



Editorial

Role of Artificial Intelligence in Oral Diagnosis and Dental Treatment

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Artificial intelligence (AI), among other areas, has already had a substantial impact on the healthcare industry. AI has the potential to fundamentally alter how dentists diagnose and treat patients, and dentistry is no exception.¹ There is growing concern that several medical specialists, including several dentistry disciplines including oral radiology, oral pathology, and orthodontics, may become extinct as AI technology advances.² In this post, we will look at how AI is changing dentistry and how that can affect these subspecialties.

Although the application of AI in dentistry is still in its infancy, it has the potential to significantly enhance patient outcomes. The interpretation of radiographic images is one of the most prominent fields where AI is having an influence. Dental diagnosis and treatment planning depend heavily on radiographic images, but their interpretation can be labor-intensive and arbitrary. Large volumes of data can be promptly and correctly analyzed by AI algorithms, leading to more accurate and reliable diagnoses. Regarding the interpretation of radiographs, computed tomography (CT) scans, and other imaging studies of the mouth and adjacent regions, oral radiology is a specialized specialty of dentistry. In the past, years of specialized training and expertise were needed for the interpretation of these research. But with the development of AI technologies, it is possible that the demand for future medical professionals in this area may decline. Large datasets can be analyzed by AI algorithms, which can also spot patterns that are invisible to the naked eye. In the field of oral radiology, AI can help in spotting anomalies or potentially dangerous locations in radiographs, CT scans, and other imaging studies.³ In the case of oral

cancer, for instance, AI may be able to identify tiny lesions that are not always evident on conventional radiographs, enabling early diagnosis and treatment.

Radiographs may be examined using AI technology to find signs of periodontitis, tooth decay, and other dental issues. AI is able to identify patterns in radiographic pictures that are related to certain diseases or situations by utilizing machine learning techniques. With the use of this technology, dentists may be able to diagnose and treat dental issues more precisely and effectively.

General dentists may be able to interpret radiographic pictures using AI tools as the technology develops and becomes more widely used, eliminating the need for specialized training in oral radiology. Due to this, there may be less of a need for specialists in this area, which might change the focus of dental education and training.

Oral radiology is a sector where AI technology is anticipated to have a substantial influence. AI has the potential to enhance patient outcomes and lessen the need for invasive treatments by offering more precise and effective diagnosis. The widespread use of AI technology, however, could potentially have an impact on how the area of oral radiology develops in the future.

Oral pathology has already seen considerable advancements in AI. AI systems may identify patterns and abnormalities that may not be visible to the human eye by analyzing enormous volumes of data. A variety of disorders, such as oral cancer, periodontitis, and other inflammatory problems, can be diagnosed with the use of this technique.⁴ AI may also help in spotting prospective problem areas that could have been overlooked by human interpretation.

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For instance, AI has already shown the ability to increase diagnostic precision in the diagnosis of oral cancer. AI systems are able to recognize patterns that are suggestive of cancer with high sensitivity and specificity by examining vast databases of histopathology images. This may result in early cancer identification and maybe better patient outcomes. It is possible to create personalized machine learning workflows with a relatively small investment, which can greatly enhance the early detection of oral lesions, ultimately leading to improved patient prognosis.⁵

AI has important potential effects for oral pathology. AI algorithms may be able to identify anomalies or possible areas of concern in histology pictures more precisely and quickly than human interpretation as they grow more advanced and common. The demand for oral pathologists could decline as a result, if the technology becomes more widely available and more reasonably priced. AI endeavors to bring together the expertise of oral pathologists, oral medicines, head and neck surgeons, and computer scientists, with a focus on advancing the creation and adoption of novel machine learning-based image techniques for the diagnosis of head and neck cancer.⁴

While AI would not totally replace oral pathologists, it could lessen the need for these professionals. Without specialized training in oral pathology, ordinary pathologists may be able to analyze histopathological pictures using AI technologies as AI algorithms grow more precise and effective. This may cause the emphasis of medical education and training to change, putting more of an emphasis on the use of AI technology in patient diagnosis and care.

Oral pathology is a sector where AI technology is projected to have a substantial influence. AI has the potential to enhance patient outcomes and lessen the need for invasive treatments by offering more precise and effective diagnosis. The extensive use of AI technology, however, could potentially have an impact on how the discipline of oral pathology develops in the future.

It may be possible for general pathologists to analyze histopathological images using AI tools as AI algorithms advance, eliminating the need for specialized training in oral pathology. It may also be possible for the need for specialized training in oral radiology to diminish, potentially reducing the demand for specialists in these fields. This may cause the emphasis of dental education and training to change, placing more of an emphasis on the use of AI technology in patient diagnosis and care.

Even though there are a lot of potential advantages for AI in dentistry, some specialties may be affected adversely. For instance, if AI technology develops, oral radiology could become obsolete. AI systems may be able to analyze radiographic pictures more precisely and quickly than human interpretation as they advance in sophistication. As the technology becomes more widely used and available, this may lessen the need for oral radiologists.

Similar to how it may affect other fields, oral pathology may be affected by AI. As AI algorithms advance, they may be able to identify anomalies or possible areas of concern more precisely and quickly in histology pictures than

human interpretation. Due to the growth and accessibility of the technology, there may be less need for oral pathologists.

Another field that AI may affect is orthodontics.^{6,7} As AI technology develops, dental practitioners may be able to create customized treatment plans using AI algorithms without having to undergo lengthy orthodontic training. With more people having access to the technology, there may be less of a need for orthodontists.

Despite the potential importance of AI in dentistry, it is crucial to remember that AI cannot take the place of human skill. Even as AI technology develops, dental professionals will remain essential in the diagnosis and treatment of patients. AI could be considered as a tool to help with decision-making instead, offering extra data and analysis to help with diagnosis and treatment planning.

Additionally, the dentistry business may be significantly impacted by the use of AI technology. As AI algorithms are increasingly extensively used, it could be feasible to create dental treatments that are more precise and effective, lowering the need for invasive procedures and enhancing patient outcomes. This may cause the emphasis of dental education and training to change, placing more emphasis on the use of AI technology in patient diagnosis and treatment.

To conclude, the development of AI technology in dentistry has the potential to significantly enhance patient outcomes and transform how dental practitioners conduct patient diagnosis and treatment. Concerns exist, nevertheless, regarding the possible effects on some specialties.

Authors' Contributions

MD and ZKS designed this research. MD, SG, and ZKS drafted the manuscript. All authors read, approved, and contributed to the manuscript preparation.

Ethical Responsibilities of Authors

The manuscript has not been submitted to more than one journal for consideration. The manuscript has not been published previously (partly or in full) unless the new work concerns an expansion of previous work; there is no transparency on the reuse of material to avoid the hint of text-recycling ("self-plagiarism").

Consent Form

For this type of study, informed consent was not applicable.

Statement of Human and Animal Rights

For this type of study, statement of human and animal rights was not applicable.

Ethical Approval

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Conflict of Interests

None declared.

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