EDITORIAL

# Does Complete Digitization in Maxillofacial Rehabilitation Become a Reality in Near Future?

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*International Journal of Prosthodontics and Restorative Dentistry* (2019): 10.5005/jp-journals-10019-1245

Maxillofacial deformities may be congenital in origin due to developmental disturbances or acquired due to trauma or pathologies. Maxillofacial defects create an embarrassing situation which negatively affects the psychology of the patient and leads to physical, social, and familial problems. Reconstruction of the defect is usually done by plastic surgery, but many a times artificial reconstruction is required with the help of maxillofacial prosthesis.[1]

For the past few decades, the fabrication of craniofacial prostheses has shifted from impression-based fabrication to rapid prototyping maneuvers, in addition to the integration of implantology to enhance the physical retention of these artificial organs. With the use of computer-aided design and manufacturing (CAD-CAM), patient-specific diagnostic assessment and restoring the native anatomy of craniofacial defects is becoming more and more effective.[2]

Recent studies show that there has been a significant increase in the reported usage of digital technologies in maxillofacial prosthetics. A systematic review was conducted by Farook et al. to evaluate the articles related to digital image processing for the fabrication of maxillofacial prosthesis. The authors stated that the CAD-assisted mirroring technique was most popular for orbital prosthesis and auricular prosthesis. They found that digital design for ocular prosthesis still remained a challenge for the maxillofacial prosthodontist.[3]

Ferreira et al. forecast the development of a new prostheses for maxillofacial facial reconstructions in future using CAD-CAM, engendering and surgical guides that act as a substitute to bone tissue without any requirement of bone grafts. This prosthesis reduces the morbidity and the recovery time.[4] Nuseir et al. introduced a complete digital workflow to construct a nasal prosthesis and compared it to the conventional workflow of a patient requiring a nasal prosthesis. The prosthetic nose fabricated using digital workflow had acceptable esthetics with enhanced prosthesis reproducibility and acceptability.[5]

Elbashti et al. studied the application of various types of digital technologies in maxillofacial prosthetics by identifying digital technologies and their characteristics and reviewing the prevalence of applied digital technologies and their recent trends in the maxillofacial prosthetics literature. They found a notable increase over the past 10 years in all digital technologies used except for evaluation technologies, which remained almost constant. The most published articles were from the Asia-Pacific region (44%), followed by North America (22%) and Europe (20%).[6]

Elbashti et al. created a digitized database of fabricated obturators to be used for the rapid rehabilitation of the patients during disaster. The surfaces of an acrylic resin obturator were scanned and saved as a single standard tessellation language (STL) file with the help of three-dimensional modeling software. A simulated obturator model was manufactured accurately from these data and used during emergency situations.[7] Elbashti et al. had proposed a future model and suggested to extend overseas maxillofacial prosthetic collaboration activities carried out between several developing countries and developed countries. According to them, the model includes asynchronous and synchronous collaboration patterns through network-effective persistent information sharing. The asynchronous activities will be supported through a web-based collaborative environment that enables navigation of collaboration contents. The synchronous collaborative works on maxillofacial prosthetic cases through real-time high-quality digital data delivery and by bringing the database objects to a shared workspace.[8]

Although there is digital advancement in the fabrication of maxillofacial prosthesis, but due to certain limitations it cannot be completely shifted to digital fabrication as final parts of prosthesis fabrication require conventional human intervention. Introduction of new technologies and techniques in the field of maxillofacial prosthodontic needs changes in recent treatment protocols, advance training of the operator, and workflow setting to meet the challenges in the near future.

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**How to cite this article:** Mishra SK, Chowdhary R. Does Complete Digitization in Maxillofacial Rehabilitation Become a Reality in Near Future? Int J Prosthodont Restor Dent 2019;9(3):67–68.

**Source of support:** Nil

**Conflict of interest:** None

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