

Improving PMMA resin using graphene oxide for a definitive prosthodontic rehabilitation

This case report describes a maxillary rehabilitation with a fixed dental prosthesis that combined a vertical preparation technique without a finish line, intraoral digital impressions, a 3-dimensional facial scan and a monolithic prosthesis made from polymethylmethacrylate (PMMA) reinforced with graphene. The dental preparation technique ensured the stability and health of soft tissues. The combination of the 3D facial scan with digital intraoral impressions, besides improving the communication between the clinicians and the labs, also allows giving the patient an idea of the prospective treatment. Graphene is one of the crystalline forms of carbon and has extraordinary properties. Its incorporation in acrylic resins is a suitable option for prosthetic rehabilitation.

Patient's data:

75 years old women patient.

Implants surgery and Immediate loading on March 4, 2018.

Implants: Neobiotech EB 4X11 / Abutment multiunit 2 mm gingiva height and distal implants 17° angulation.

Definitive prosthesis was placed on March 17, 2018

No relevant medical history or allergies.



Fig. 1: Initial clinical situation.

A) Extraoral view of smile.

B) Frontal view of maximum intercuspation.

C) Occlusal view of the maxillary.

D) Panoramic radiograph.



Fig. 2:

A) Occlusal view of the maxillary after removing metal-ceramic restorations.

B) Occlusal view of the maxillary after vertical preparation.

C) Digital impression of the prepared teeth after a healing period.

D) Virtual image of the facial scan aligned with the digital intraoral impression of the prepared teeth in maximum intercuspation. E)

F) Virtual image of the facial scan aligned with the digital intraoral impression of the provisional prosthesis in maximum intercuspation and in smile position.

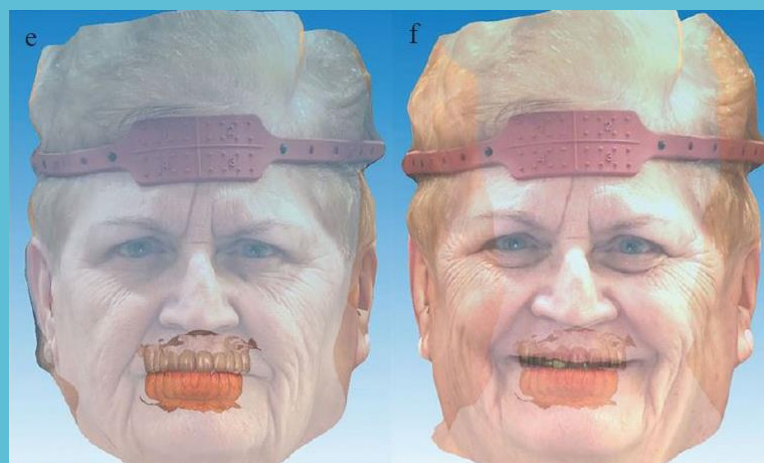




Fig. 3:

A) Wax try-in denture.

B) 3D-printed working cast.

C) Definitive fixed dental prosthesis made from PMMA reinforced with graphene.

D) Post-treatment extraoral view of smile.

E) Frontal view of the definitive maxillary fixed dental prosthesis made from PMMA reinforced with graphene.

Placement on March 17, 2018



First annual review on January 8, 2020



Second review on February 15, 2022

