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# Dental Differences in 3D Printer and CAD-CAM Milling

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## Abstract

Digital dentistry has grown in popularity over the last two decades, with applications in crowns, bridges, inlays, onlays, and prosthetic rehabilitation of facial defects. The first 3D printer machine was in late 1980, during this time increased of using of 3D printer in medical field. Stereolithography (SLA) is a 3D printing technique that uses a computer to control the movement of a laser beam. CAD/CAM milling can be used for dry or wet milling restoration with high aesthetic value. CAD/CAM milling makes communication with labs easier and faster than traditional methods.

***Keywords:*** CAD CAM milling; 3D Printer; digital dentistry

## Introduction

Digital dentistry included 3D printer and CAD/CAM imaging and milling systems. 3D printer known for high quality and easy modeling of prosthesis. Many years ago 3D printers were only available for the major dental laboratories , currently they are popular, widespread and widely used in all dental laboratories The operation of a 3D printer is dependent on light or laser, which polymerizes liquid with computer-guided polymerization to create objects with exquisite details [1].

## Dental Differences in 3D Printer and CAD-CAM milling

3D printer depends on stereolithographic technique, it is a very sophisticated technique of layer manufacturing process, where powder material printing or joining the process while liquid material liquid polymerization or stereolithographic process in laser or photo masking process. Stereolithographic technique is most important additive manufacturing technologies involves curing or solidification of liquid photosensitive polymer through use of an irradiation light source which supplies the energy needed to induced chemical reaction. There is 2 types of stereolithographic process two-photon polymerization process and single photon polymerization process [2, 3].

The 3D printer phase 1-scan using an intraoral scanner, take a digital impression. Send the scans to a laboratory. 2-design Import the digital scan into design software (CAD) and create your design. 3-Print once the design is finished, load the file into print preparation software to begin the printing process. 4-Prepare the printed pieces for washing, drying, and post-curing. Cobalt-chromium and zircona are the materials utilised in 3D printers. We can produce bridges, crowns, Hawley retainers, and full dentures using 3d printers. There are three basic techniques employed in 3d printers: stereolithography (SLA), digital light processing (DLP), and material jetting. Each technology can provide the precision and accuracy required for dental applications, although quality varies across equipment and systems [3-5].

In new digital dentistry, intraoral scanners eliminate the need for impression material, trays, wasting time, and storing casts after the case is completed by software system for each patient capturing correct impression within seconds and communicating to lab with a single click.

All ceramic materials such as leucite, lithium disilicate glass-ceramics, and zirconia are used in CAD CAM. Dental ceramics are the most natural appearing replacement for missing tooth substance available in range of shades & translucencies. zirconia has the highest fracture strength in all all-ceramic materials, and consistently enabled the most esthetic. Uses digital information about tooth preparation or a pattern of the restoration to provide a computer Aided Design (CAD) on the video monitor for inspection and modification. The image is the reference for designing a restoration on video monitor. Computer translates this 3-D image into a set of instruction to guide a milling tool CAM in cutting the restoration from a block.

## Conclusion

As a novel digital dental technology, multiple experiments are required to demonstrate its efficacy in relation to these techniques a beneficial technique to make our lives easier.

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