

THE CONSOLIDATION OF ENDOSCOPIC SPINE SURGERY

A CONSOLIDAÇÃO DA ENDOSCOPIA DA COLUNA VERTEBRAL

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It is with great satisfaction that we present this special issue of *Revista Columna*, entirely dedicated to endoscopic spine surgery. Until recently, this technique was often considered limited to highly selected indications, particularly lumbar discectomy in favorable cases. However, the current landscape has changed substantially. Endoscopic spine surgery has evolved from a peripheral technique to an integral component of contemporary discussions on neural decompression, tissue preservation, early rehabilitation, and biomechanical optimization of surgical approaches.

The progress observed over the past decade has been significant.¹ Advances in endoscopic equipment, specialized instrumentation, energy sources, irrigation systems, and fluoroscopic guidance, combined with a deeper understanding of three-dimensional spinal anatomy under endoscopic visualization, have considerably expanded the scope of the technique. Indications that were once largely restricted to lumbar disc herniation now include revision procedures, adjacent segment disease, thoracic pathology, cauda equina syndrome, synovial cysts, and cervical approaches. Increasingly, endoscopic techniques are also being applied to more complex scenarios, including separation surgery, selected tumor resections, and procedures in patients with high clinical risk. This expansion reflects not only technological progress but also greater technical maturity, improved patient selection, and a growing body of scientific evidence.^{2,3}

At the same time, the increasing adoption of endoscopic techniques requires proportional responsibility. Endoscopic spine surgery should not be viewed simply as a miniaturized form of open surgery or as a low-complexity procedure. On the contrary, it requires a substantial learning curve, advanced anatomical understanding, precise surgical planning, and effective management of complications.⁴ In many situations, the smaller working corridor demands greater intraoperative decision-making. Modern endoscopic spine surgeons must understand not only the instrumental pathway but also the principles of irrigation dynamics, the limits of bony decompression, neural behavior under magnified visualization, and the potential impact of critical structures, including vascular structures, particularly in regions such as the thoracic spine. Consequently, the continued expansion of endoscopic spine surgery must remain

closely linked to rigorous training, structured learning pathways, and the generation of high-quality scientific evidence.

The studies presented in this issue reflect this evolving stage of endoscopic spine surgery. They demonstrate both the consolidation of the technique in established indications and its application in clinical scenarios previously considered unlikely. These include the treatment of complex spinal disorders with effective neural decompression, reduced tissue disruption, lower morbidity, and accelerated functional recovery. At the same time, this issue highlights an equally important development: endoscopy is no longer merely an access route but increasingly represents a surgical platform. Beyond enabling disc removal or foraminal enlargement, endoscopic techniques allow surgeons to revisit established concepts, challenge traditional assumptions, and approach spinal pathologies that previously required extensive surgical exposure.

This transition naturally raises the question of the next stage in the evolution of endoscopic spine surgery. As the field moves beyond demonstrating feasibility, the focus increasingly shifts toward identifying where endoscopic approaches provide the greatest biological, functional, and economic value for patients. Future developments will likely involve greater integration with surgical navigation, robotics, artificial intelligence, advanced neuromonitoring, and biologic therapies. In addition, further technical standardization, improved case stratification, refinement of thoracic and cervical indications, expansion of minimally invasive spinal oncology, and incorporation of regenerative strategies may shape the next phase of the field. The central question may no longer be whether endoscopic spine surgery will have a role, but rather how it can be refined to ensure safe, sustainable, and scientifically grounded growth.

This special issue therefore aims to document an important moment in the evolution of the field. Endoscopic spine surgery is no longer an emerging concept—it is an established reality. Nevertheless, continued progress will depend on critical evaluation, academic rigor, and ongoing innovation. The contributions included in this issue aim not only to present the current state of the technique but also to stimulate further discussion and development within the spine surgery community.



CONFLICT OF INTEREST

The author declare no potential conflict of interest related to this article.

CONTRIBUTIONS OF THE AUTHORS

The author contributed individually and significantly to the development of this article. JPMB: Conceptualization, writing, and editing.

DATA AVAILABILITY DECLARATION

The contents underlying the research are available in the manuscript.

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