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Guest Editorial

Digital dentistry: Current concepts and future prospects

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1. Introduction

Digitalization of dentistry has brought about the Golden Age of Dentistry because of the revolutionary changes it has brought in the way dentist view their field of work. It has brought about an ease in diagnosis, treatment planning, treatment execution and dental research that is unparalleled. Digital dentistry makes the long-winding path from patient's 1^{st} visit to the final visit with their treatment completion a much easier journey for both the dentist and the patient. Although "digital dentistry" has been around since the tail end of the 20^{th} century, it has only been brought into mainstream clinical practice since the last two to three decades.

The introduction of digital technologies has helped dentists in their endeavour to guarantee their patients the best achievable and most comfortable treatment experience. Despite the challenges of cost and availability, it has seen an exponential rise in popularity because of its ability to bring a paradigm shift in the way we view dental treatment. It has advantages such as saving time, accuracy and precision, enhanced aesthetics, reduction of human error, less wastage of materials, patient comfort, universalized record keeping, easy communication with dental laboratory etc. The quality of care has reached new heights through improved diagnosis and treatment planning. Digital dentistry allows clinicians to offer contemporary solutions for the traditional dental conundrums.[1]

Application of digital technology in the field of dentistry is wide and varied. It covers all aspects of the dental sphere including clinical dentistry, dental research, dental laboratories and even dental student training.

2. Patient Record-Keeping

Digital options in clinical dentistry include options for patient records, diagnosis, treatment planning as well as actual clinical procedures. Numerous digital softwares are available for keeping the patient records which provide the advantages of reduction in resource utilization as well as easy transfer. Optical impressions are another gift that digital technology has bestowed on dental clinicians. It elevates precision and accuracy of the impression, visualization of tooth preparations in all perspective as well as instant feedback for the dental technician if necessary.[2]

3. Diagnosis

A successful treatment begins with a thorough and precise diagnosis. In the gamut of digital diagnostic tools available to dentists, digital radiography, especially Cone-Beam Computed Tomography (CBCT) plays an incomparable role in understanding the patient's profile. It allows clinicians to avoid any pitfalls they might come across during the treatment phase by providing a 3-dimensional view of the patient's bone morphology, thus, leading to better prognosis. For prosthodontists, it plays an inseparable role in the

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treatment planning for implant placement.[2]

4. Treatment Planning

In terms of treatment planning, Computer-Aided Designing and Computer-Aided Milling (CAD-CAM) brought a revolutionary change to the dental world in the 1980s. All CAD/CAM systems comprise of 3 digitally controlled functional components for data acquisition, restoration and design production. CAD CAM can be used for fabrication of different prosthesis such as inlays, onlays, conventional full coverage crowns, veneers, fixed partial dentures, implant abutments, implant crowns, surgical guides, complete dentures and even maxillofacial prostheses. Although initially CAD CAM technology was only based on a "subtractive manufacturing" process, recent advancements has made "additive manufacturing" from a theory to a possibility. It has allowed rapid prototyping and laser sintering technology to be used for fabrication of not just simple prosthesis such as crowns and fixed partial dentures but even comprehensive full mouth designs such as complete dentures and surgical template for full arch implant rehabilitation. It has enhanced the prosthesis fabrication process to an unbelievable level of accuracy and precision of fit and placement.[3]

With the advent of virtual facebows and articulators, it has made full mouth rehabilitation a much more accurate and predictable process with accurate recording of the temporomandibular joint relations helping technicians and clinicians to provide a much more enhanced occlusion to the patient. It has made aesthetic cases of smile designing a much faster process through state-of-the-art videography and technology with the added benefit of immediate modification based on patient's feedback and desires.[3]

5. Clinical Procedures and Techniques

When it comes to actual clinical procedures, digital technology plays an important role in implant dentistry especially. Newer technological advances have made real time CBCT and dynamic navigations from an impossibility to a reality. It allows implantologists to have an excellent level of accuracy during implant placement with very little room for error or mishaps. It has made a game of dexterous skill and chance to a game of predictable outcome and sure-fire success.[4]

Thus, we can see, that if dentists are able to shed their age-old habituation with traditional technique, they can wield the digital tools available to them to provide better care for their patients with much more ease and precision.

6. Conflict of Interest

None.

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