

Holmium Laser Solutions for Spine Surgery

Bibliography of Studies & Peer Reviewed Papers

The use of Holmium Laser in spine surgery is relevant for a variety of procedures, with several studies published on its additive effects in minimal invasive spine surgery. The following list presents selected publications from the last 15 years, pointing out the advantages of using Holmium Laser in spinal procedures.

Table of Contents

Peer-reviewed publications of using Holmium Laser for spine surgery

Laser Spine Surgery - an Overview.....	3
Reducing Pain Symptoms.....	4
Reduced Complications.....	6

Laser Spine Surgery - an Overview

Title	Publication	Authors	Year	Short summary of study and conclusion	Laser system
Trans-Sacral Epiduroscopic Laser Decompression for Symptomatic Lumbar disc herniation: A preliminary case series	Photomedicine and Laser Surgery, 34 (3)	Lee SH, Lee SH, Lim KT	2016	<ul style="list-style-type: none"> › Examining the effect of trans-sacral epiduroscopic laser decompression (SELD) with Ho:Yag laser in 250 patients with Low back Pain (LBP) due to a herniated lumbar disc. › Reduced postoperative scores of subjective pain level, in both Visual Analogue Scale (VAS) score (3.6 vs 7.1 for leg pain, and 4.1 vs 5.9 in back pain) and Oswestry Disability Index (ODI) (19 vs 50) improved post-surgery. Postoperative MRI showed a notable decrease in the herniated disc size and a reduction in neural compression › Trans-sacral epiduroscopic laser decompression is an effective therapeutic modality 	Lumenis system 20W
Endoscopic surgery of the lumbar epidural space (epiduroscopy): results of therapeutic intervention in 93 patients	Minim Invasive Neurosurg. Feb;46(1):1-4.	Ruetten S, Meyer O, Godolias G.	2003	<ul style="list-style-type: none"> › Epiduroscopy operation with Ho Laser in 93 patients with chronic back-leg pain syndrome › 45.9 % of these patients presented with positive results in postoperative examination. › Holmium:YAG laser considerably expands therapeutic possibilities and aids in solving the technical problems of epiduroscopy. 	Lumenis system
Ablation of bone, cartilage, and facet joint capsule using Ho:YAG laser	J Clin Laser Med Surg. Oct;20(5):251-5	Hafez MI, Coombs RR, Zhou S, McCarthy ID.	2002	<ul style="list-style-type: none"> › Efficiency of holmium:YAG laser for bone ablation compared to cartilage and soft tissue of the intervertebral foramen of the lumbosacral spine on samples of spinal tissues › Ho:YAG laser is effective for ablating tissues of the intervertebral foramen with a very sharp and clear border with little charring. 	Lumenis system

Reducing Pain Symptoms

Title	Publication	Authors	Year	Short summary of study and conclusion	Laser system
Percutaneous laser disc decompression (PLDD) versus conventional microdiscectomy in sciatica: a randomized controlled trial	Spine J. 1;15(5):857-65	Brouwer PA, Brand R, van den Akker-van Marle ME, Jacobs WC, Schenk B, van den Berg-Huijsmans AA, Koes BW, van Buchem MA, Arts MP, Peul WC.	2015	<ul style="list-style-type: none"> › Effectiveness of Percutaneous laser disc decompression (PLDD) as compared with conventional surgery in 115 patients in two groups › Roland Morris Disability Questionnaire (RMDQ) for low back pain (LBP) improved significantly after the procedure, and was similar in both laser and convectional disc decompression › Using laser for disc decompression yields as good postoperative results in subjective pain and disability reports as conventional surgery 	N/A
The survey of the patient received the epiduroscopic laser neural decompression	Korean J Pain. 26(1):27-31	Jo DH, Yang HJ	2013	<ul style="list-style-type: none"> › Investigation of hospital data on epiduroscopic laser neural decompression (ELND) in 77 patients with Low Back Pain (LBP) › Sixty-seven patients (87.0%) showed symptom relief in a customized subjective questionnaire 2 weeks after the procedure › ELND is an effective treatment alternative for chronic low back and/or lower extremity pain, including lumbar disc herniation, lumbar spinal stenosis, and failed back surgery syndrome 	N/A

Title	Publication	Authors	Year	Short summary of study and conclusion	Laser system
Endoscopic transforaminal thoracic foraminotomy and discectomy for the treatment of thoracic disc herniation	Minim Invasive Surg. 2013;;264105	Nie HF, Liu KX	2013	<ul style="list-style-type: none"> › Presenting minimally invasive technique of removing thoracic disc herniation in 13 patients › Endoscopic thoracic foraminotomy and discectomy under local anesthesia. Discectomy was achieved by using Holmium-YAG laser, grasper or radiofrequency › Patient self-reported satisfactory rate was 76.9%. The mean Visual Analogue Scale (VAS) for mid back pain was improved from 9.1 to 4.2, and the mean Oswestry Low Back Pain Disability Questionnaire (ODI) was improved from 61.0 to 43.8. 	N/A
Percutaneous Lumbar Laser Disc Decompression: A Systematic Review of Current Evidence	Pain Physician 2009; 12:573-588	Singh V, Manchikanti L, Benyamin RM, Helm S, Hirsch JA.	2009	<ul style="list-style-type: none"> › A systematic review of the literature of percutaneous lumbar laser disc decompression. › Laser disc decompression may provide appropriate relief in properly selected patients with contained disc herniation 	N/A
The efficacy of epiduroscopic neural decompression with Ho:YAG laser ablation in lumbar spinal stenosis	Eur J Orthop Surg Traumatol. 2014 Jul;24 Suppl 1:S231-7.	Lee GW, Jang SJ, Kim JD	2004	<ul style="list-style-type: none"> › Evaluate and compare the efficacy of epiduroscopic neural decompression (END) and END with Ho:YAG laser (ELND) in 47 patients with lumbar spinal stenosis. › Reduced postoperative scores of subjective pain level, in both Visual Analogue Scale (VAS) and Roland Morris Disability Questionnaire (RMDQ) for low back pain (LBP) after 6 months after ELND procedure compared with END procedure, and improvement of low back pain (LBP) at the last follow-up › Ho:YAG laser ablation with END could produce reduced intensity pain and prolonged effect of pain relief in LSS patients. 	N/A

Reduced Complications

Title	Publication	Authors	Year	Short summary of study and conclusion	Laser system
Outpatient minimally invasive spine surgery using endoscopy for the treatment of lumbar spinal stenosis among obese patients	J Orthop. 3;12(3):156-9	Hudak EM, Perry MW	2015	<ul style="list-style-type: none"> › Evaluation of endoscopic minimally invasive spinal surgery (MISS) for the treatment of lumbar spinal stenosis among 41 obese patients › Reduced postoperative scores of subjective pain level, in both Visual Analogue Scale (VAS) (2.54 vs. 6.7) and in Oswestry Low Back Pain Disability Questionnaire (ODI) (20.54 vs. 45.51) › Minimally invasive spinal surgery decreases pain and disability scores post treatment with no complications 	N/A
Complications associated with cervical endoscopic discectomy with the holmium laser	J Clin Laser Med Surg. 22(1):57-8.	Haufe SM, Mork AR	2004	<ul style="list-style-type: none"> › Measuring degree of complications after cervical endoscopic discectomy with Ho laser in 41 patients › Cervical endoscopic discectomy has a relatively high success rate, with a low rate of mostly minor complications not connected to the laser application › Cervical endoscopic discectomy represents a new alternative to the treatment of cervical disc disorders 	N/A

Risk information: The use of the Lumenis laser systems, accessories and their delivery devices in spine surgery is contraindicated for patients who are unable to receive endoscopic treatments or are intolerant to prolonged anesthesia, as well as for resection or excision of large vascularized organs. Lumenis Holmium laser systems and accessories are solely intended for use by physicians trained in the use of the Ho:YAG (2.1 μm) wavelength. Incorrect treatment settings can cause serious tissue damage. The laser should be used only on tissues that are fully observable. See the system user manual for a complete list of contraindications and risks.

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