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Short Communication
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Digital Dental Era

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Short Communication

Comprehensive dental care, today, require novel and more conservative treatment modalities besides clinical experience and skills. Dental technology and laboratory procedures have also become more automated and digitalized, parallel with the development of new techniques and materials. Digital dental technologies offer many advantages such as cost-effective production of dental restorations as well as minimizing the need for personal technical skills and environmentally harmful waste in a dental laboratory. Also chairside applications of such technologies in dental offices ease fabrication of more standardized and optimized dental restorations with the aid of computer-controlled parameters.

Digital dental technologies can be basically classified either as chairside, laboratory or centralised fabrication in a production center [1]. These technologies involve computer-aided design and manufacturing (CAD/CAM) systems using milling dental restorations from prefabricated blocks made from metals, ceramics, polymers or resin composite dental materials. This type of production is known as the subtractive method. Additive digital dental technologies make use of 3D printing, stereolithography, selective laser sintering or melting, inkjet printing [2].

Mainly used dental restorative materials for these technologies include metals, ceramics, resin composites and polymers.

Metals

These include cobalt-chromium, titanium and titanium alloys and rarely precious metal alloys due to their high costs.

Ceramics

Feldspathic and silica (lithium disilicate, lithium silicate) based ceramics, infiltration ceramics with lanthanum glass, oxide ceramics (aluminium oxide and zirconium dioxide) offer both esthetics and durability as dental restoratives. However, due to bearing both higher stability and esthetic outcome, lithium disilicate ceramics occupy a great interest in the field for both anterior and posterior group dental restorations [3]. Likewise yttrium stabilised zirconium dioxide based restorations play an important role for especially posterior group dental restorations where mechanical strength to resist occlusal forces is of primary importance [4].

These ceramic materials can be in the form of presintered (green stage) blanks/blocks or sintered blanks in various shades as monochromatic and even in layered, multi-coloured forms for direct milling both for chairside and laboratory applications.

Resin composites

Currently used resinous materials for digital dentistry are mainly the nanohybrid composites with superior wear, esthetics, polishability and durability characteristics. These are provided by the agglomerated nano-clusters interspersed with micro-sized particles. Some CAD/CAM resin blocks include zirconium oxide nano-clusters for increased mechanical strength [5].

Above mentioned materials can be milled out of a wide range of blocks or additively sintered in full contour or as framework dental restoratives to be layered then on according to individual patient need for strength, esthetics and durability.

With the aid of these wide range of materials and technologies, single-unit, multi-unit dental restorations, implant abutments and suprastructures, surgical guides for implant placement can be successfully applied as routine dental treatment.

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