

Overdentures and masticatory efficiency: literature review

Abstract / Overdenture is defined as a completely or partially removable denture that covers or is supported by one or more remaining natural teeth, roots and / or dental implants. This study aims to examine the masticatory efficiency and patient acceptability of overdentures compared to conventional dentures. A literature review was performed to analyze the importance of dental prosthetic treatment to provide patients with proper function and optimal esthetics.

Keywords / Overdenture. Complete denture. Dental prosthesis.

Jovani **Busetti**

Specialist in Dental Prosthesis, Cruzeiro do Sul University.

João Paulo **De Carli**

PhD in Stomatology, Catholic University of Paraná (PUCPR).

Dimas João **Rodrigues Neto**

MSc in Dental Prosthesis, University of Southern Santa Catarina (UNISUL).

Jefferson Ricardo **Pereira**

Professor at the Specialization course in Dental Prosthesis, Cruzeiro do Sul University.

How to cite this article: Busetti J, De Carli JP, Rodrigues Neto DJ, Pereira JR. Overdentures and masticatory efficiency: literature review. Dental Press Implantol. 2013 Oct-Dec;7(4):34-7.

Submitted: September 07, 2013 - **Revised and accepted:** September 11, 2013

Contact address: Jefferson Ricardo Pereira
Rua Recife, 200 – Apto 601 – Tubarão/SC – CEP: 88701-420 – Brazil – E-mail: jeffripe@rocketmail.com

» The authors inform they have no associative, commercial, intellectual property or financial interests representing a conflict of interest in products and companies described in this article.

INTRODUCTION

Complete denture wearers have a great limitation because of bone loss resulting from the continuous resorption process, which affects the retention and stability of these appliances. The replacement of lost gum tissue by complete dentures is a problem for both the dentist and the patient.

Additional retaining elements, such as remaining roots or implants, can be used to minimize these potential problems and improve the performance of complete dentures. There are several denominations in the literature for this type of treatment, the most common being overdentures.¹

Overdenture is defined as a partial or complete denture that covers or is attached to one or more natural remaining teeth, roots and / or dental implants,² aiming at improving patient's masticatory function and comfort. The esthetic and phonetic aspects will also be greatly improved. These types of implant- or tooth-retained prostheses may be rigid or semi-rigid.²

This paper aims to compare, through a literature review, the masticatory efficiency between overdentures and complete dentures.

LITERATURE REVIEW

Adequate planning addressing edentulous patients helps to ensure satisfactory results both esthetically and functionally. Overdentures provide considerable freedom during tooth mounting and allow issues involving placement of implants or tooth-supporting structures to be corrected, thus solving occlusal and esthetic discrepancies.³

Some clinical limitations prevent the use of fixed dentures on implants. In these cases, rehabilitation with overdentures is indicated for esthetic, phonetic and chewing purposes, as well as for economic convenience.⁴

Teeth and roots need to be in good periodontal health and favorable position to support tooth-retained overdentures. Because these conditions are not always met, the advent of osseointegrated implants has significantly impacted restorative dental procedures, enabling implant-retained overdentures in a large number of cases.¹

For a long time, tooth roots were used to promote greater retention and stability to removable dentures. With the development of osseointegrated implants and predictability of this treatment modality,^{15,16} the use of roots with retention appliances has become increasingly rare. However, adding retainers to natural roots that would otherwise be extracted is also a therapeutic option for patients, particularly when an implant is contraindicated. Oral rehabilitation using dental roots increases retention and stability of removable dentures, especially because it is a cost-effective treatment.⁵

Tooth-retained overdentures are a rehabilitative treatment option with the advantages of conventional full denture plus that fact that it provides greater retention offered by dental prostheses cemented on pillar teeth. Overdentures using resilient anchoring systems are an alternative for the rehabilitation of partially edentulous patients whose remaining teeth present unfavorable conditions to support fixed or removable partial dentures, providing finer comfort through a more stable reconstruction.⁶

The ideal retention system for overdentures should provide the prosthesis with good retentiveness and stability, so that no great loss of retention capacity occurs over time. It should have easy and inexpensive maintenance, if a replacement is needed. In addition, it should present little height so that it can be used in reduced intermaxillary spaces, which favors esthetics. It must also have biomechanical capacity to help distribute load-bearing forces across the implants and surrounding bone in implant-retained cases.⁷

Implant-retained overdentures in the mandible have been reported throughout the literature with success rates similar to implant-retained dentures (particularly, implant-retained prostheses). However, the most appropriate dental implant system remains controversial.¹⁸

Implant-retained overdentures function similarly to conventional complete dentures, predominantly mucous-retained, but appliance retention and stabilization are vastly improved by fixing the implants, either as an implant-retained or as mucus-supported overdenture.⁸ Implant-retained mandibular overdenture fused to an

infrastructure allows considerable retention and stability, as well as restores patient's masticatory function, safety and well-being.^{8,9}

Edentulous patients show great dissatisfaction with complete mandibular dentures, according to case reports found in the literature.^{11,12} Masticatory function, speech, quality of life and even nutrition significantly improve when implants are placed into the anterior mandible to support and stabilize an overdenture. Implant-retained overdentures with ball-head attachments provide the patient with greater comfort and masticatory function when compared with conventional full dentures. Patients also feel satisfied because the retention and stability provided by the attachment system enables them to return to social life.^{8,10}

Dental implants allow placing the teeth in positions that favor esthetics and phonetic functions. The use of ball-head attachments has demonstrated to be a sensible and economic method due to its relatively low-cost and ease of manufacture and maintenance. This type of treatment provides retention and stability to prosthetic treatment, allowing an increase in masticatory efficiency, safety and improvements in patient's psychological factor and self-esteem. It has biomechanical advantages because of the freedom of movement for the user due to the resilience of the prosthetic socket. It is a rehabilitation option with a prognosis as good as the protocols established by Brånemark for fixed full dentures.^{8,11,14,15}

The market offers a variety of retention systems of different brands, each one with its own characteristics, advantages and disadvantages, which can be indicated for distinct clinical cases.^{8,12}

Among the denture attachment systems used to support overdentures, there are bar-clip systems, ball-sockets, magnets and telescopic crowns.^{8,13}

Choosing the most appropriate denture attachment system will depend on (1) the number of implants or teeth; (2) the location of the implant or teeth; (3) the convenience and / or prosthetic viability; and (4) the cost.¹

Dental magnets provide the least strength retention and lose their retaining capacity in a shorter period of time when compared to other attachment systems. However, they are easier to handle and have a lower stress transmission to the intermediate pillars.¹⁴

Bar-clip and ball-socket attachments have a higher degree of retention than the other systems, and are most recommended for advanced atrophy of the alveolar crest and in cases requiring greater retention and stabilization.¹³

It is reasonable to consider that prosthetists should know and evaluate the characteristics of each retention system, so that they can select the most appropriate system for each situation, thus making rehabilitation treatment prognosis more favorable, and increasing the longevity of the prosthetic appliance.⁷

FINAL CONSIDERATIONS

According to the literature reviewed, treatment with tooth-supported or implant-retained overdentures are an alternative to the rehabilitation of partially or fully edentulous patients, providing greater tooth retention and maximum comfort through a more stable reconstruction.

References:

1. Telles DM. Prótese total: convencional e sobre implantes. São Paulo: Ed. Santos; 2010. 492 p.
2. Glossary of Prosthodonty Terms, Edition 8. J Prosthet Dent. 2005;94(1):10-92.
3. Bacelar A. Overdentures. In: Atlas de prótese: sistemas de encaixe. São Paulo: Artes Médicas; 2003.
4. Frossard W, Ferreira HMB, Balassiano DF, Groisman M. Grau de satisfação do paciente à terapia de sobredentadura inferior implanto-retida. Rev Bras Odontol. 2002;59(1):50-3.
5. Alves MR, Silva FA, Silva LLB, Silva WAB. Sobredentaduras sobre raízes: uma alternativa aos implantes osseointegráveis. RFO UFP. 2010;15(3):309-13.
6. Botega DM, Mesquita MF, Henriques GEP. Uso do sistema ERA para confecção de overdenture. RGO: Rev Gaúch Odontol. 2005;53(3):210-2.
7. Tabata LF, Assunção WG, Rocha EP, Zuim PRJ, Filho HG. Critérios para seleção dos sistemas de retenção para overdentures implanto-retidas. RFO UFP. 2007;12(1):75-80.
8. Pereira JR. Prótese sobre implante. São Paulo: Ed. Artes Médicas; 2012.
9. Fragozo WS, Tróia MG, Bozzo RO, Vedovello SAS, Vedovello MF. Overdenture Implanto-retida. RGO: Rev Gaúch Odontol. 2005;53(4):325-8.
10. Souza SA, Germano AR, Anselmo SM, Bezerra LAM, Santos ANA. Sobredentadura retida por implantes e encaixes tipo bola-relato de caso. RFO UFP. 2007;12(3):69-73.
11. Nadin PS, Linden MSL, Panisson VP, Nadin MA. Fixação de overdenture através de sistema O'Ring para implantes osseointegrados. RFO UFP. 2000;5(2):55-9.
12. Setz JM, Wright PS, Ferman AM. Effects of attachment type on the mobility of implant-stabilized overdentures an in vitro study. Int J Prosthodont. 2000;13(6):494-9.
13. Heckmann SM, Schrott A, Graef F, Wichmann MG, Weber HP. Mandibular two-implant telescopic overdentures: 10 year clinical and radiographical results. Clin Oral Implants Res. 2004;15(5):560-9.
14. Naert I, Alsaadi G, Quirynen M. Prosthetic aspects and patient satisfaction with two-implant-retained mandibular overdentures: a 10-year randomized clinical study. Int J Prosthodont. 2004;17(4):401-10.
15. Adell A, Lekholm U, Rocker B, Brånemark P-I. A fifteen-year study of osseointegrated implants in the treatment of the edentulous jaw. Int J Oral Maxillofac Surg. 1981;10:387-416.
16. Levine RA, Clem DS, Wilson TG Jr, Higginbottom F, Sol-nit G. Multicenter retrospective analysis of the ITI Implant System used for single-tooth replacements: results of loading for 2 or more years. Int J Oral Maxillofac Implants. 1999;14(4):516-20.
17. BRÅNEMARK, PI. et al. Osseointegrated implants in treatment of the edentulous jaw. Experience from a 10-year period. Scand J Plast Reconst Surg. 1977;16(1):1-13.
18. Sadowsky SJ. Mandibular implant-retained overdentures: a literature review. J Prosthet Dent. 2001;86(5):468-73.