

## Prosthetic rehabilitation of complete edentulous patients with morphological changes induced by age and old ill fitted dentures

OANA CELLA ANDREI<sup>1)</sup>, RUXANDRA MĂRGĂRIT<sup>2)</sup>, LIVIA-ALICE TĂNĂȘESCU<sup>1)</sup>, LUMINIȚA DĂGUCI<sup>3)</sup>, CONSTANTIN DĂGUCI<sup>4)</sup>

<sup>1)</sup>Department of Removable Prosthodontics, Faculty of Dentistry, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

<sup>2)</sup>Department of Restorative Odontotherapy, Faculty of Dentistry, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

<sup>3)</sup>Department of Prosthodontics, Faculty of Dentistry, University of Medicine and Pharmacy of Craiova, Romania

<sup>4)</sup>Department of Prevention of Oro-dental Diseases, Faculty of Dentistry, University of Medicine and Pharmacy of Craiova, Romania

### Abstract

Extremely old, complete edentulous patients are very difficult to treat both because of their anatomical and psychological condition. Treatment challenges are increasing when this situation is associated with low socio-economic status, poor general health and unrealistic expectations. This article presents a prosthetic rehabilitation of a very old patient, presenting a serious bone atrophy associated with a maxillary flabby ridge, whose dentures accelerated the bone resorption because of their poor fitting, lack of retention and wrong occlusal contacts. Despite his old age and scarce social life, restoring esthetics in the trial phase had a major psychological impact for the patient, making him more optimistic about the result and helping him to accept and functionally integrate the new complete dentures.

**Keywords:** flabby ridge, mandibular atrophy, complete denture.

### Introduction

Total edentulism is a major health problem that seriously affects the quality of life [1, 2]. Despite the progress occurred in dental techniques and materials, there is a very high prevalence of edentulous patients in every country; these patients are suffering from problems of both appearance and function. In our country, because of a low socio-economic status, the majority of these patients are wearing their complete dentures a great number of years, without any attempt of reconditioning them by rebasing or relining, which creates premises for accelerate ridge resorption and progressive instability of the dentures. Reestablishing function, comfort and appearance of these very old patients is a challenge for any clinician, no matter how experienced. Often, these patients are very difficult to manage not only anatomically, but also psychologically and many dentists are avoiding them because they are a frequent source of frustration.

The quality of a complete denture treatment is generated by a good support, stability and retention. In order to obtain them, the final impression is very important in terms of properly recording the entire functional denture-bearing area. Some morphological factors can increase the difficulty of manufacturing a satisfying complete denture. A severe atrophy of the alveolar ridge, both in upper and in lower jaw, represents a great challenge. This atrophy, occurred after teeth extraction, is more rapid when the patient is wearing ill fitted dentures for a long period; the fact that the process of resorption is centrifugal in mandibular [3]

and centripetal in maxillary bone creates more problems in obtaining a proper occlusion. Caused by this massive resorption of the ridge, an excessive movable soft tissue – flabby ridge – may appear, its presence generating difficulties in obtaining an accurate, good quality impression and a well-fitting denture. In such cases, if it is possible, an implant supported complete denture can be a better alternative solution. Flabby ridge is usually present in the anterior upper jaw and it is a part of the combination syndrome [4].

### Case presentation

The 86-year-old male patient was experienced ongoing difficulties with his complete dentures, in service for 19 years. His complaints regarded function, comfort and esthetics. The poor fitting of these dentures and faults in their base extension had a significant impact on function; also, they failed to restore the appearance because of wrong horizontal and vertical jaw relationships, unaesthetic execution and lack of hygiene. He wanted a new pair of complete dentures, unfortunately expecting them to look and to function as his lost natural teeth, while his socio-economic status did not permit to access any implant-treatment solution. He complained about the accumulation of food under the dentures, their esthetic and also their lack of stability, and consequently his difficulties while eating and speaking.

The examination of the old dentures revealed wrong peripheral extension, incorrect posterior palatal seal, poor

bases adaptation, poor occlusion, wrong tooth position and insufficiently polished surfaces associated with poor hygiene. At clinical examination, we found severe maxillary and mandibular bone atrophy, with excessive bone loss in both the anterior and the posterior areas. In the anterior part of the upper jaw, we noticed the presence of the flabby tissue, which is making the upper denture even more unstable because of its displacing during function. The occlusal contacts were incorrect and insufficient to maintain the stability of the dentures (Figure 1).



**Figure 1 – The old ill fitted dentures, associated with flabby ridge and maxillary and mandibular atrophy.**

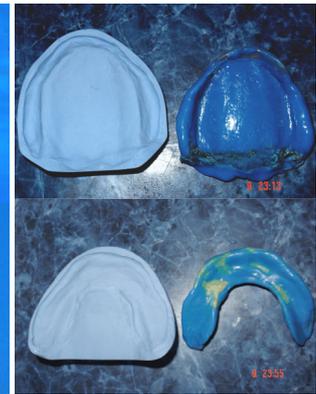
The main problem of this patient was the completely poor situation of the denture bearing and limiting areas. The severe atrophy of both jaws and the displaceable soft tissue in the upper front area were a challenging clinical scenario, especially because it was associating with his age, poor general health, psychological state and neuromuscular coordination. The patient wanted a completely non-surgical solution, despite the fact that he was informed about the potential benefits of implants and of the problems that flabby ridge creates by displacing the denture under masticatory load, causing its poor retention, pain and decubitus ulcers. In agreement with the patient's options, we decided to fabricate two classical new complete dentures. Both edentulous arches were in a state of severe atrophy, with very low resilience excepting the upper front area, which was displaceable, so all the impression materials had to be of a very low consistency in order to avoid any unbearable pressure.

The primary impressions were taken using an upper and a lower universal edentulous trays and alginate (Figure 2). On the primary upper cast, the flabby ridge area was marked and we applied a wax spacer. On the lower cast, we applied the spacer on the genial tubercles. The genial tubercles were prominent, making difficult to obtain the peripheral seal.

Considering the fact that the flabby ridge can not be compressed during impression, we used an elaborated impression technique that implied two successive customized trays and very low consistency materials, as zinc oxide eugenol paste and extra low viscosity polyvinyl siloxane in the first tray and a low-medium viscosity polyvinyl siloxane in the second modified tray. The first upper and lower customized trays were made from light curing composite material and the second were made from autopolymerizing acrylic resin that allowed us to better model the margins. Every impression was boxed for the same reason. For the peripheral seal and a proper compression of the distal palatal area, we used green stick compound (Figure 3).



**Figure 2 – Maxillary and mandibular first custom trays and impressions.**

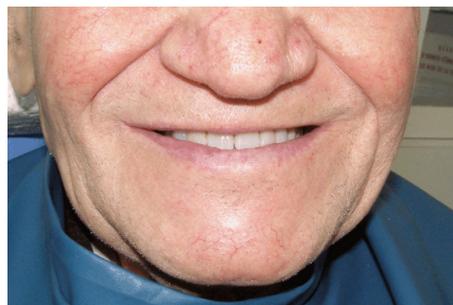


**Figure 3 – First casts, maxillary and mandibular second custom trays and final impressions.**

A special attention was also accorded to the reevaluation of the vertical dimension of occlusion (VDO) and the registration of the intermaxillary relations (centric relation) (Figure 4). After this phase, many old pictures of the patient, from the dentate period, were used in the office and laboratory, so the trial dentures already restored the appearance. From this moment on, seeing himself in the trial phase (Figure 5), the patient became more cooperative and optimistic about his new dentures that came in the next appointment (Figure 6).



**Figure 4 – Maxillary wax rim, the level of the occlusal plane and the final registration of the centric relation.**



**Figure 5 – Trial dentures restoring the appearance.**



**Figure 6 – Occlusal view of the new dentures.**

Pressure on the flabby tissue areas and genial tubercle was verified and occlusion was carefully adjusted for the new dentures during that clinical appointment. The fact that the patient liked his new optimized appearance, making him look younger (Figure 7), was a major subjective factor in his rapid adaptation.



Figure 7 – Frontal and profile view of the patient without dentures, with the old ones and with the new complete dentures.

## Discussion

The prevalence of flabby ridges found in literature was 24% for the upper jaw and 5% for the lower jaw [5, 6]. Flabby tissue can be generated by unplanned and uncontrolled dental extraction, as well as by wearing old ill fitted dentures [7, 8]. These lower resiliency tissues lead to the displacement of the dentures under masticatory load and generate the loss of the peripheral seal and then a poor retention of the denture, especially when they are associating with severe atrophy of the alveolar bone [9]. These tissues are not allowed to be compressed during impression, because they will tend to recoil and dislodge the over-lying denture. Different impression techniques were tried in order to obtain support on the flabby ridges without displacing them during function.

Magnusson *et al.* [10] use two impression materials applied into a custom tray: zinc oxide eugenol paste for normal tissues and a plaster material for flabby area. Crawford & Walmsley use two different materials and two custom-built trays, as well as Liddelow [11, 12]. Osborne [13] uses a custom-built tray with a “window” applied over the flabby tissues and a two steps impression, first more compressive than second, with zinc oxide eugenol, on normal tissues, combined in the second step of impression with a plaster material applied through the “window” on the flabby tissues. Watt & McGregor, recently revised by Watson [14], use another impression technique with a modified custom tray into which is applied an impression compound. The majority of these impression techniques tried over the time in order to overcome difficult flabby ridge cases are rather complex and time-consuming. Often, they require materials that are not usually used for impressions in dental practices.

Patients presenting severe resorption of the residual alveolar ridges are relatively common today. The severely resorbed mandibular ridge is more challenging for the clinician in his attempt to provide functionally successful dentures for these patients [15]. Recording of neutral zone is used by many dentists [16, 17]. If the patient's expectations are realistic, a correct restoration of functions and esthetics by a conventional complete denture is the

best treatment option for abnormal morphological situations [18].

Even in difficult cases with severe atrophy of the alveolar bone and flabby ridge, when the conventional complete denture is the treatment choice, the patient's cooperation [19] and realistic expectations can help in obtaining a result that assures both function and esthetics, the complete denture restoring the oral morphology. Previous prosthetic experience greatly influences the treatment expectations and subsequently satisfaction of the patient [20]. Patient's self-assessment of the dentures as a factor that increases the quality of life depends on obtaining a good appearance, retention and function [21–23].

## Conclusions

This difficult case of complete edentulous patient with severe bone atrophy at an old age was solved only by conventional treatment procedures, using successive custom trays, selective pressure impression techniques and VDO reevaluation. Despite the fact that we did not use implants and no surgical intervention such as removal of fibrous tissue was made, the new dentures satisfied the patient from the first moment, because they successfully restored his appearance, also replacing the excessive bone loss and providing lip support.

## Conflict of interests

The authors declare that they have no conflict of interests.

## References

- [1] Laurina L, Soboleva U. Construction faults associated with complete denture wearers' complaints, *Stomatologija*, 2006, 8(2):61–64.
- [2] Visscher CM, Lobbezoo F, Schuller AA. Dental status and oral health-related quality of life. A population-based study. *J Oral Rehabil*, 2014, 41(6):416–422.
- [3] Pietrokovsky J, Starinsky R, Arensburg B, Kaffe I. Morphologic characteristics of bony edentulous jaws. *J Prosthodont*, 2007, 16(2):141–147.
- [4] Kelly E. Changes caused by a mandibular removable partial denture opposing a maxillary complete denture. *J Prosthet Dent*, 1972, 27(2):140–150.

- [5] Allen PF, McCarthy S (eds). Complete dentures: from planning to problem solving. Quintessence Publishing Co. Ltd., London, UK, 2003.
- [6] Carlsson GE. Clinical morbidity and sequelae of treatment with complete dentures. *J Prosthet Dent*, 1998, 79(1):17–23.
- [7] Xie Q, Närhi TO, Nevalainen JM, Wolf J, Ainamo A. Oral status and prosthetic factors related to residual ridge resorption in elderly subjects. *Acta Odontol Scand*, 1997, 55(5):306–313.
- [8] Karnam S, Basimi S, Surapaneni H, Basapogu S, Gantala R. Severely resorbed edentulous ridges: a preventive prosthodontic approach – a case report. *J Clin Diagn Res*, 2015, 9(10):ZD17–ZD19.
- [9] Bansal R, Kumar M, Garg R, Saini R, Kaushala S. Prosthodontic rehabilitation of patient with flabby ridges with different impression techniques. *Indian J Dent*, 2014, 5(2):110–113.
- [10] Magnusson BC, Engström H, Kahnberg KE. Metaplastic formation of bone and chondroid in flabby ridges. *Br J Oral Maxillofac Surg*, 1986, 24(4):300–305.
- [11] Crawford RWI, Walmsley AD. A review of prosthodontic management of fibrous ridges. *Br Dent J*, 2006, 199(11):715–719; quiz 740–741.
- [12] Liddelow KP. The prosthetic treatment of the elderly. *Br Dent J*, 1964, 117(5):307–315.
- [13] Osborne J. Two impression methods for mobile fibrous ridges. *Br Dent J*, 1964, 117(6):392–394.
- [14] Watson RM. Impression technique for maxillary fibrous ridge. *Br Dent J*, 1970, 128(11):552.
- [15] Chandrasekharan NK, Kunnekel AT, Verma M, Gupta RK. A technique for impressing the severely resorbed mandibular edentulous ridge. *J Prosthodont*, 2012, 21(3):215–218.
- [16] Manoj SS, Chitre V, Aras M. Management of compromised ridges: a case report. *J Indian Prosthodont Soc*, 2011, 11(2):125–129.
- [17] Ladha K, Gill S, Gupta R, Verma M. Neutral zone approach for the rehabilitation of a severely atrophic mandibular ridge: case report. *Gen Dent*, 2012, 60(3):e166–e169.
- [18] Păuna MR, Babiuc I, Farcașiu AT. Prosthodontic management of an extreme atrophy of the mandible correlated with a prominent genial tubercle – a clinical report. *Rom J Morphol Embryol*, 2015, 56(2 Suppl):867–870.
- [19] Chen JH, Huang HL, Lin YC, Chou TM, Ebinger J, Lee HE. Dentist–patient communication and denture quality associated with complete denture satisfaction among Taiwanese elderly wearers. *Int J Prosthodont*, 2015, 28(5):531–537.
- [20] Gaspar MG, Dos Santos MB, Dos Santos JF, Marchini L. Correlation of previous experience, patient expectation and the number of post-delivery adjustments of complete dentures with patient satisfaction in a Brazilian population. *J Oral Rehabil*, 2013, 40(8):590–594.
- [21] Komagamine Y, Kanazawa M, Kaiba Y, Sato Y, Minakuchi S, Sasaki Y. Association between self-assessment of complete dentures and oral health-related quality of life. *J Oral Rehabil*, 2012, 39(11):847–857.
- [22] Papadaki E, Anastassiadou V. Elderly complete denture wearers: a social approach to tooth loss. *Gerodontology*, 2012, 29(2):e721–e727.
- [23] Madhuri S, Hegde SS, Ravi S, Deepti A, Simpy M. Comparison of chewing ability, oral health related quality of life and nutritional status before and after insertion of complete denture amongst edentulous patients in a Dental College of Pune. *Ethiop J Health Sci*, 2014, 24(3):253–260.

#### **Corresponding author**

Livia-Alice Tănăsescu, Assistant, MD, PhD, Department of Removable Prosthodontics, Faculty of Dentistry, “Carol Davila” University of Medicine and Pharmacy, 37 Dionisie Lupu Street, 020021 Bucharest, Romania; Phone +40723–980 203, e-mail: tanasescualice@gmail.com

*Received: February 5, 2016*

*Accepted: September 29, 2016*