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Editorial

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Artificial Intelligence in Dental Imaging, Cone Beam CT and Diagnostic Accuracy

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Introduction

Dental imaging is fundamental to accurate diagnosis, treatment planning, and monitoring of oral and maxillofacial conditions. Cone beam computed tomography (CBCT) has become an essential imaging modality in modern dentistry, providing three-dimensional visualization of teeth, bone, and surrounding anatomical structures. Despite its advantages, interpretation of CBCT images can be complex and time-consuming, with diagnostic accuracy influenced by clinician experience. The integration of artificial intelligence (AI) into dental imaging has emerged as a promising solution to enhance image interpretation, improve diagnostic accuracy, and support clinical decision-making [1,2].

Discussion

CBCT imaging offers detailed three-dimensional information that is invaluable in implant planning, endodontics, orthodontics, and oral surgery. However, the large volume of data generated by CBCT scans increases the risk of missed findings, especially subtle pathologies. AI, particularly machine learning and deep learning algorithms, can analyze CBCT datasets efficiently and consistently. These systems are trained on large image databases to recognize patterns associated with anatomical landmarks, pathological changes, and treatment outcomes [3,4].

AI-driven tools assist clinicians by automatically detecting conditions such as periapical lesions, impacted teeth, root fractures, bone defects, and temporomandibular joint abnormalities. By highlighting areas of concern, AI reduces diagnostic oversight and supports earlier detection of disease. This enhancement in diagnostic accuracy leads to improved treatment planning and patient outcomes. AI also standardizes image interpretation, minimizing variability between clinicians and supporting less experienced practitioners [5].

In implant dentistry and orthodontics, AI-assisted CBCT analysis improves precision by accurately mapping bone quality, nerve location, and spatial relationships. In endodontics, AI helps identify complex root canal anatomy and periapical pathology that may be difficult to detect on conventional imaging. Furthermore, AI algorithms can quantify bone density and monitor changes over time, supporting outcome assessment and long-term follow-up.

Despite these benefits, challenges remain in integrating AI into routine clinical practice. Algorithm accuracy depends on the quality and diversity of training data, and ethical considerations such as data privacy and transparency must be addressed. AI is intended to augment, not replace, clinical judgment, emphasizing the importance of clinician oversight.

Conclusion

The application of artificial intelligence in dental imaging, particularly in CBCT interpretation, represents a significant advancement in diagnostic dentistry. By enhancing diagnostic accuracy, efficiency, and consistency, AI supports better clinical decision-making and patient care. As technology continues to evolve and regulatory frameworks mature, AI-assisted dental imaging is expected to become an integral component of modern dental practice, complementing clinician expertise and improving diagnostic outcomes.

References

1. Von-Seidlein L, Kim DR, Ali M, Lee HH, Wang X, Thiem VD, et al. (2006) A multicentre study of Shigella diarrhoea in six Asian countries: Disease burden, clinical manifestations, and microbiology. PLoS Med 3: e353.
2. Germani Y, Sansonetti PJ (2006) The genus Shigella. The prokaryotes In: Proteobacteria: Gamma Subclass Berlin: Springer 6: 99-122.
3. Aggarwal P, Uppal B, Ghosh R, Krishna Prakash S, Chakravarti A, et al. (2016) Multi drug resistance and extended spectrum beta lactamases in clinical isolates of Shigella: a study from New Delhi, India. Travel Med Infect Dis 14: 407–413.
4. Taneja N, Mewara A (2016) Shigellosis: epidemiology in India. Indian J Med Res 143: 565-576.
5. Farshad S, Sheikhi R, Japoni A, Basiri E, Alborzi A (2006) Characterizationof Shigella strains in Iran by plasmid profile analysis and PCR amplification of ipa genes. J Clin Microbiol 44: 2879–2883.