

# HIGHLY COMPLEX MAXILOFACIAL RECONSTRUCTION FOR ONCOLOGIC PATIENT WITH CUSTOMIZED IMPLANT

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## ABSTRACT

The use of 3D technology for planning the reconstructive surgery and producing custom implants and surgical guides has gained importance as a tool that provides surgeons with the ability to accurately plan each patient's treatment, reducing surgical time and its associated risks.

This work describes the development of a reconstruction solution for a female patient, with multiple maxillofacial injuries caused by ossifying fibroma, requiring reconstruction of the eye socket, malar and right hemimaxilla. The surgical planning included the oral rehabilitation, the design of the surgical guides and the anatomic implants. The mechanical strength of these implants was analyzed by finite element analysis (FEA) considering occlusion loads which can occur after oral rehabilitation.



# TECHFIT

## MATERIALS AND METHODS

### Case analysis

Female patient, 45 years old.  
Diagnostic: Ossifying fibroma and polypoid chronic sinusitis with injuries of right hemimaxilla, right exophthalmos with epiphora, nostril and choana damage compromising the right sphenoid sinus.

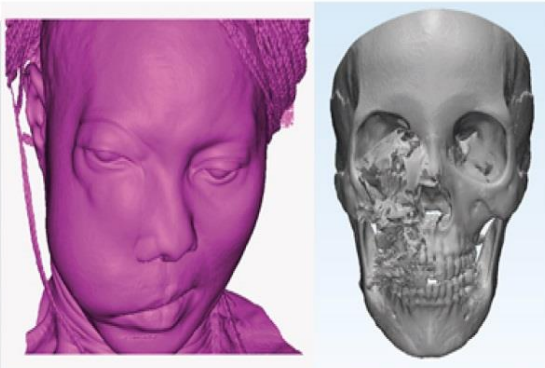


Figure 1: Soft tissue and bony injuries

### Implant design

The future oral rehabilitation was considered and the left hemimaxilla was designed according to the natural angle of the occlusal plane, leaving the interface prepared for subsequent attachment of dental implants.

The walls and floor of the right eye socket were manufactured in PEEK and it was assembled to the main structure of the anatomic implant manufactured in titanium, the difference on materials was considered in order to not compromise the main structure of the implant in the case of any complication with complete tumor resection.

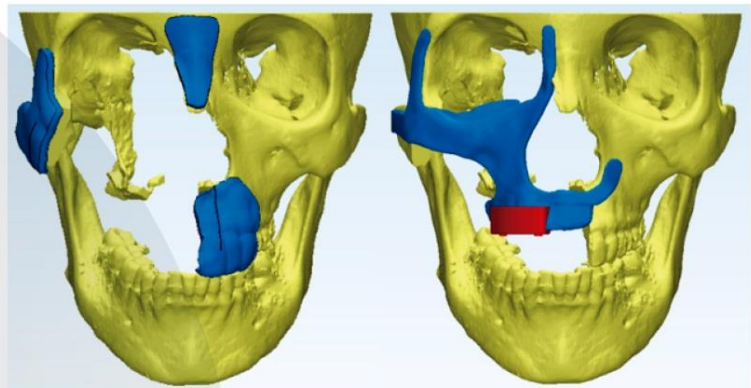


Figure 2: Osteotomies planning and design of the surgical guides and implant