

## Dentistry 2019: Total mandibular reconstruction with total custom titanium prosthesis in segmented microvascular fibula

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The objective of this work is to show a new surgical protocol in high complexity reconstructions in the mandibular skeleton, predicting more stable results and a greater chance of rehabilitation with integral bone implants. This surgical case is the first made in the world. Until then, we only have cases of the most varied types of mandibular reconstructions, either microvascularized or autogenous grafts isolated or with plaques of reconstruction, not guaranteeing a stable long-term result for the patient mutilated by extensive segmentations caused by benign or malignant oral pathology.

Therefore, in this particular case, it shows a case of a patient with extensive ameloblastoma, who in a first surgical phase, was performed full mandibulectomy with a wide margin of safety and microvascular fibular graft with green-breasted fibular segmentation, grafted bone graft interposition bioass, rhBMP-2 and osteosynthesis with miniplates and 2.0 screws. After a few months after surgery, the appearance of the microvascular fibular graft was morphologically in poor position, with vertical height exaggerated due to the high degree of angulation of the fibula, fibrosis in the stumps grafted with, bone instability to withstand chewing forces for future rehabilitation with osseointegrated implants.

Therefore, a replacement surgery, with extra-oral access, segmentation of the fibular graft in specific areas and studied in virtual planning and manufacture of the entire mandibular prosthesis in custom titanium, with height and mandibular shape, thicknesses at strategic locations as a zone of traction and compression, also on predict the precise locations for placement of the implants and their complete rehabilitation. In literature thus far, there are not any such extreme cases available, only cases of mandibular hemi-prosthesis. during this case, it's necessary to debate the technique, virtual evaluation and imaging, so as to market a rehabilitative surgery with extreme stability, predictability and establish normal functionality to the patient.

The use of virtual surgical planning and computer-aided design/computer-aided manufacturing has been reported to reinforce the design for the reconstruction of mandibular continuity defects. This case report illustrates the utilization of this technology within the fabrication of a custom-made titanium prosthesis to revive a segmental mandibular defect. the planning specifications and sequence of the custom-made titanium prosthesis are discussed. Although successful during

this case, there are limitations in its application and case selection is of important importance.

Reconstructive options for mandibular continuity defects have included the use of microvascular free flaps, free bone grafts, and alloplastic implants including titanium reconstruction plates and titanium trays. With the establishment of these reconstructive options, advances in three-dimensional (3D) imaging software, virtual surgical planning (VSP), and computer-aided design/computer-aided manufacturing (CAD/CAM) have further enhanced the planning and application of these options in restoring mandibular defects.

Advantages of this technology have included visualization of tumor margins, definition of surgical margins, fabrication of surgical templates or cutting guides, assessment of continuity defects, and the identification of ideal bone dimensions and shape for reconstruction. Regardless of the reconstructive option, this technology has aided the surgeon in reducing operating time and minimizing errors during the surgery. In recent years, this technology has also been used in the fabrication of custom-made prostheses. In this article, we would like to report on a case in which a custom-made mandibular prosthesis was fabricated to reconstruct a mandibular continuity defect.

### References:

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