Opinion
Volume 13:03, 2024

Journal of Spine

ISSN: 2165-7939 Open Access

A Useful Synopsis of Present Prospects for Image-guided Minimally Invasive Therapy of Degenerative Lumbar Spine Disease

Makoto Russo*

Department of Radiology, Cedars-Sinai Medical Center, Los Angeles, CA 90048, USA

Introduction

Degenerative lumbar spine disease, including conditions such as lumbar disc herniation, spinal stenosis, and degenerative disc disease, affects millions of people worldwide, leading to pain, disability, and decreased quality of life. Traditional open surgery for these conditions, while effective, often involves significant recovery times, substantial postoperative pain, and a higher risk of complications. The advent of minimally invasive therapy has revolutionized the treatment landscape, offering patients safer, less painful alternatives with quicker recovery times. Among these advancements, image-guided techniques stand out for their precision and efficacy. This article provides a comprehensive overview of the current prospects and advancements in image-guided minimally invasive therapy for degenerative lumbar spine disease [1-3].

Description

MIT techniques aim to minimize tissue disruption and reduce recovery times compared to traditional open surgery. Key benefits of MIT include smaller incisions, less blood loss, reduced postoperative pain, and shorter hospital stays. However, the success of these procedures relies heavily on precise imaging for accurate diagnosis and guidance during surgery. Imaging is crucial in all stages of MIT, from diagnosis to intraoperative guidance and postoperative assessment. Advances in imaging technologies have significantly enhanced the precision and outcomes of minimally invasive procedures. High-resolution MRI and CT scans are standard for diagnosing degenerative lumbar conditions, providing detailed views of spinal anatomy and pathology. Real-time imaging, such as fluoroscopy, intraoperative CT, and MRI, guides surgeons during procedures, ensuring accurate instrument placement and minimizing the risk of complications. Follow-up imaging assesses the success of the intervention and monitors for any complications or recurrences. Percutaneous disc decompression techniques, such as nucleoplasty and laser disc decompression, use image guidance to accurately target and remove disc material, relieving nerve compression with minimal tissue disruption. Involves the insertion of a specialized probe into the disc under fluoroscopic guidance. Radiofrequency energy is then applied to ablate and shrink the nucleus pulposus, reducing pressure on the nerve roots. Utilizes a laser to vaporize portions of the herniated disc. The laser is precisely guided by fluoroscopy to avoid damage to surrounding tissues. PELD is a minimally invasive procedure for treating herniated discs. A small endoscope is inserted through a tiny incision, allowing direct visualization and removal of the herniated disc material under fluoroscopic guidance. The patient is typically under local anesthesia. A small incision is made, and an endoscope is inserted. The herniated disc material is removed using specialized instruments, while continuous imaging ensures accuracy and safety [4,5].

Conclusion

Image-guided minimally invasive therapy represents a significant advancement in the treatment of degenerative lumbar spine disease. The precision and efficacy of these techniques offer patients safer, less painful alternatives to traditional open surgery, with quicker recovery times and improved outcomes. Emerging technologies, such as robotic-assisted surgery, augmented reality, and artificial intelligence, hold the potential to further revolutionize this field, providing even greater accuracy and enhancing the overall efficacy of treatment.However, several challenges remain, including cost, accessibility, the learning curve for surgeons, radiation exposure, and integration into clinical practice. Addressing these challenges will be essential for the widespread adoption and success of image-guided MIT. As technology continues to evolve, the future prospects for minimally invasive therapy of degenerative lumbar spine disease are promising, offering hope for improved patient care and quality of life.

Acknowledgement

None.

Conflict of Interest

None.

References

1. Borenstein, David. "Does osteoarthritis of the lumbar spine cause chronic low back pain?." *Curr Pain Headache Rep* 8 (2004): 512-517.

2. Goode, Adam P., Timothy S. Carey and Joanne M. Jordan. "Low back pain and lumbar spine osteoarthritis: How are they related?." *Curr Rheumatol Rep* 15 (2013): 1-8.

3. Rubin, Devon I. "Epidemiology and risk factors for spine pain." *Neurol Clin* 25 (2007): 353-371.

4. Hoy, Damian, Lyn March, Peter Brooks and Fiona Blyth, et al. "The global burden of low back pain: Estimates from the Global Burden of Disease 2010 study." *Ann Rheum Dis* 73 (2014): 968-974.

5. Vos, Theo, Ryan M. Barber, Brad Bell and Amelia Bertozzi-Villa, et al. "Global, regional and national incidence, prevalence and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013." *The Lancet* 386 (2015): 743-800.

***Address for Correspondence:** Makoto Russo, Department of Radiology, Cedars-Sinai Medical Center, Los Angeles, CA 90048, USA, E-mail: russom@gmail.com*

Received: 27 May, 2024, Manuscript No. jsp-24-142208; **Editor assigned:** 30 May, 2024, PreQC No. P-142208; **Reviewed:** 15 June, 2024, QC No. Q-142208; **Revised:** 20 June, 2024, Manuscript No. R-142208; **Published**: 29 June, 2024, DOI: 10.37421/2165-7939.2024.13.664

How to cite this article: Russo, Makoto. "A Useful Synopsis of Present Prospects for Image-guided Minimally Invasive Therapy of Degenerative Lumbar Spine Disease." *J Spine* 13 (2024): 664.