

POSTER

Implant-prosthetic rehabilitation using zygomatic implants and a carbon fiber framework

Area: Implantology Research

University/Department:

University of Genova/Department of surgical sciences

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Presenter:

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Objective:

Several protocols have been proposed to rehabilitate extremely resorbed maxillae avoiding bone-grafting.

Zygomatic implants represent a feasible treatment option. Two zygomatic implants can be placed in the posterior areas of the maxilla and traditional implants in the anterior areas or, in case of extreme maxillary atrophy, 4 zygomatic implants can be used (two for each hemiarch).

Metal is the most used material to realize passive frameworks in order to prevent micro-movements and evenly distribute occlusal loads onto the implants. However, currently there is a growing interest in composite resins. In particular, carbon fiber reinforced composites (CFRC) provides similar stiffness and rigidity compared to metal and optimal biocompatibility. Compared to metal frameworks, CFRC frameworks present some advantages: they are cheaper, easy to produce, they allow chemical adhesion to the veneering resin and they are lighter. Such characteristics appear to be advantageous for the manufacturing of immediately loaded prostheses supported by zygomatic implants.

The aim of this study was to evaluate clinical outcomes of immediately loaded zygomatic implants using a full-arch fixed prostheses provided with CFRC frameworks

Materials:

Between March 2017 and September 2017, 18 patients (13 women, 5 men) with severely edentulous resorbed maxillae or patients with failed GBR augmentation were identified for this study. Patients presented with a mean age of 62 years (range: 53 – 78) and were treated with fixed screw-retained prostheses supported by zygomatic implants in the posterior areas and traditional implants in the anterior areas (n= 3) or four zygomatic implants, two for each hemiarch (n= 6) or four zygomatic implants and traditional implants in the anterior areas (n= 2).

A plaster impression was taken after surgery, and prostheses were delivered within 24/48 hours.

The prosthesis presented a carbon fiber framework, veneered with composite resin occlusal material.

The carbon-fiber reinforced composite (CFRC) (Bio Carbon Bridge system Micromedica) is composed of unidirectional fibers that has good basic mechanical properties and, moreover can be adapted to the framework shape without the necessity of cutting the fibers to incorporate the implant cylinders, that may increase the mechanical characteristics of the final framework.

All the prostheses were provided with balanced occlusion and nightguards were delivered to the patients.

Patients were evaluated at the 1-year follow-up and cumulative survival rate (CSR) as well as periodontal parameters were evaluated (BoP, PI, PD). Technical and biological complications were also recorded.

Results:

80 implants have been inserted (45 zygomatic and 35 classic implants).

At the 1-year follow-up, no patients dropped out. One implant was removed 4 months after implant placement due to an infection in a heavy smoker patient. Despite the removal of the implant, the prosthesis was kept in place maintaining the remaining implants as support. Implant CSR was of 98,8% and prosthetic CSR was 100%.

The values of BOP and PD of peri-implant soft tissues never exceeded the physiological levels.

Conclusion:

On the base of the present study, implant rehabilitation with zygomatic implants and fixed prostheses provided with a carbon framework appears to be a valid treatment option in case of severely atrophic maxillae, with high success rate in the short term period.