Journal of Orthopedics Research and Rehabilitation

Letter to the Editor

DOI: 10.51271/JORR-0061

Letter to the editor: comment on “Artificial Intelligence in fracture detection: is it time to redefine the role of the orthopedic surgeon?”

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Cite this article as: Baki H. Letter to the editor: comment on “Artificial Intelligence in fracture detection: is it time to redefine the role of the orthopedic surgeon?” *J Orthop Res Rehabil.* 2025;3(4):103-104.

Received: 02.06.2025 ◆ **Accepted**: 11.10.2025 ◆ **Published**: 22.10.2025

Dear Editor,

The integration of Artificial Intelligence (AI) into musculoskeletal imaging has advanced rapidly in recent years. Among its most notable applications is the detection of bone fractures on plain radiographs and computed tomography (CT) scans. This technological shift invites a critical question; should the role of the orthopedic surgeon be redefined in the era of AI-supported diagnosis?

Recent studies confirm that deep learning algorithms can detect fractures with an accuracy comparable to human experts. A comprehensive meta-analysis by Kuo et al.[1] analyzed over 55,000 radiographic images and reported pooled sensitivities and specificities exceeding 90% for both AI models and human readers. Similarly, a systematic review evaluating commercial AI tools demonstrated high sensitivity across platforms, particularly when used in tandem with clinical oversight.[2]

AI’s added value becomes most apparent in challenging or subtle cases. For instance, Liu et al.[3] showed that an optimized AI system significantly outperformed radiologists in identifying subtle avulsion fractures on CT scans. This diagnostic enhancement is not limited to imaging experts. Meetschen et al.[4] demonstrated that AI assistance improved fracture detection sensitivity among radiology residents from 58% to 77%, without compromising specificity or increasing reading time. Likewise, Bachmann et al.[5] found that non-specialist readers benefited significantly from AI support, with notable reductions in both missed diagnoses and false positives.

Despite these advances, current evidence does not suggest that AI can or should replace orthopedic surgeons. The most consistent finding across multiple studies is that diagnostic performance is optimized when AI is used as a complement-not a substitute-for human expertise. While AI may flag fractures efficiently, clinical management requires the integration of imaging results with physical examination findings, patient history, and surgical acumen-areas in which AI still lacks capacity.

From an educational standpoint, AI also holds promise as a training tool for residents and junior clinicians, helping to calibrate diagnostic accuracy and confidence. However, over-reliance on algorithmic outputs without clinical correlation may pose new risks, particularly in ambiguous or atypical presentations.

In conclusion, AI has demonstrated remarkable accuracy in fracture detection and shows significant potential as an adjunctive tool in orthopedic practice. Yet, the human clinician remains central to the diagnostic and therapeutic pathway. Rather than redefine the surgeon’s role, the focus should be on strategic integration of AI to enhance, not diminish, clinical judgment. As evidence continues to accumulate, the orthopedic community must guide the ethical and practical deployment of AI to ensure patient-centered outcomes remain paramount.

Keywords: Artificial Intelligence, fracture detection, orthopedic surgery

ETHICAL DECLARATIONS

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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