Percutaneous Laser Disc Decompression And Surgical Outcomes Of The Treatment Of Lumbar Disc Herniation – Overview Of 141 Patients

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The authors have no potential conflict of interest to report.
Percutaneous laser disc decompression (PLDD) is a minimally invasive, non-open surgical technique, which uses laser energy to vaporize the nucleus pulposus in a percutaneous way (Fig.1).

This technique has been used for over 30 years, but the safety and efficacy of PLDD is still often a concern of both physicians and patients. Some authors even go so far as to doubt that it has benefits at all. Our goal with this retrospective study was to add our clinical experience to this debate.

Fig.1: Positional verification with X-ray, anteroposterior view (left), percutaneous laser disc decompression (right)
The data of altogether 141 patients were analyzed. Of them, 58 were male (41%) and 83 were female (59%). The mean age was 49.43 years. The average pre-procedure VAS score was 8.3 at the back pain and radiculopathy. The average post-procedure VAS score at the six week control was 3.4 at the back pain and 3.5 at the radicular pain. After six months, the average VAS scores was 3.3 at the back pain, and 3.5 at the radicular pain (Table 1).

Classification according to the Macnab criteria was possible in 130 cases (92% of all cases). The outcome was excellent in 73 cases (56.2%), good in 15 cases (11.5%), fair in 5 cases (3.9%) and poor in 37 cases (28.5%). PLDD had to be repeated in 11 patients (7.8%) because of the recurrence of the same symptoms or symptoms in other dermatomes. The repeated procedures were performed in another segment or on the contralateral side of the previously operated segment. Twenty-one of these patients needed open spine surgery, and another 21 required steroid injections after PLDD. Immediate and complete pain relief we observed in 38 patients (26.9%).

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<tr>
<th></th>
<th>Back</th>
<th>Radicular</th>
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<tr>
<td>PRE</td>
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<td>8.27</td>
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<td></td>
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<td></td>
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<td>SD</td>
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Table 1: Descriptive statistics of the VAS scores. Back: scores for back pain; Radicular: scores for pain related to the radicular syndrome. PRE: preoperative scores; POST6W: scores 6 weeks after PLDD; POST 6M: scores 6 months after PLDD.
The results of our study are quite similar to the findings of other groups, but also somewhat different. Tassi and colleagues reported good or excellent outcome of 84% according to the Macnab criteria [1]. Grönenmeyer and co-workers observed patients in a 3±2-year period and found that only 43% of the patients remained completely pain-free, which - while the authors do not refer to the Macnab criteria directly - implies excellent outcome [2].

Our results indicate 67.7% good or excellent immediate outcome, which a median of 60% of the patients could maintain for at least two years. In contrast to the study of Grönenmeyer et al. [2], who reported that 15.5% of their patients experienced no pain relief et all after PLDD, we found no such cases. All of our patients experienced at least temporary pain relief (which was complete relief in 26.9% of our patients), as indicated by their VAS scores. Erbas et al. reported that 12.7% of their 197 patients (9 female and 16 male) needed microsurgical discectomy after PLDD (5), which is in line with our finding of 15%.

Table 2: A summary of the follow-up of VAS scores (N=137). *Missing: in the case of four patients, we could not retrieve VAS data.
In summary, based on our experience, we highly recommend PLDD as a first minimally invasive surgical choice for lumbar disc herniation, but we propose that there are aspects that still need to be explored.

Of such aspects, we consider the long-term maintenance of the favorable outcomes, the reasons behind failure, and effects on patient’s quality of life the most important ones.

References: