured, for registration the intermaxillary relations.

The registration of intermaxillary relations involved also measurements with digital caliper.

The phase when the teeth were to be tried in the patient's mouth the patient took direct participation in the choice of color, shape and length of the teeth, because he wanted them to resemble his natural teeth when he was young. So the dental team consisting of dental prosthodontist, dental technician and the patient himself chose Ivoclar Vivadent dental acrylic teeth shade B2 by the matching color determining key (from Ivoclar Vivadent) for most of the teeth, however for the upper right canine and the left lower incisor he wanted a slightly darker shade C3 as he had in his youth. He chose the diversity of teeth so they will resemble the younger version of himself (figure 2a) and b)).

After the acceptance of the patients wish the wax from the dentures was replaced with hard acrylic material in the conventional way.



After the dental technician had finished and polished the dentures the patient had another request for his left upper lateral incisor to be distally cut – resembling a fracture he had (for him it made a signature look and looked authentic).

For the dental prosthodontist to accept these unnatural changes means that the patient must sign up a specific agreement formular that states that the patient accepts the modifications of the denture to his own request and belief even though this is not a rule by the book.

The patient was followed for a period of six months in which he came three times for corrections and was satisfied more than anyone with his new set of total dentures.

He was overwhelmed with the aesthetic appearance and also in functional aspect he stated that because of the increased vertical dimension he could chew the food properly and did not have stomach problems.

3. Results and discussion

Zou and Zhan explain that to rehabilitate edentulous patients with complete dentures that will suit each patient individually has always been a great challenge to dentists because to achieve satisfaction with complete dentures several different denture-related, patient-related, and oral-related factors must be taken in consideration. Aesthetics, phonetics, mastication, functional aspects experiences with previous dentures, and patient expectation are some of them.⁽¹²⁾

In this article the patients' satisfaction was put on the first place in coordination with the dental prosthodontist and the dental technician.

The patient in this study was previously treated with classic total dentures from dental acrylics. Overtime because of the long period of time of usage (15 years) they became worn out, the occlusal vertical dimension was distorted and the patient had a position of the mandible in habitually position of protrusion. Articles by Zani et al. confirms that patients who had previous dentures could adapt more easily and were generally more satisfied with their newly inserted dentures especially with regard to their chewing ability and comfort with their mandibular dentures, which is in correlation with our study.⁽¹³⁾

Alzeghaibi et al. in their cross-sectional study, distributed an online based questionnaire, in which 475 participants were included. Their results have shown that most participants involved in the shade selection procedure (81%) were satisfied with the shade of their dental prostheses (83.7%). Satisfaction rate was higher in patients who participated in shade selection (87.8%). Their work proved that one in every three patients wanted a lighter shade than that they currently have. All results were statistically significant.

These authors concluded that patients' participation in their prostheses' shade selection increased their satisfaction with them, which is in correspondence with this article. Also during the entire process it is of great significance that patients receive professional advice during shade selection for them to make an informed decision regarding the shade of their prostheses.⁽¹⁴⁾

Since in this article the patient had unspecific wishes for which he signed specific agreement formular for the protection of the dental team, it is of great importance that patients in the future realize that that is their choice. In the Clinic more often than not we have situations when one color shade is agreed upon, but at the final dentures patients change their mind.

In a study by Samorodnitzky-Naveh patients' anterior teeth shade evaluation was conducted first by the patient (n = 193) and then by the clinician using the Vita shade guide. The results obtained showed that in 18.7% of participants, self-assessment of teeth shade matched in hue and chroma to the clinician's evaluation. A positive correlation was found between participants' self-assessment of their shade and the clinician's assessment ($P = .014$; Pearson product moment correlation). Participants in this study assessed their shade darker than the clinician ($P < .001$; chi-square test), which we experience every day in our dental prosthetic practice. Also the authors say that only 3.6% were highly satisfied with the shade of their teeth, and 83.4% were interested in a future bleaching procedure, which is something different from our patient for this case study. A patient's preference toward a lighter shade should be addressed during treatment planning to match the patient's expectations for esthetics and increase patient satisfaction of treatment outcome. Patients may prefer white and shiny rather than a natural appearance.⁽¹⁵⁾

The patient in this case report requested two teeth with two shades darker and a cut in his second upper left incisor to his complete satisfaction which can not be said to be acceptable for the dental team.

Even though digital systems in dentistry rapidly take place, still there are many patients on bisphosphonates and have many other medical conditions and the only option for them is removable dentures. Finlay Sutton with his technician Rowan show meticulously the entire process of manufacturing dentures using photographs from the patients from their youth, which also in correlation with this article. They show their work through courses by teaching the future generations of the significance of properly designed dentures.⁽¹⁶⁾

4. Conclusion

The results obtained from this study indicate that the experience and wishes of the patients and inclusion in the manufacture of total removable dentures influence as decisive factors with the manufacture of his new pair of removable total dentures more than the experience of the dentist himself. The case shown in this article is rare since it can happen once in our career and we chose to represent him. The process of producing individually designed total removable dentures with patients' inclusion in the decision for aesthetics is present even more with digital dentistry. In conventional way the patients' photographs of his youth and acceptance of his natural image help in recreating the lost dental and bone structures in the new total removable dentures. In this case the colors of the teeth was even more interesting which makes this case unique. The smile that the patient carries with the help of skilled dental prosthodontist and dental technician make these individually designed dentures worthwhile to be manufactured.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

- [1] Pisani M. X., Malheiros-Segundo A. L., Balbino K. L., de Souza R. F., Paranhos H. F., da Silva C. H. Oral health related quality of life of edentulous patients after denture relining with a silicone-based soft liner. *Gerodontology*.2012;29(2):e474–80. doi: 10.1111/j.1741-2358.2011.00503.x.
- [2] Lawton B, Rose S, Kieser J, Broadbent J, Sussex P, Thomson M, Dowell A. Disparities in edentulism and tooth loss between Māori and non-Māori New Zealand women. *Australian and New Zealand Journal of Public Health*.2008;32(3):254-260 ISSN 1326-0200, <https://doi.org/10.1111/j.1753-6405.2008.00225.x>.
- [3] "Tooth Loss in Adults (Age 20 to 64)". National Institute of Dental and Craniofacial Research. February 2018. Retrieved March 2, 2018
- [4] J.B. Woelfel. Processing complete dentures. *Dent. Clin.*, 21 (2) (1977), pp. 329-338
- [5] F. Fayz, A. Eslami. Determination of occlusal vertical dimension: a literature review. *J. Prosthet. Dent*, 59 (3) (1988), pp. 321-323
- [6] A. Villias, H. Karkazis, S. Yannikakis, N. Polychronakis, P. Zoidis. Current status of digital complete dentures technology. *Prosthesis*, 3 (3) (2021), pp. 229-244
- [7] A.S. Bidra, T.D. Taylor, J.R. Agar. Computer-aided technology for fabricating complete dentures: systematic review of historical background, current status, and future perspectives. *J. Prosthet. Dent*, 109 (6) (2013), pp. 361-366
- [8] A. Keshvad, R.B. Winstanley, T. Hooshmand. Intercondylar width as a guide to setting up complete denture teeth. *J. Oral Rehabil.*, 27 (3) (2000), pp. 217-226
- [9] J.B. Woelfel. Processing complete dentures. *Dent. Clin.*, 21 (2) (1977), pp. 329-338
- [10] J.P. Duncan, T.D. Taylor. Simplified complete dentures. *Dent. Clin.*, 48 (3) (2004), pp. 625-640
- [11] Mosaddad A S, Khorasani E, Schimmel M, Treviño S, P Stefano, Ç Gülce, Molinero-Mourelle P. Do resin-modified 3D-printed complete dentures show improved mechanical, physical, surface, and biological properties? A systematic review and meta-analysis. *Journal of Dentistry*.2025;161:105983, ISSN 0300-5712, <https://doi.org/10.1016/j.jdent.2025.105983>
- [12] Zou Y., Zhan D. Evaluation of psychological guidance impact on complete denture wearer's satisfaction. *Journal of Oral Rehabilitation* . 2014;41(10):744–753. doi: 10.1111/joor.12202
- [13] Zani S. R., Rivaldo E. G., Frasca L. C. F., Caye L. F. Oral health impact profile and prosthetic condition in edentulous patients rehabilitated with implant-supported overdentures and fixed prostheses. *Journal of Oral Science* . 2009;51(4):535–543. doi: 10.2334/josnurd.51.535

- [14] Alzeghaibi F, Jammah A, Alghanim F, Albawardi K, Alkadi L. The relationship between patient's participation in shade selection and their satisfaction with their dental prostheses. Clin Exp Dent Res. 2022 Feb;8(1):270-274. doi: 10.1002/cre2.508. Epub 2021 Oct 28. PMID: 34708561; PMCID: PMC8874071
- [15] Samorodnitzky-Naveh GR, Grossman Y, Bachner YG, Levin L. Patients' self-perception of tooth shade in relation to professionally objective evaluation. Quintessence Int. 2010 May;41(5):e80-3. PMID: 20376367<https://www.finlaysutton.co.uk/>