AI-BASED PREDICTION OF ENDODONTIC TREATMENT OUTCOMES

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ABSTRACT

Endodontic prognosis has always traditionally been the realm of clinical judgment, radiographic assessment, and patient-related information, which are limited in their accuracy and consistency. But now, with recent advances in AI, several brand-new predictive models have been developed that merge large, complex dataset to provide increased accuracy in prognosis. Machine learning and deep learning algorithms are capable of analyzing clinical data records, periapical radiographs, and CBCT images to identify subtle patterns suggestive of success or failure of treatment. AI-empowered models provide clinicians with evidence-based support in making the final decision: whether they are treatment plans or patient communications or long-term prognosis. However, challenges exist, beginning with the limited availability of annotated datasets, followed by the desire for model interpretability, and the prospects of external validation across disparate populations. Despite all these barriers, though, prediction systems created using AI methods are immensely capable of revolutionizing endodontic prognosis, paving toward personalized, data-driven dental care.

KEYWORDS: *Artificial Intelligence, Endodontics, Machine Learning, Deep Learning, Treatment Outcomes, Prognosis, Decision Support, Predictive Models, Root Canal Therapy, Clinical Applications*