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Design and ProductionA-PRO MULTIMEDIA www.apro.com.hk

Digital Dentistry

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Dr. Albert MP LEE

Computer technology, scanners and software have been developed in recent years for application in various aspects of dentistry. Nowadays many dental procedures can be assisted by these new technologies to facilitate dental clinicians in diagnosis, treatment planning, patient education and even delivery of treatment procedures. One of the remarkable applications is developed in orthodontics for the treatment of malocclusion. The procedures involve simply taking dental impressions of both the upper and lower arches. A computer scanner is then used to scan the impressions and a 3-D digital image of the dental arches is created by the computer software. According to instructions by the clinician, a 3-D virtual course of treatment is generated in the computer and custom-made aligners are made in a series of minor tooth movements until the set of teeth is moved to an ideal position.

The latest cutting edge technology using the conoscopic system or CAD/CAM system also involves in fabrication of dental prostheses like crowns & bridges and dental veneers. By combining high-precision scanning technology, intuitive design software and industrial manufacturing machines, excellent high quality metal-free dental prostheses can be produced to meet the demand of esthetic and strength for masticatory function. The working processes can be achieved within a few minutes after scanning the master dental models or impressions that minimise the complicated laboratory procedures in the conventional way.

In conjunction with cone-beam CT scans and software, high-quality 3-D images of dento-maxillofacial structures can be reproduced for patients within minutes of imaging. This technology is especially useful in the diagnosis of dental pathology, risk assessment in oral surgery and dental implant treatment planning. The technology is also applicable in the fields of periodontics and endodontics for bone loss assessment and treatment of complicated root canal morphology.

The developed computerised database technology also relieves the problems of limited storage space for patients' records in the dental office. Apart from recording the treatment records and radiographic films in a digitalised format, dental study models and casts that occupy a lot of office space can now be stored in a database form. By using the scanning system and software, all plaster dental casts can be converted to 3-D virtual study models on the computer. Hence a paperless and plasterless dental practice is now possible with the application of this technology.

Digital Dentistry is now becoming a reality and has changed the facets of practising dentistry in modern days. It is also a subject for study and development for all dentists in the years to come.