Artificial Intelligence: Reinventing Dentistry

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Dear Editor,

We would like to highlight the growing significance of Artificial Intelligence in dentistry through your esteemed journal. Artificial Intelligence (AI) is the theory and development of computer systems that are able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, and decision-making. With the advent of digital dentistry, AI is making substantial advancements in establishing an accurate diagnosis, comprehensive treatment plans, and assessment of prognosis, ultimately reducing or removing subjectivity and human error in every step[1].

AI tools support dental surgeons by streamlining tasks, enhancing infection control, and delivering precise, high-quality care. Radiology stands as the primary domain for AI implementation, translating digitally encoded images into computer language. In 2D and 3D radiographs, it efficiently provides image enhancement, annotation of anatomic landmarks, crown preparation analysis, smile designing, working length determination, and detection of various lesions, malignancies of the oral and maxillofacial region, periapical and periodontal pathologies, and odontogenic infections[2]. Moreover, it contributes to endodontics by detecting the normal variations in root canal configurations, apical foramen location, and subtle variations that might be overlooked by human interpretation of dental radiographs[3].

In prosthodontics, AI applies to CAD/CAM systems and implant-supported prostheses in determining bone levels for implant placement, analyzing the prognosis of implants, matching the shade of artificial teeth in dentures, and processing 3D models of molds for restorations. By allowing for an accurate assessment of tooth color and increasing the precision of dental restorations, these developments can help cosmetic dentistry. If we look into the field of orthodontics, AI helps in clinical decision-making[4]. Dental Monitoring is an AI-based orthodontic monitoring service that enables patients to use their smart phones to scan their teeth, which provides remote treatment monitoring. Furthermore, AI significantly contributes to assessing and predicting the treatment outcome of malocclusions beforehand, which can be used to counsel patients to have a more positive response to such a long treatment process[5].

All in all, diagnostic and prognostic forecasting using AI could change the standard of care in the same way that medical imaging has altered how clinicians observe anatomy and pathology. The prospect of artificial intelligence in dentistry seems very promising, as it reduces everyday trial and error and improves the treatment process and outcome for clinicians and patients.

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