ABSTRACT

Objective: To evaluate the degree of patient satisfaction and complications after endoscopic surgery for the treatment of lumbar disc herniation. Methods: We retrospectively evaluated 94 patients with lumbar disc herniation undergoing endoscopic lumbar discectomy through the MacNab questionnaire and four subjective questions related to the procedure. Results: Approximately 82% of the patients had good and excellent results, and 91.4% reported being satisfied with the surgical result obtained with endoscopy. The rate of complications with the method was 9.5%, with recurrent disc herniation being the most common complication (5.4% of cases). Conclusions: Endoscopic surgery proved to be an effective and safe method, and an alternative to conventional open surgery. Level of evidence; III. Therapeutic studies - Investigation of treatment results.

Keywords: Spine; Endoscopy; Sciatica; Complications.

INTRODUCTION

Lumbosciatalgia is one of the most common complaints in orthopedic practice and approximately 5% of the cases seen result from disc herniation. According to the natural history of disc herniation, around 95% of patients improve completely after three months of conservative treatment.1,2 Patients who are refractory to clinical treatment or who present progressive neurological worsening have the therapeutic option of surgical intervention.1 Among surgical treatments, the open microdiscectomy is considered the gold standard.1,3,4 With technology advances and the interest in making modern surgical treatment techniques available, minimally invasive surgeries have been developed.3,5,6 Despite the fact that less invasive techniques have a long learning curve, higher cost, and longer surgical time, this treatment is the trend and literature data have shown that this method is safe, and its indication is increasing in as the technique gains acceptance.3,6-10 Minimally invasive spinal surgery has gradually evolved, endoscopic equipment being improved and demonstrating progressive success and, currently, two percutaneous decompression techniques are the most used: transformaminal, described in 2004 by Tsou and Yeung, and interlaminar, described by Choi in 2005.7 The advantages of using minimally invasive techniques are a smaller surgical incision and less aggression of the soft tissues (multifidus muscles and intervertebral ligaments), shorter recovery times, and a faster return to normal activities.8-10

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muscles, ligaments, and the facet joint capsules). Less aggression generates less local pain, in addition to using minimal bone resection for the discectomy, which can prevent possible spinal instability.5,9,11-16

The objective of this study was to evaluate the surgical results obtained using endoscopic discectomy to treat lumbar disc herniation and the complications associated with the method.

METHODS

This was a retrospective descriptive study, approved by the Institutional Review Board of the Hospital do Trabalhador as CAAE number 64275817.3.0000.5225. Data was collected from 94 patients who underwent endoscopic surgery (transforaminal or interlaminar) at the Hospital do Trabalhador, Curitiba-PR, during the period from January 2104 to December 2016. The interlaminar approach was indicated for patients with central or central-lateral herniations, while we opted for the transforaminal approach in patients with foraminal and extraforaminal herniations. The clinical assessment was conducted by means of the MacNab questionnaire,17 with the addition of four yes or no questions to be answered by the patients, as shown in Table 1.18

Epidemiological data such as age, sex, return to work, were evaluated together with postoperative complications, including infection of the surgical site, neurological changes (pareses, paresthesias), neural lesions, and iatrogenic durotomy. We also collected data about recurrence of the disc herniation.

Patients previously submitted to surgical spinal treatment for any other reason, those below 18 or above 80 years of age, those with postoperative follow-up less than 6 months, and those who did not sign the informed consent form were excluded. All patients participating in this research signed the informed consent form.

RESULTS

Ninety-four patients who underwent endoscopic surgical treatment for lumbar disc herniation were included in this study. Fifty-two (55.3%) patients were female and 42 (44.7%) were male. Their ages ranged from 18 to 79 years, with a mean of 39 years of age. Of these patients, seventy-eight (82.9%) were treated using the interlaminar technique and 16 (17.1%) with the transforaminal technique. (Figure 1)

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Table 1. Questionnaire given to the patients.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes (%)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Since the endoscopic surgery, have you had lumbar symptoms at the same level?</td>
<td>68</td>
<td>26</td>
</tr>
<tr>
<td>Are you satisfied with the results of the endoscopic surgery?</td>
<td>94.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Based on your experience, would you undergo the same endoscopic surgery in the future or recommend it to someone you know?</td>
<td>89</td>
<td>5</td>
</tr>
<tr>
<td>Did your spine or leg symptoms worsen following surgery?</td>
<td>68</td>
<td>26</td>
</tr>
</tbody>
</table>

As regards return to work, 68 (72.3%) patients returned to work and 26 (27.6%) did not return. Of those who did not return, seven (7.4%) were involved in labor grievances, two (2.1%) were retired, eight (8.5%) had recurrences/complications, and 10 (10.6%) patients had no complications, but had been evaluated as MacNab 3 or 4, and were on leave receiving benefits. (Figure 4)

DISCUSSION

The gold standard treatment for lumbar disc herniation is open microdiscectomy, however, with advances in medicine and in minimally-invasive techniques, endoscopic surgery is increasingly being used to treat herniated discs.19-22

We observed that 9 (9.5%) cases presented complications. No case of total neurological lesion was reported, however, we had 4 (4.2%) cases of dyspraxia that evolved with improvement of the condition in the third month following surgery. Two (2.1%) patients had large herniated volume and continued to complain of postoperative sciatalgia. Magnetic resonance was performed and we observed insufficient removal of the herniated content in one of them and the other underwent endoscopic revision surgery. Two cases (2.1%) presented lesions of the dura mater, which did not progress to cerebrospinal fluid fistulas and improved clinically following conservative treatment. One case (1.06%) progressed with discitis and an epidural abscess, requiring surgical debridement, open compression, and posterior approach arthrodesis. Five (5.4%) patients suffered relapse and needed revision with open decompression and posterior approach arthrodesis.

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Figure 1. 1- and 2-level interlaminar and transforaminal approaches.

Figure 2. Total number of levels by technique used.

Figure 3. Patient satisfaction index according to the MacNab questionnaire.
The overall complications rate in our study was 9.5%, lower than that of the gold standard technique at 12.5%.14 We observed no complete neurological injury, however, we had 4.2% of cases with dysphasia that evolved with improvement by the third month following surgery. In a study published by Choi et al., the authors reported 12% of patients with this complication, with improvement of the condition occurring during the first month of follow-up.15

Transoperative durotomy occurred in two cases (2.1%), less than the results for the open technique reported by Desai et al.,21 who observed 3.1% with this complication. Our cases did not require repair and did not progressed to cerebrospinal fluid fistulas during follow-up, and were treated conservatively with 48 hours in dorsal decubitus, restricted fluids, and analgesic medications. The literature reports an incidence of between 1 and 17% of dural lesions, depending on the patient and on the procedure performed.14

We did not observe complications with the surgical wound, however, one patient evolved with an infection of the disc space and an epidural abscess, which required ample posterior decompression and drainage and arthrodesis. Yeung and Tsou had two cases of pyogenic discitis in their study of 307 patients.12

The recurrence rate was 5.4%. All patients underwent open surgical decompression followed by posterior approach arthrodesis. In a meta-analysis by Shriver et al, recurrences of 4.4%, 3.1%, and 3.9% were observed for the open technique, endoscopic microdiscectomy, and percutaneous microdiscectomy, respectively.14 Ruetten et al. reported recurrence of 6.2%.21 Similar relapse rates are shared by other authors.3,12,22

In this study we observed complications reported in other studies, such as thrombophlebitis, urinary retention, excessive bleeding, hematoma, seroma, and complete nerve root lesion.11,12,14,15,21

The return to work rate was 72.3%. In a multicenter study, Kahanovitz et al. reported a return to work rate of 55%. Pimenta et al. observed 80.6% return to work.10,23

CONCLUSION

Endoscopic surgery for the treatment of lumbar disc herniation presented 82% excellent and good results as evaluated by the MacNab questionnaire and 91.4% of the patients reported being satisfied with the surgical outcome. The option to use minimally invasive techniques is a trend in medicine and endoscopic surgery has proven to be a safe and effective technique with results that are comparable to the traditional approach.

All authors declare no potential conflict of interest related to this article.

CONTRIBUTION OF THE AUTHORS: Each author made significant individual contributions to this manuscript. CG (0000-0002-3709-2880)*, XSG (0000-0002-9636-9165)*, and ALK (0000-0002-0132-6083)* were the main contributors to the writing of the manuscript. ALK performed the surgeries. ALK, PGS (0000-0002-8326-4823)*, and CG conducted patient follow-up and collected the clinical data from the medical records together with XSG and MLB (0000-0002-2903-8550)*, who also evaluated the statistical analysis data. CG, XSG, and ALK conducted the bibliographical research, reviewed the manuscript, and contributed to the intellectual concept of the study. *ORCID (Open Researcher and Contributor ID).

REFERENCES


Table 2. Results from the questions asked.

<table>
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<td>Since the endoscopic surgery, have you had lumbar symptoms at the same level?</td>
<td>68 (72.3%)</td>
<td>26 (27.7%)</td>
</tr>
<tr>
<td>Are you satisfied with the results of the endoscopic surgery?</td>
<td>86 (91.4%)</td>
<td>8 (8.6%)</td>
</tr>
<tr>
<td>Based on your experience, would you undergo the same endoscopic surgery in the future or recommend it to someone you know?</td>
<td>89 (94.6%)</td>
<td>5 (5.4%)</td>
</tr>
<tr>
<td>Did your spine or leg symptoms worsen following surgery?</td>
<td>5 (5.4%)</td>
<td>89 (94.6%)</td>
</tr>
</tbody>
</table>

Figure 4. Employment status following surgery.


