

Article

Rehabilitation of the Completely Edentulous Mandible by All-on-Four Treatment Concept: A Retrospective Cohort Study with Up to 10 Years Follow-Up

Tommaso Grandi ¹ and Luca Signorini ^{2,*}¹ Independent Researcher, 20900 Monza, Italy; dott.grandi@libero.it² School of Dentistry, Saint Camillus University of Health Science, 00198 Rome, Italy

* Correspondence: dottluca.signorini@libero.it

Abstract: (1) *Background and Objectives.* Currently, there are no definitive long-term data about clinically significant difference in the failure of prosthesis and implant or marginal bone loss related to the rehabilitation of the completely edentulous mandible by all-on-four treatment concept. The main aim of present investigation was to report the long-term outcomes (10-years follow-up) of complete-arch mandibular rehabilitations based on the all-on-four concept. (2) *Materials and Methods.* Patients in need of extractions of teeth due to the occurrence of caries and/or severe periodontal disease and patients presented with edentulous mandibles were enrolled to the study. A total of 96 participants (mean follow-up period after intervention of 3185.2 days) were enrolled in the study. Participants were evaluated at the first visit, 10 days after intervention and every year after the intervention. Implant and prosthesis survival, bone loss and both local biological and mechanical complications were evaluated during the follow-up period. (3) *Results.* An implants' survival rate of 97.9% was observed at the end of the follow-up period. Biological complications were reported in 19.8% of patients, whereas mechanical complications were reported in 27.1% of cases. The average marginal bone level at baseline was -0.03 mm. A significant marginal bone loss was observed after 10-years follow-up (2.5 mm). Binary logistic regression analysis showed significant association between smoke and both marginal bone loss and local biological complications. Lastly, a significant association was observed between bruxism and mechanical complications. (4) *Conclusions.* The high implant and prosthesis survival rate and the moderate incidence of biological and mechanical complications observed in present investigation can be associated to several factors such as high implant primary stability, prosthetic design, and control of the occlusal forces.



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1. Introduction

The completely edentulous mandible rehabilitation represents one of the most significant oral health care rehabilitation services offered by implant prosthodontics in implant dentistry. Indeed, severe teeth loss affects more than 300 million people in worldwide, also showing an increase in the incidence for each year (3%) [1]. In this context, the implant-supported prosthesis rehabilitation for patients affected by severely atrophic mandible is challenging due to the presence of residual jawbone of very low bone quality [2]. Patients characterized with long-term complete edentulism often show these unique conditions [3,4]. In addition, it is known that posterior mandible progressive bone loss can induce the exposure of the alveolar nerve thus causing pain to patients with complete dentures [5].

In the early 2000s, several authors proposed the use of distally tilted implants as possible solution for these issues thus providing a reliable alternative for patients with severely atrophic mandible [6]. Specifically, distally tilted implants can be used in the mandibular and maxillary posterior portions in absence of bone grafting, with distal implants posterior tilting enabling the use thick bone tissue positioned in the anterior