RESEARCH JOURNAL OF TRAUMA AND DISABILITY STUDIES

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

Modern Treatment of Herniated Disc L5-S1 with Endoscope

Karimov Komiljon Kamolovich
Bukhara State Medical Institute

Relevance

Endoscopic hernia removal is currently one of the most effective and, at the same time, relatively safe methods of treating intervertebral hernia of the lumbosacral spine. The vast majority of the adult population periodically experiences pain in the spine. In severe forms of osteochondrosis, compression of one or more spinal nerve roots by a herniated disc develops. In this case, the patient develops pain in a "band" throughout the arm or leg, sensitivity is impaired, strength in certain muscles may decrease. Initially, conservative treatment is carried out by a neurologist. If treatment is ineffective for 1-2 months, surgical treatment is indicated — removal of a herniated disc. It is urgently necessary to perform surgery with the development of gross weakness in the extremities and violation of urination.

The purpose of the study evaluation of the effectiveness of transforaminal endoscopic discectomy in combination with puncture nucleoplasty in the treatment of hernias of the lumbosacral spine.

Materials and methods. The results of endoscopic discectomy with nucleoplasty in 142 patients (74 men and 68 women) aged 21 to 66 years were evaluated as materials and methods of the study. The duration of follow-up in the postoperative period averaged 18.7±6 months (from 7.2 to 28 months). To assess the clinical effectiveness of the performed surgical interventions, the dynamics of the pain syndrome was analyzed using a visual analog scale (VAS). The condition of patients, pain syndrome and the degree of impairment of vital activity were assessed by the Oswestry Index (ODI). Postoperative complications were also analyzed to assess the results of the operation. In this study, the effectiveness of this method in 142 patients was examined.

First of all, subjective criteria were evaluated - the level of pain syndrome and the degree of impairment of vital activity. Results. In all patients, there was a decrease in the intensity of the pain

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

syndrome and an improvement in the parameters of vital activity. VAS indicators more than halved within six months after the operation, ODI - tripled. Due to the absence of similar studies (endoscopy plus nucleoplasty), the results of our work were compared with the results of endoscopic hernia removal without nucleoplasty. When comparing the results of the subjective assessment of the condition of patients after surgery in this study with the literature data, some intra- and postoperative complications were observed in this sample of patients. Conclusions. The use of puncture nucleoplasty as the second stage of minimally invasive removal of an IVD hernia is an effective treatment method, significantly reducing the frequency of relapses of the disease.

The history of spinal endoscopy is closely related to the name of an American orthopedist of Iranian origin. He began practicing posterolateral access to the adjacent intervertebral disc (IVD) using a cannula for biopsy during an open intervention. With its help, the mechanical removal of a part of the pulpous nucleus was performed. In the middle, he also developed an original instrument for puncture access and described the zone of safe entry into the IvD, called "triangle", proposed methods of arthroscopic discectomy and endoscopic posterior interbody fusion, then developed the principles of endoscopic decompression of degenerative spinal canal stenosis in the original port for interlaminar access [1.3.5.7].

Thanks to further work, endoscopic surgery has now taken a strong position in the treatment of degenerative-dystrophic diseases of the spine (DDZP), competing with microsurgery. It is impossible not to mention the works of T.G. Obenchain, P.J. Connolly with co-authors and M.J. Mack with co-authors devoted to thoracoscopic and laparoscopic techniques of spinal surgery. In Russia, the development and popularization of endoscopic technologies were engaged in.

Two fundamentally different variants of endoscopic operations are used for surgical treatment of IVD hernias and degenerative spinal canal stenosis. Microendoscopic discectomy involves interlaminar access using a tubular retractor using the same surgical instruments and techniques as for microdiscectomy, only an endoscope is used for visualization.

In endoscopic or arthroscopic discectomy, a rigid endoscope with a working channel is used in conditions of constant irrigation with saline solution, which ensures less access injury (the diameter of the endoscope does not exceed 10 mm). Historically, the posterolateral approach was the first to be proposed, when a working cannula was inserted directly into the IVD cavity and the mass of the pulpous nucleus was removed. a prerequisite for the development of interlaminar endoscopic discectomy was the presence of technical difficulties with posterolateral access to the LV-SI gap in men with a high standing of the iliac crest and the smallest size of the intervertebral openings. Interlaminar access to other levels, including in cases of degenerative spinal canal stenosis, became possible as a result of the improvement of endoscopic shaver systems and the appearance of

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

endoscopes with a working channel of 5 mm, through which it became possible to establish bone cutters.

Attempts to medialize access to the IVD for partial visualization of the spinal canal began to be made in parallel with the development of posterolateral access, however, its significant limitation in some patients was the upper articular process to use laser radiation for foraminoplasty, high-frequency ablation, but this allowed only soft tissues to be reduced in size. Full-fledged transforaminal access became possible only with the advent of technologies that allow expanding the intervertebral opening. They suggested using a Rimer crown cutter for this. The appearance of endoscopic shaver systems made it possible to resect bone structures using boron under visual control.

The results of endoscopic transfor-mal discectomy and factors affecting the prognosis of the intervention, which led to the need for this study. The main group included data from a prospective study of 142 patients operated on for herniated intervertebral discs of the lumbar spine using the method of transforaminal endoscopic discectomy. The age of the patients ranged from 21 to 66 years, averaged 41.4±12.6 years. The criterion for inclusion in the study was surgical intervention at the same level for primary hernia of the IVD. Exclusion criteria: degenerative spinal canal stenosis, spondylolisthesis, spinal deformity.

Endoscopic intervention was performed under general anesthesia with tracheal intubation in the patient's position lying on his stomach on the Wilson frame. After preliminary marking under fluoroscopic control, the optimal trajectory of the instruments was selected. In most cases, access was carried out at a distance of 12-14 cm from the line of spinous processes at the level of L V-Sj, 10-12 cm — at the level of LIV-Lv, 6-8 cm at the overlying levels. In the direct projection, the localization of hernial protrusion was taken into account during planning, taking into account the position of the iliac crest. Thus, with caudal migration and/or lateral position, the access trajectory became steeper in the coronary plane, with cranial migration and/or medial localization — more gentle. In the lateral projection, the conditional access line had to intersect the bottom-upper edge of the body of the underlying vertebra and the apex of the upper articular process. The installation of a puncture needle, a flexible conductor, consecutive dilators and a working cannula were also carried out under direct and lateral fluoroscopic control. The aim was to bring the instrument into contact with the IVD in the spinal canal in the subarticular zone along the medial pedicular line [2.4.6.8.10].

If necessary, for additional expansion of the intervertebral opening, an endoscopic shaver system with a diamond boron under visual control was used. After the foraminoscope was installed, the epidural space was revised, free and/or fragments of IVD were removed, the IVD cavity was revised, the fibrous ring and the posterior longitudinal ligament were coagulated to reduce them in volume, if necessary, using bipolar coagulation. Hemostasis was carried out by bipolar coagulation and an

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

increase in fluid pressure. A single skin suture was used to suture the wound. The patient was discharged the next day in the absence of complications.

Microdiscectomy was performed using an operating microscope and a tubular retractor system with a port diameter of 16 mm. The most economical resection of bone structures was performed in the volume of laminotomy, if necessary — medial facetectomy, as well as limited resection of the yellow ligament. After the revision of the epidural space, the IVD elements causing compression of the radicular nerve were removed. Aggressive curettage of the disc was not used in any case.

The assessment of the clinical effectiveness of the performed surgical interventions was based on the analysis of the dynamics of the pain syndrome according to the NRS-11 digital pain scale and disorders due to back pain according to the Oswestry Disability Index. The patients were interviewed before the operation and a year after it was performed.

According to the medical history and preoperative MRI, the following factors were taken into account and analyzed: the type and localization of the IVD hernia according to the recommendations of the American Association of Neuroradiologists, the degree of degeneration of the operated IVD according to C.W. Pfirrman with co-authors, the degree of degenerative changes in bone tissue in the operated and adjacent segments according to M.T. Modic with co-authors, the presence of sacralization or lumbalization, the presence of and the degree of foraminal stenosis according to S. Lee (only for the main group). For the main group of patients, spondylography of the lumbosacral spine was additionally analyzed in a standing position with the calculation of PI, SS, PT, LL indicators and the determination of the type of pelvic-spinal relations.

Complications after surgical intervention, failures of surgical treatment (conversion of endoscopic intervention to open, revision surgery within 3 months after the primary), repeated surgical interventions in case of recurrence of IVD hernia within more than 3 months from the moment of the primary surgical intervention were also taken into account. The influence of the above factors on the outcome of surgical intervention in the main and control groups was analyzed, as well as their relationship with the development of recurrent IVD hernias in patients and revision interventions. Checking the compliance of the empirical distribution laws of the indicators used revealed a significant difference between them and the theoretical law of normal distribution according to the Kolmogorov — Smirnov criterion ($p<0.05$). Median and interquartile were used to statistically describe these indicators, and nonparametric methods of analysis widely covered in the literature were used to test statistical hypotheses. Among them is an assessment of the significance of differences in quantitative indicators in independent and related samples by the Mann-Whitney U—criterion and the Wilcoxon criterion, as well as an assessment of the degree of influence of the qualitative factor on the variance of quantitative indicators using the ANOVA variance ranking

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

method of the Kruskal—Walis test.

The increase in neurological deficit was noted only in one case in the main group and was associated with obvious damage to the root, in 2 patients the deficit regressed 1 month after surgery. In the main group, the case of hematoma formation (retroperitoneal) did not require intervention, in the control group, due to the formation of an epi-dural hematoma, an audit was performed. Revision interventions in all patients of the main group were performed for persistent pain syndrome caused by incomplete removal of a herniated IVD. Root decompressions in all cases were represented by open interventions. Access conversion was carried out with uncertainty about the usefulness of decompression and in 2 out of 7 cases was unjustified. In 4 out of 7 cases, the conversion was performed at the supracrestal level and only in one case was associated with the technical impossibility of access due to the peculiarities of the anatomy of a patient with a transitional vertebra C, d In the remaining 3 cases, it was not possible to carry out adequate transfor-raminal access with visualization of the spine, access was carried out through IVD. With intervention at other levels, the conversion was associated with the inability to remove the sequestered fragment during its cranial or caudal migration [11.13.15].

Thus, in the overwhelming majority of cases (in 11 (10.9%)) patients, the failure of transforaminal endoscopic dissectomy was determined solely by the inadequacy of transforaminal access. According to MRI data, these patients had features of the anatomy of the lower part of the intervertebral opening in the area of the intended entrance of the endoscope: in 3 out of 11 cases, in the form of a decrease in the height of the intervertebral opening due to a significant decrease in the height of the IVD and the displacement of the base of the upper articular process into the access zone. There were no significant differences in the course of the early postoperative period, clinical results, the frequency of relapses and the number of complications. A meta-analysis performed by C. Birkenmaier and co-authors revealed 504 papers in which the effectiveness of endoscopic and open discectomy was evaluated. There were no statistically significant differences in clinical results, the frequency of complications and relapses, differences occurred in the severity of postoperative pain syndrome, the timing of hospitalization and recovery of working capacity.

In our study, endoscopic transforaminal discectomy has shown its effectiveness in the treatment of radicular pain syndrome in IVD hernias, comparable to the effectiveness of microdiscectomy within up to a year from the date of surgery. In our study, the frequency of intraoperative complications was higher compared to other studies. In the publications of I.A. Borshchenko and co-authors, the number of all complications reached 3.8%, A.T. Khudyaev and co-authors report about 1.7%, A.T. Yaung and P.M. Tsou about 3.5%, S. Ruetten and co-authors about 1.5% of complications. In our study, complications in the main group amounted to 10.9% compared to 1.3% in the control group,

Volume: 2 Issue: 11 | Nov – 2023 ISSN: 2720-6866
http://journals.academiczone.net/index.php/rjtds

but most of the complications were asymptomatic, neurological deficiency was observed in only 3 (2.9%) patients. Of the three cases of an increase in neurological deficit in the form of a picture of isolated suffering of the outgoing root, only one was associated with direct damage to the root, and the remaining two occurred without obvious damage at the levels of Ljj-Ljjj and LItI-LIV. It is worth noting that at the upper lumbar levels, the size of the intervertebral opening is the largest, and damage to the exiting root during access is practically excluded. Most likely, excessive lateral traction of the spine is associated precisely with the extremely free movement of the endoscope in the intervertebral foramen. Y. Ahn and co-authors also report 8.9% unsatisfactory results with interventions at the upper lumbar levels. Of course, the existing complications are associated with the learning curve and occurred in the debut of independent surgery, which corresponds to the data of other authors describing the first experience of using endoscopy.

The overall frequency of repeated interventions after transforaminal endoscopic disc ectomy, according to the literature, ranges from 1.69 to 8.9%. It should be noted that in many cases, revision interventions were carried out for radicular pain syndrome due to persistent compression of the residual hernia of the IVD. In the present study, surgical treatment was unsuccessful in 14 (13.9%) patients, they were actually re-operated openly as a result of conversion or repeated intervention in the near future after the initial operation, as a result of which the final positive result was achieved.

The analysis of revision operations showed that the main problem in all cases was also inadequate access to the spinal canal, as a result of which the subclavian and/or sequestered component of the IVD hernia was preserved. The result of such access was the impossibility of adequate visualization of the spinal canal and, as a consequence, the inability to control the completeness of decompression of nerve structures, which was achievable only in cases of maintaining the connection of the dropped fragment with the IVD cavity, when it was first set into the IVD, and then removed through the inserted cannula (the so-called inside-out technique).

The use of bendable wire cutters slightly improved access errors, removal of migrated fragments was impossible. The problem of technical aspects of transforaminal access, according to the literature, is extremely relevant. Various options for calculating the trajectory of access, access through the iliac bone, are proposed, the possibilities of using endoscopic shaver systems for foraminoplasty are shown. The use of an endoscopic shaver system makes it possible to solve the problem of inadequate access by expanding the intervertebral opening under the control of vision, however, it is necessary to note the relatively high cost of disposable diamond drills [10.12.14.15].

The present study revealed certain patterns between the constitutional features of the spine, the structure of the intervertebral joints and holes that can assist in preoperative planning. However, further studies involving more patients are needed to identify a significant link.

Volume: 2 Issue: 11 | Nov – 2023 **ISSN: 2720-6866**
http://journals.academiczone.net/index.php/rjtds

Conclusions

Endoscopic discectomy is an effective and safe method of surgical treatment of intervertebral hernias of the lumbar spine, comparable to open discectomy. The high level of complications (10.9%) and unsuccessful (13.9%) results of surgical treatment in our study are determined by the shortcomings of surgical technique and errors in planning and performing transforaminal access during the period of mastering endoscopic surgery. The features of the constitution of the spine in the form of hyper- or hypolordosis with characteristic changes in the anatomy of the facet joints and intervertebral openings allow predicting technical difficulties with transforaminal access.

REFERENCES

1. Kambin P. History of Surgical Management of Herniated Lumbar Discs from Cauterization to Arthroscopic and Endoscopic Spinal Surgery. In: Arthroscopic and endoscopic spinal surgery: text and atlas. Totowa, NJ: Humana Press; 2005. pp. 1-29.
2. Foley K.T., Smith M.M. Microendoscopic discectomy. Tech Neurosurg. 1997;3(4):301-307.
3. Savitz M.N. Same-day microsurgical arthroscopic lateral-approach laser-assisted (SMALL) fluoroscopic discectomy. J Neurosurg. 1994;80(6):1039-1045. DOI:10.3171/jns.1994.80.6.1039.
4. Ruetten S., Komp M., Merk H., Godolias G. Use of newly developed instruments and endoscopes: full-endoscopic resection of lumbar disc herniations via the interlaminar and lateral transforaminal approach. J Neurosurg Spine. 2007;6(6):521-530. DOI:10.3171/spi.2007.6.6.521.
5. Destandau J. A special device for endoscopic surgery of lumbar disc herniation. Neurol Res. 1999; 21(1):39-42. DOI: 10.1080/01616412.1999.11740889.
6. Ahn Y., Lee S., Shin S. Percutaneous endoscopic cervical discectomy: clinical outcome and radiographic changes. Photomed Laser Surg. 2005;23(4):362-368. DOI: 10.1089/pho.2005.23.362.
7. Teshaev Sh.J., Xudoyberdiyev D.K., Davlatov S.S. The impact of exogenous and endogenous factors on the stomach wall, macro-, microscopic anatomy of newborn white rats // International Journal of Pharmaceutical Research. – 2021. – Vol. 13. – P. 679-682. (Scopus)
8. Khudoyberdiev Dilshod Karimovich, Ostonova Malohat Namoz qizi. MRI diagnostics of meniski injuries in knee joint injury//International multidisciplinary journal of development of the scientific world (IMJDSW)/Volume 1 Issue, 3 September 2022, P-25-31

Volume: 2 Issue: 11 | Nov – 2023 **ISSN: 2720-6866**
http://journals.academiczone.net/index.php/rjtds

9. Khudoyberdiev Dilshod Karimovich, Muratov Ramazon Farkhodovich.Possibilities of Magnetic Resonance and Multispiral Tomography in Urooncology//International Journal of Health Systems and Medical Sciences ISSN: 2833-7433 Volume 2 | No 4 | April -2023. Page. 104-108
10. Khudoyberdiyev Dilshod Karimovich, Bahronov Fayzullo Abduraufovich,RADIATION DIAGNOSTICS OF AN ALTERED HIP JOINT//Scientific journal of research in medicine (sjrm) Article available online: https://savanticjournals.uz Volume 1 Issue 3 September 2022. 38-5
11. Amrilloevich N. D. Features of the application of external osteosynthesis in gonarthrosis //Asian journal of Pharmaceutical and biological research. – 2021. – Т. 10. – №. 2.
12. Uli Z. A. K., Amrilloevich N. D. MORPHOLOGICAL CHANGES IN THE HYALINE CARTILAGE OF THE KNEE JOINT AGAINST THE BACKGROUND OF INTRA-ARTICULAR ADMINISTRATION OF THE PREPARATION OF HYALURONIC ACID IN RATS WITH EXPERIMENTAL OSTEOARTHRITIS //Asian journal of pharmaceutical and biological research. – 2021. – Т. 10. – №. 3.
13. Uli Z. A. K., Amrilloevich N. D. MORPHOGENESIS OF HYALINE CARTILAGE OF THE KNEE JOINT AGAINST THE BACKGROUND OF INTRA-ARTICULAR INJECTION OF PLATELET-RICH AUTOLOGOUS PLASMA //Asian journal of pharmaceutical and biological research. – 2021. – Т. 10. – №. 3.
14. Ziyadullaev Abdusalom Khabibulla oglu. EVALUATION OF THE FUTURE RESULTS OF APPLICATION OF ARTHRO-MEDULLARY BYPASSING IN GONARTHROSIS. // Asian journal of Pharmaceutical and biological research. Volume 10 Issue 2 MAY-AUG 2021
15. В.Р. Акрамов, Ш.Ш. Ахмедов, Б.У. Хамраев, А.А. Тешаев Э.М. Хаятов, У.У. Раджабов., Эндопротезирование тазобедренного сустава при переломах шейки бедренной кости //. Проблемы биологии и медицины.- Самарканд №3 (96) 2017. стр- 23-26.