



EDITORIAL

Dear Colleagues,

In recent years, artificial intelligence (AI) has emerged as a transformative force in the field of medicine, and spinal surgery is no exception. The integration of AI into spinal surgery promises enhanced precision, efficiency, and patient outcomes, making it an indispensable tool for surgeons navigating complex spinal pathologies. As the Journal of Turkish Spinal Surgery continues to highlight advancements in the field, it is essential to explore the profound impact AI is having on the way spinal disorders are diagnosed and treated. One of the most significant contributions of AI to spinal surgery is its ability to assist in preoperative planning. Machine learning algorithms, a subset of AI, can analyze patient data, including imaging studies such as magnetic resonance imaging and computed tomography scans, to identify subtle abnormalities and patterns that might be missed by the human eye. These algorithms not only help in diagnosing conditions like spinal stenosis, herniated discs, or deformities but also provide surgeons with detailed 3D reconstructions of the spine. This level of accuracy ensures that surgical interventions are meticulously planned, reducing the likelihood of complications and improving outcomes. Intraoperatively, AI-powered robotic systems are transforming the surgical landscape. Robotic platforms, guided by AI algorithms, allow for unparalleled precision in spinal instrumentation, particularly in pedicle screw placement. This level of accuracy minimizes the risk of nerve injury and ensures optimal spinal alignment. Furthermore, AI-driven navigation systems provide real-time feedback during surgery, enabling surgeons to make informed decisions and adapt to intraoperative challenges. This fusion of human expertise and machine efficiency is setting new benchmarks for safety and effectiveness in spinal surgery. Beyond the operating room, AI is also revolutionizing postoperative care and rehabilitation. Advanced algorithms can monitor patients' recovery through wearable devices, providing real-time data on mobility, pain levels, and other key metrics. This data-driven approach allows for personalized rehabilitation plans, ensuring that each patient receives care tailored to their specific needs. Additionally, predictive analytics powered by AI can identify patients at risk of complications, enabling early intervention and reducing hospital readmissions. Despite these remarkable advancements, the integration of AI into spinal surgery is not without challenges. Issues such as data privacy, algorithm transparency, and the need for rigorous validation must be addressed to ensure the safe and ethical use of AI. Moreover, surgeons must strike a balance between embracing technology and maintaining their clinical acumen, as the human element remains irreplaceable in patient care. In conclusion, AI is poised to redefine the field of spinal surgery. By enhancing diagnostic accuracy, surgical precision, and postoperative care, AI is empowering surgeons to achieve better outcomes for their patients. As researchers and clinicians in Türkiye and across the globe continue to explore the potential of AI, the future of spinal surgery looks brighter than ever.

The Journal of Turkish Spinal Surgery, as a leading platform for innovation and knowledge dissemination, plays a crucial role in documenting and shaping this transformative journey. Together, we can harness the power of AI to advance spinal health and improve the quality of life for countless individuals. As AI becomes more and more involved in spine surgery, we are pleased to see frequent articles related to AI in our journal.

Co-Editor-in-Chief

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