LETTER TO THE EDITOR

Artificial Intelligence and the State of the Art of Orthopedic Surgery

Dear Editor

I read with great interest the comprehensive review by Khojastehnezhad et al., entitled "Artificial Intelligence and the State of the Art of Orthopedic Surgery," published in the January 2025 issue of your journal (ABJS 2025;13(1):17-22).[1] As a practicing orthopedic surgeon who is actively involved in research, I would like to commend the authors for their timely and insightful analysis of AI applications in our field, while also offering a few additional perspectives.

The authors appropriately underscore the transformative potential of AI in enhancing diagnostic accuracy and surgical planning.[2] However, I believe that several critical considerations warrant further discussion. First, the implementation barriers faced by community hospitals compared with academic centers merit closer examination. While the review rightly emphasizes technical challenges such as data standardization and algorithmic transparency, disparities in institutional resources may foster a two-tiered system of care that could further exacerbate existing healthcare inequities.

Second, with regard to AI-assisted surgical procedures, I would like to underscore the importance of preserving surgical skills independent of technological support. While the authors rightly point out that AI technologies are intended to augment rather than replace clinical expertise, it remains essential that training programs continue to prioritize the mastery of fundamental surgical techniques. Excessive reliance on AI assistance could, over time, diminish the tactile feedback and intuitive decision-making that are hallmarks of expert surgical practice.

Additionally, the medicolegal implications of AI-assisted decision-making warrant urgent consideration. When an AI system recommends a treatment plan that diverges from established clinical judgment, the attribution of liability becomes increasingly complex. This concern is particularly salient in orthopedic surgery, where patient outcomes may vary substantially due to individual anatomical differences and comorbidities that AI models may not adequately capture.

Finally, I propose that future research should prioritize prospective randomized controlled trials comparing AI-assisted approaches with conventional techniques in specific procedures. Although the authors highlight potential benefits such as improved accuracy and reduced operative times, robust clinical evidence across diverse patient populations remains essential before these technologies can be adopted on a widespread basis.

The integration of AI into orthopedic surgery is indeed both inevitable and potentially transformative. However, as these technologies are adopted, it is imperative to balance innovation with the preservation of clinical expertise, ensure equitable access across healthcare settings, and establish clear regulatory frameworks.[3] I commend the authors for initiating this important dialogue and look forward to further discussion within our community.

Sincerely,

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