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3D Printed Full Coverage Crowns – A Case Report and Laboratory Protocol

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The additive technologies characterize with layered manufacturing of the objects from 3D model data. They ensure production of precise complex details from various materials with no waste. The purpose of the present case report is to demonstrate the implementation of additive technologies in everyday prosthetic practice for crowns and model fabrication and compare it to the conventional laboratory protocol.

Materials and methods: Two molar full coverage crowns of our patient need replacement. A polyvinylsiloxane impression is taken and scanned in *3 Shape D750* laboratory scanner instead of pouring a gypsum cast. The sequence of working procedures is tracked from 3D scanning, through computer aided design to layered structuring of the restorations – provisional crowns and press-ceramic patterns via stereolithography in 3D printer *Rapidshape D30*. The light curing polymer *Next Dent Model* is applied for the model production and *Next Dent Cast*- for the patterns.

Very precise models, provisional crowns and press-ceramic patterns are being fabricated via the CAD-CAM system where the CAM unit is stereolithographic 3D printer. Final press-ceramic crowns of high accuracy of fitting and margins are obtained. The most frequently applied additive technologies in the dentistry and the working principle of CAD-CAM systems are presented parallel to the stereolithographic approach. A comparison between conventional crown fabrication and 3D printing highlights the numerous advantages of the innovation – time and manpower saving, possibility for production of complex shapes of various materials, minimal risk of laboratory mistakes, dimensional stability of the patterns, high accuracy and precise margins of restorations.

Biography:

Dr. Tsanka Dikova is associate professor at Faculty of Dental Medicine, Medical University-Varna, and Bulgaria. She teaches students in Dental medicine and dental technicians on dental materials and technologies for production of dental constructions. National expert in Materials Science since 2013 she had worked as Fulbright professor in the USA and Japan. Author of 3 books, 4 textbooks and more than 90 papers in the field of dental and implant materials, nanomaterials for medicine, application of lasers and additive technologies in dentistry. Guest lecturer in India, Turkey, Macedonia, China, Poland and France, Member of the Academy of Dental Materials