

Summary

The loss of teeth in the upper jaw is a clear handicap for patients. There are several options for rehabilitating edentulous patients, and choosing the right course of action can be a challenge even for an experienced dentist.

Rehabilitation with implant-supported hybrid restoration can offer patients with moderate to severe alveolar ridge resorption significantly better mechanical properties, such as stability of the restoration with a retention rate approaching that of the fixed alternative and, related to this, greater confidence in speech and food processing and, due to the reduction of the palate of the removable restoration compared to the conventional removable restoration, improved taste perception.

In contrast to the fixed alternative, the hybrid implant-supported denture places less demand on both the position and number of dental implants, which avoids complicated hard and soft tissue surgical reconstruction. This leads to considerable financial and time savings.

At the same time, the removable alternative can be used with particular advantage in patients with bruxism, as it allows for easy removal of the restoration at night and thus reduces the risk of overloading the implants.

This dissertation is divided into theoretical and practical parts. In the theoretical part, the current knowledge on the problem of the edentulous maxilla, the possibilities of its rehabilitation from the conventional total removable restoration, through the fixed implant-supported bridge, and its combination with a partial removable restoration to the hybrid implant-supported removable restoration were summarized on the basis of the contemporary literature. The theoretical part continues with a detailed description of hybrid implant-supported restorations using both axial attachments and bars, and detailed documentation of the contemporary method of fabrication of hybrid implant-supported bar retained restoration using modern technology. It then concludes with a discussion of biomechanics.

The practical part of the dissertation is divided into experimental and clinical parts. The task of the experimental part was to confirm the hypothesis, based on finite element analysis (QCT/FEA), which expected better biomechanical properties of a hybrid bar-retained restoration supported by four implants in the maxilla compared to a restoration using axial LOCATOR-type attachments. The results of the experimental part confirmed the hypothesis.

The clinical part consists of a retrospective study conducted in two private dental clinics in 2018-2020, where thirty patients with bar-retained overdentures supported by four dental implants were analyzed. The results of the clinical study indicated the reliability of rehabilitation of the edentulous maxilla using bars with an implant survival rate of 92.5% over 21 years, and the Hader bar combined with plastic riders and a full resin denture appeared to be a statistically more successful alternative. In addition to the type of bar and denture, implant survival is also influenced by the condition of the dentition or prosthetic rehabilitation in the mandible, with the edentate mandible and hybrid restoration supported by the patient's own teeth having a worse score. Implant diameter, gender, or patient's age did not affect implant survival. In contrast, implant length had a statistically significant effect on implant survival with worse scores for shorter implant lengths. At the same time, according to the results of the dichotomous questionnaire, all of its users were uniformly satisfied with almost every aspect of the hybrid implant-supported bar-retained overdentures in the maxilla.

biomechanical properties than a hybrid restoration using axial attachments.

Keywords: hybrid implant-supported bar-retained denture, dental implants, axial attachments,

dental implant biomechanics