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Letter to the Editor

Letter to the editor regarding “Diagnosis of cracked tooth: Clinical status and research progress”



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I recently had the opportunity to read a very informative paper entitled “Diagnosis of cracked tooth: Clinical status and research progress” [1]. It addresses a common problem in the dental office, the diagnosis of cracked tooth syndrome. It is duly noted that the ambiguous symptoms make definitive diagnosis difficult and result in delay or failure of appropriate therapy. Therefore, it is imperative for a doctor to know the different methods to properly diagnose a cracked tooth and conduct appropriate and timely treatment.

The author dwells in detail on the various methods of diagnosing cracked teeth. Each of these methods has been described in detail and will be very helpful to all readers. However, I feel that the article neglected to address the computer-aided technique for diagnosis. Computers mimic intelligent behavior with minimal human interaction, known as artificial intelligence (AI) [2]. AI systems have been compared to the human brain, where each computing element is called a neuron and forms connections, or synapses. This complete architecture has proven beneficial in diagnosing complex longitudinal fractures, particularly vertical root fractures and cracked tooth syndrome.

Treatments or image-based detection algorithms have been developed to enable error-free diagnosis. Three approaches to AI have been listed. The first is the convolutional neural network-based crack detection approach, where image classification, object detection, and semantic segmentation are discussed in detail. More specifically, algorithms based on image classification (Alexnet) treat the crack detection problem as if it were a binary classification problem. However, its efficiency is slightly limited. Another technique is object recognition-based methods (YOLO, Faster R-CNN), in which they immediately give information about the position and size of the targets of interest with a marked bounding box in the image. And finally, the third pixel-level crack segmentation algorithms (Unet, Segnet, CrackSeg) are a promising technique for crack detection as

they extract detailed information and more specific properties such as crack path, position, length, width and density [3]. Zhang et al. developed an image-based method to detect the microcrack in tooth and found the method both rapid and helpful [4].

Therefore, in my opinion, an updated overview of cracked tooth diagnosis should explain the applications of machine learning in the diagnosis of tooth cracks. As AI-driven technologies are promising methods to increase productivity and improve the accuracy and precision of cracked tooth syndrome diagnosis and treatment. And it's fair to say that this technology will continue to expand and become much more powerful in the not too distant future [5].

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Ethical statement

The research work was carried out after institutions ethical consent.

Conflict of interest

None.

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Abbreviations: AI, Artificial intelligence

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