Short Communication

Is computer aided design-computer aided manufacturing including to Pediatric Dentistry?

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ABSTRACT

A variety of CAD-CAM systems have been utilizing for fabricating restorations. CAD-CAM systems perform the fabrication by two way, substractive and additive methods. Lately additive based technologies have obtained more popularity. At the same time, CAD-CAM systems have been applied for pediatric dentistry anymore. In this article, we review the recent developments and using in pediatric dentistry of CAD-CAM technologies.

Key words: CAD-CAM, Pediatric dentistry, Additive methods

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INTRODUCTION

The conventional manufacturing approach that is employed for the purposes of producing fixed partial denture (FPD) metal frameworks utilizes what is known as the lost-wax technique.[1] This technique involves the administration of local anesthesia, preparation of abutment teeth, forming of impressions and models, waxing up of the FPD framework and finally casting.[2] Unfortunately, a large number of technical drawbacks are typically associated with this manufacturing technique. These include, but are not limited to, patient discomfort, imprecise marginal fit and metal framework distortion.[3] In recent years, specialists have employed both computer-aided design (CAD) and computer aided manufacturing techniques (CAM) to improve accuracy overcome these problems. Using these techniques specialists are able to digitalize the prepared abutment teeth, produce a virtual design of the FPD frameworks and then manufacture the prosthetic using a computer aided manufacturing (CAM) process.[4]

NEW METHODS

The CAM systems that are currently used to fabricate dental prostheses utilize two manufacturing approaches: The substractive approach, which is used to mill pre-formed dental blanks; or "the additive approach," which is used in the stereolitography, robocasting, ink-printing and selective laser sintering methods.[5]

The selective laser sintering method involves the use of a powder-based layer-additive manufacturing technique that produces prototypes and the required tooling quickly in a quick and efficient manner. Laser beams, which operate in either continuous or pulse mode, provide a source of heat that scans and joins powders in predetermined sizes and shapes of layers that directly correspond with the cross sections produced during the CAD phase or stereolithography.[6]

NEW MATERIALS

In recent years, cobalt-chromium-based soft milling blanks that are suitable for the substractive approach have been introduced to the dental market. The manufacturer of these components claims that the wax-like texture of the blanks results in a significant reduction in the total manufacturing time than that required in the conventional milling of solid Co-Cr blanks. The producers also claim

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that the milled FPDs offer mechanical and biological properties that are comparable with those employed in conventional manufacturing techniques.[7]

PEDIATRIC DENTISTRY

Not only adult patients, but also pediatric patients are being treated by CAD-CAM systems with great success today. Especially, primary molars and broken-down permanent first molars are placed utilizing chairside CAD/CAM technology. All things considered about pediatric patients, CAD-CAM technology with speed, precise and short time may be a better solution in the future.[8]

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