



## Digital Dentistry and Complete Dentures

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It has been around 80 years since protocols and methods of complete denture fabrication procedures were introduced. Complete denture (CD) fabrication is a complex process and requires certain clinical steps and expertise of a laboratory technician. The complexity of the procedures is the reason why digital impressions/scanning has evolved and is becoming more frequently used in clinical prosthodontics [1]. Since the introduction of Computer Aided Design/ Computer Aided Manufacturing (CAD/CAM) technology for CDs, many improvements in the systems have been noticed. Due to the innovations in the digital impression systems, the data of the patient can be effectively recorded and converted into a virtual impression [2].

Back in 2014, a two stage procedure of fabricating a CD using CAD/CAM system was introduced and the method has been effectively performed on patients [3]. AvaDent (AVADENT Scottsdale, AZ, USA) and DentCa system (DENTCA, Torrance, CA, USA) are two systems which enables the clinician to record impressions, jaw relationships and teeth positioning with an anatomic measuring device provided by the manufacturer. Using a patented DentCa system impression tray, an impression of an edentulous ridge can be recorded within 45 minutes during first appointment and sent out for further processing. With these technological advancements, only a couple of appointments are needed for the patients to get their new dentures made since all the important clinical steps could be completed during the 1<sup>st</sup> patient visit. This saves a lot of time and materials for both clinician and the patient. Even though many advancements have been made in digital dentistry, the traditional methods of fabricating complete dentures is widely acceptable and is still practiced in majority of the teaching hospitals throughout the world.

If we compare the technique of fabricating CDs using digital techniques with the conventional technique, the digital workflow has many advantages. The data which is stored within the manufacturer's database allows us to fabricate a spare or a replacement denture rapidly. The dentures which are produced using CAD/CAM are milled from the pre-polymerized acrylic resin materials. Pre-polymerized acrylic is produced under high heat and pressures and will not under-go any polymerization shrinkage like conventionally mixed acrylic resin. As a result, there are decreased porosities within the resin material resulting in reduced surface roughness and thus, lesser bacterial and *Candida albicans* accumulation consequently [4]. A CAD/CAM denture also reduces the risk of *Candida*-associated denture stomatitis during their long-term use. The lack of polymerization shrinkage associated with milled dentures results in a denture fit which is highly accurate offering improved retention and thus, reduced frequency of traumatic ulcerations [5].

There are certain challenges which may be encountered during CAD/CAM denture fabrication. The CAD/CAM system initially requires heavy investment and requires significant training for its use [6]. The CAD/CAM materials are expensive and impression taking, occlusal vertical dimension recording and maintenance of lip profile could be a challenge for under-trained professionals. The denture trial stage is not done during CAD/CAM complete denture fabrication process and thus, evaluation of the denture by the dentists and patient is not usually possible. Despite the disadvantages, the CAD/CAM systems will allow the clinicians to standardize the quality of the prosthesis within decreased span of time. More significantly, the potential to reduce the inaccuracies in clinical procedures and minimizing the risk of cross-infection is also major benefit offered by the digital scanners used in dentistry.

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