


Commentary



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Research Productivity of Scientific
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Decompression Spine Surgery:
Quantitative and Qualitative
Analysis” via
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Commentary on “A 30-year Worldwide Research Productivity of Scientific Publication in Full- endoscopic Decompression Spine Surgery: Quantitative and Qualitative Analysis”

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Full-endoscopic decompression spine surgery (FEDS) has evolved significantly in recent years, revolutionizing the field of minimally invasive spine surgery. FEDS offers advantages over open spine surgery, including faster recovery, reduced hospital stays, and decreased the complication incidence.¹ During coronavirus disease 2019, it reduces infection risk and hospital burden by minimizing stays and freeing up resources. Since FEDS is an innovative, evolving and attractive minimally invasive technique for spinal surgery, the number of articles published on FEDS has increased in recent decades, making it difficult to identify high-impact papers, which may be a perplexing and time-consuming task.

Based on these perspectives, the authors reported a bibliometric study² that analyzed research publications related to FEDS between 1992 and 2022 using Bibliometrix, CiteSpace, and VOSviewer. The study found that *Spine* was the most cited journal in the field of FEDS and had the highest H-index.² China was the most productive country, and South Korea had the most cited papers with high H-index. The most impactful authors in global and local citations were Yeung AT, Ruetten S, Hoogland T, Ahn Y, Choi G, and Mayer HM, and the most productive organization was Wooridul Spine Hospital. Despite the growing trend of research on FEDS, the quality of studies in this field is still low. This is due to a lack of high-quality clinical evidence and a trend of general journal submissions, which have had a negative impact on the quality of endoscopy journals in recent years.

FEDS has a relatively short history compared to traditional open spinal surgeries. The first documented attempt at endoscopic spinal surgery was in the 1970s by a German neurosurgeon, Dr. Parviz Kambin. He is credited with developing the percutaneous posterolateral approach for accessing the disc space and removing disc material through a minimally invasive technique using a cannula.³ This technique was a significant advance in spinal surgery and paved the way for the development of endoscopic spine surgery, including the en-

doscopy transforaminal approach. Dr. May HM first demonstrated percutaneous endoscopic lumbar discectomy in Germany in 1987 for the removal of a contained lumbar disc herniation via a percutaneous posterolateral approach.⁴ The 1990s saw the development of several other endoscopic spinal surgery techniques, including the transforaminal approach, which involves accessing the spinal canal through a small opening in the side of the spine. The Yeung endoscopic spine system (YESS) was described by Dr. Yeung AT in a 1999 publication.⁵ In the YESS technique, the working cannula is inserted into the intervertebral disc through the Kambin triangle. Then, the surgeon performs discectomy and decompression by working inside the intervertebral disc towards the spinal canal. Different from the primary surgical scope limited to the intervertebral disc, Dr. Ahn Y and Dr. Choi G demonstrated an evolved epidurally oriented transforaminal endoscopic approach to directly remove herniated disc fragments.^{6,7} Dr. Hoogland T developed a “outside-in” transforaminal endoscopic approach and a foraminoplasty technique, using a trephine to resect part of the superior articular process to provide adequate space for removal of herniated disc.⁸ Dr. Ruetten S developed the interlaminar technique to overcome lumbar disc herniation at the L5/S1 level of the high iliac crest.⁹ The full-endoscopic interlaminar technique is now widely used for the treatment of spinal stenosis, herniated discs, and other spinal conditions. They continuously develop new surgical techniques and instruments, have published numerous research papers and several books on endoscopic spinal surgery, and hold seminars and training courses in many countries around the world. Collectively, the contributions of Yeung AT, Ruetten S, Hoogland T, Ahn Y, Choi G, and Mayer HM to endoscopic spine surgery have to advance the field and have a significant impact on spinal surgery around the world. Their work has led to the development of new techniques and instruments that improve patient outcomes, and increase awareness and adoption of this minimally invasive surgical approach.

South Korea has made significant contributions to the field of endoscopic spine surgery is accurate and well-supported. In recent years, researchers from South Korea have produced a large number of high-quality studies on endoscopic spine surgery that have been published in top-tier medical journals and have received high citation counts and H-indices. This success in endoscopic spine surgery research can be attributed to a variety of factors, including the country's advanced healthcare system and medical infrastructure, its strong research culture, and the availability of skilled and experienced medical professionals. In South Korea, Wooridul Spine Hospital has played a sig-

nificant role in the field of endoscopic spine surgery. It is considered as one of the leading institutions in the world for endoscopic spine surgery. The hospital has a dedicated research department that focuses on developing new techniques and technologies in endoscopic spine surgery. It has produced a significant number of high-quality research papers on endoscopic spine surgery, contributing to the knowledge and advancement of the field. These papers have received high citation counts and H-indices, indicating their impact and influence on the field. Therefore, the combination of South Korea's strong research culture, advanced healthcare system, and institutions like Wooridul Spine Hospital has made a significant contribution to the field of endoscopic spine surgery. The country's focus on innovation and commitment to patient care has helped to improve patient outcomes and establish South Korea as a leading contributor to the field of minimally invasive spine surgery.

The study² also found that the number of endoscopic spine surgery articles published in China increased dramatically over the course of the decade, reflecting the country's growing investment in research and development in this field. Other countries, such as the United States, South Korea, and Germany, also made significant contributions to the field during this period, but China was the clear leader in terms of article output. The success of China in endoscopic spine surgery research can be attributed to its large population, advanced healthcare system, and significant investment in medical research and development. Chinese researchers have been actively developing and refining innovative endoscopic techniques and technologies, contributing to the advancement of the field. It is worth noting, however, that the number of articles published does not necessarily reflect the quality or impact of the research being conducted. Furthermore, it is important to consider factors such as funding, collaboration, and access to resources when evaluating a country's overall contribution to a particular field. Nevertheless, China's emergence as a major contributor to the field of endoscopic spine surgery is a noteworthy development and highlights the increasing global interest in this minimally invasive technique.

In this study,² the authors conducted a bibliometric analysis of FEDS to assess research productivity, identify key researchers and institutions, and track research trends. While the number of endoscopic spine surgery studies published has increased over time, the quality of these studies is still an area of concern. Conducting high-quality studies such as meta-analyses, prospective comparable studies, or randomized controlled trials is essential to establish the safety and efficacy of endoscopic spine surgery techniques and to develop standard healthcare guidelines. The

availability of high-quality clinical evidence can guide clinical decision-making and improve patient outcomes. As the field of endoscopic spine surgery continues to evolve, it is essential to prioritize the conduct of rigorous research studies to establish best practices and treatment guidelines. As more high-quality clinical evidence becomes available, full-endoscopic spine surgery will likely continue to mature and improve, making it a more viable option for patients with spinal conditions.

- **Conflict of Interest:** The authors have nothing to disclose.

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