

# PERCUTANEOUS LASER DISCECTOMY. MULTICENTRIC STUDY AT 4 YEARS FOLLOW UP.

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## Abstract

In order to minimize the surgical approach to spine, Disc Herniation treatment has been substituted over the years both by endoscopic approach in which it is possible to practice via endoscopy a laser thermo-discoplasty, both by percutaneous laser discectomy. A 980 nm Diode (**Biolitec AG**) Laser energy introduced via a 21G needle under C-arm or CT-Scan guidance and local anesthesia, vaporizes a small amount of nucleus pulposus with a disc shrinkage and a relief of pressure on nerve root. Because water is the major component of the intervertebral disc, and in HNP (herniated nucleus pulposus) pain is caused by disc protrusion pressing against the nerve root, a 980 nm Diode (**Biolitec AG**) Laser introduced via a 21G needle under C-arm or CT-Scan guidance and local anesthesia, vaporizes a small amount of nucleus pulposus with a disc shrinkage and a relief of pressure on nerve root. Specific optical fibers 360 micron (NA 0.22) permit to concentrate the laser energy on about 4 mm<sup>2</sup> without any damage on surrounding tissues. Most patients get off the table pain free and are back to work in 5 to 7 days.

**Material and Method:** A multicentric retrospective study on 1000 patients (1350 cases) suffering for relevant symptoms therapy-resistant 6 months on average before the treatment, has been performed. Both contained and non contained disc herniations were treated. Subannular and transannular extrusions were treated under CT-Scan Guidance (**Aquilion 64 Slices Toshiba**). No free disc fragment (absolute contraindication) has been treated. The average energy delivered in a pulsed wave was of 1500 Joules (12 Watt, 2 sec. pause, 0.60 sec. exposure time). The average age of patients operated was 46 years (18 – 79). In 96 cases the procedure has been performed after an unsuccessful microsurgical approach with a relapse of the disc herniation.

**Results:** The success rate at a mean follow-up of 48 months was 87% with a complication rate of 0.5%. No discitis (septic or aseptic) and no nerve root damage has been detected. A statistically significant difference ( $p < 0.05$ ) was found in the results in the cases performed under CT-Scan Guidance. The cases performed under C-arm had a successful rate of 77.5%. In conclusion the procedure appear to be nowadays a safe and valid alternative to the microsurgery, particularly under CT-Scan guidance, in order to visualize the nerve root and also apply energy on several points of disc herniation. This permits to have a shrinking concentrated in a bigger area, realizing a minimal invasiveness on the spine to be treated, and avoiding the potential complications related to the microdiscectomy (recurrence rate of more than 8-15%, peridural scar in more than 6-10%, dural sac tear, bleeding, iatrogenic microinstability).