LUMBAR ENDOSCOPIC DISCECTOMY IN OBESE PATIENTS

DISCECTOMIA ENDOSCÓPICA LOMBAR EM PACIENTES OBESOS

INTRODUCTION

Obesity is a global health issue and its prevalence is increasing. In relation to the spine, obesity is associated with overload, especially in the lumbar region, causing damage to the integrity of the intervertebral discs. Therefore, a high body mass index has been implicated as a risk factor for lumbar disc degeneration. Obese patients are more likely to have radicular pain, neurological alterations, and disc herniations.

Surgical treatment in obese patients requires a wide incision to permit an adequate deep visualization, thus causing greater damage to the paravertebral muscles and greater postoperative morbidity.

Endoscopic lumbar discectomy has been developed as a minimally invasive technique for disc herniation, offering several advantages, such as less tissue damage with the preservation of advantages, such as less tissue damage with the preservation of

Keywords: Intervertebral disc displacement; Diskectomy, Percutaneous; Endoscopy; Minimally Invasive Surgical Procedures; Obesity.

RESUMEN

Objetivo: El objetivo de este estudio fue evaluar los resultados clínicos y funcionales de la discectomía endoscópica lombar en pacientes obesos.

Métodos: Se seleccionaron 56 pacientes portadores de hernia de disco lombar refractaria al tratamiento clínico que se sometieron a discectomía endoscópica. Se analizaron los datos obtenidos en el período preoperatorio, en el postoperatorio inmediato, 1 mes, 3 meses, 6 meses y un año después de la cirugía. Resultados: La media del IMC en el grupo control fue de 22,1 kg/m², y en el grupo obeso de 33,6 kg/m². En ambos grupos hubo una mejora estadísticamente significativa en los análisis clínicos y funcionales. Conclusión: La discectomía endoscópica transforaminal lombar mostró ser una alternativa segura, eficaz y mínimamente invasiva para el tratamiento de hernia discal lumbar en pacientes obesos.

Descritores: Desplazamiento del Disco Intervertebral; Discectomía Percutánea; Endoscopia; Procedimientos Cirúrgicos Mínimamente Invasivos; Obesidad.

RESUMO

Objetivo: A meta do estudo foi avaliar os resultados clínicos e funcionais da discectomia endoscópica lombar nos pacientes obesos.

Métodos: Foram seleccionados 56 pacientes portadores de hérnia de disco lombar refratário ao tratamento clínico que submeteram-se à discectomia endoscópica. Foram analisados dados obtidos no período pré-operatório, no pós-operatório imediato, com 1 mês, 3 meses, 6 meses e um ano após a cirurgia. Resultados: O IMC médio no grupo controle foi de 22,1 kg/m², e no grupo obeso de 33,6 kg/m². Em ambos os grupos houve melhora estatisticamente significativa nas análises clínicas e funcionais. Não se observou diferença estatística entre os grupos. Conclusão: A discectomia endoscópica transforaminal lombar mostrou ser uma alternativa segura, efetiva e minimamente invasiva para o tratamento de hérnia de disco lombar em pacientes obesos.

Descritores: Deslocamento do Disco Intervertebral; Discotomia Percutânea; Endoscopia; Procedimentos Cirúrgicos Minimamente Invasivos; Obesidade.

Received on 04/29/2018 accepted on 11/13/2018

http://dx.doi.org/10.1590/S1808-185120191803196929
METHODS

Obesity was defined by the body mass index (BMI), which is calculated by divided body weight in kilograms by the height in meters squared (Kg/m²). Patients with a BMI equal to or greater than 30 Kg/m² were considered obese.

A total of 100 patients underwent endoscopic transforaminal lumbar discectomy between April 2015 and April 2016 for lumbar disc herniation refractory to clinical treatment. This study compared the clinical findings of the obese patients (BMI greater than 30 Kg/m²) with those of patients with a normal BMI (between 18.5 and 24.9 Kg/m²). This study was submitted to and approved by the Institutional Review Board of the Faculdade de Medicina do ABC (CAAE 85551418.0.000.0082). All patients signed the Informed Consent Form.

Patients with BMI between 25 and 29.9 were considered overweight and were excluded. In addition, severe lumbar stenosis, spondyloolisthesis, tumor, trauma, and infection were exclusion criteria.

Patients with disc herniation defined in magnetic resonance images, associated with a positive test for nerve root pressure in the physical examination, and persistent sciatic pain after more than six weeks of appropriate conservative treatment (physical therapy, analgesia, rest) were included.

Patients were assessed for clinical data for pain using the Visual Analog Scale (VAS) and in terms of functional findings by the Oswestry Disability Index (ODI). These data were obtained in the preoperative and immediate postoperative periods and at 1 month, 3 months, 6 months, and 1 year following surgery. During follow-up, the patients who evolved with persistence of or new symptoms of radicular pain underwent a new magnetic resonance examination.

A significance level of 5% (0.050) was adopted for the application of statistical tests, that is, when the significance value calculated (p) was less than 5%, a statistically significant relationship was observed, but when the p-value was greater than 5%, a so-called non-statistically significant relationship was identified. The SPSS (Statistical Package for Social Sciences) program, version 13.0, was used to obtain results. The Mann-Whitney U test was used to compare the two groups at the clinical (VAS) and functional (ODI) levels. The Wilcoxon signed rank test was applied as a complementary test to identify which moments of observation differed the most from the others.

As regards the surgical technique, the patient is positioned in a prone position on a radio-transparent table, with the hips and knees flexed, under conscious sedation. After adequate asepsis, the skin is marked assisted by fluoroscopic visualization. Then, local anesthesia is performed with 1% xylocaine without a vasoconstrictor at the established puncture site. An 18 gauge needle is introduced up to the lateral portion of the facet joint and then to the posterior surface of the annulus fibrosus, locations where additional anesthetic is applied. Discography is performed with a solution of non-iodized contrast and methylene blue. Then the guide-wire, dilator, and working cannula are introduced, followed by an endoscope with 30 degrees of angulation and continuous flow irrigation. In case of bleeding, hemostasis is performed with a bipolar coagulator. The herniated disc fragment is identified with blue coloration and delicately removed with specific tweezers. It is generally possible to observe the release of the nerve root with oscillation of the irrigation pressure. The patients are permitted to walk when they are completely recovered from the sedation.

RESULTS

A total of 56 patients were included in the study, 25 of whom were obese. In the control group, the 31 patients, 15 of whom were men and 16 of whom were women, had a mean BMI of 22.1 Kg/m² (ranging from 19.3 to 24.8). Table 1 shows the demographic and clinical data of the obese and control groups. In both groups, the disc level most affected was L4-L5, followed by L5-S1. Fifteen patients were operated at two levels, eight from the obese group and seven from the control group.

The duration of the surgical procedure and hospitalization time were not statistically different between the groups. The mean surgical time was 53 minutes in both groups and everyone was discharged within a maximum of 12 hours following discectomy.

The preoperative and postoperative follow-up clinical and functional findings of the obese and control groups can be observed in Figure 1 and Figure 2, respectively. The comparison between the obese and control groups in terms of the VAS questionnaire scores are shown in Table 2, and in terms of the ODI questionnaire scores, in Table 3.

No accidental dural lesions, neurological damage, or disc or surgical site infections were observed in any of the 56 patients. There were 3 cases of disc herniation recurrence at the same level after a period of significant improvement of symptoms, 2 of them in the obese group and 1 in the control group. Of these cases, only 1 patient (control group) required a new endoscopic discectomy. There were no conventional microdiscectomies performed for the disc herniation recurrences. Tolerable sciatic pain was observed in 5 patients (2 in the obese group and 3 in the control group) with good improvement after conservative treatment.

| Table 1. Demographic and clinical characteristics. |
| --- |
|  | Obese group | Control group |
| Number of patients | 25 | 31 |
| Age (mean) | 48.8 | 48.6 |
| Male/Female | 15/10 | 15/16 |
| Mean BMI (Kg/m²) | 33.6 | 2.1 |
| Surgical level |  |  |
| L3-L4 | 2 | 2 |
| L4-L5 | 19 | 16 |
| L5-S1 | 11 | 19 |

Figure 1. Questionnaires for the obese group during follow-up.

Figure 2. Questionnaires for the control group during follow-up.
Table 2. Visual Analog Scale Questionnaire.

|                  | Obese | Control | p*   | Obese | Control | p*   |
|------------------|-------|---------|------|-------|---------|------|
| Pre              | 5.46  | 6.32    | 0.758| 5.79  | 4.65    | 0.197|
| 1 week           | 2.46  | 2.32    | 0.754| 2.21  | 1.58    | 0.703|
| 1 month          | 2.08  | 2.45    | 0.371| 1.63  | 1.68    | 0.902|
| 3 months         | 1.96  | 2.42    | 0.443| 1.52  | 1.13    | 0.368|
| 6 months         | 2.42  | 2.06    | 0.761| 2.13  | 1.03    | 0.103|
| 12 months        | 2.21  | 2.32    | 0.771| 1.83  | 0.90    | 0.228|

p* < 0.05 = statistically significant. p** = Relationship between preoperative and 12 months.

Table 3. Oswestry Disability Index Questionnaire.

|                  | Obese | Control | p*   |
|------------------|-------|---------|------|
| Preoperative     | 19.96 | 16.57   | 0.332|
| 1 week           | 8.92  | 8.68    | 0.993|
| 1 month          | 7.13  | 7.65    | 0.225|
| 3 months         | 5.63  | 5.81    | 0.506|
| 6 months         | 6.25  | 5.65    | 0.880|
| 12 months        | 5.46  | 5.32    | 0.686|

p* < 0.05 = statistically significant. p** = Relationship between preoperative and 12 months.

DISCUSSION

Obesity is defined by the World Health Organization as a body mass index greater than or equal to 30 Kg/m² and is considered to be a public health concern. In the United States, a 2014 study reported a prevalence of 36.5% in the adult population. High BMI has been associated with a significant risk of venous thromboembolism, more serious complications, surgical site infections, increased surgical time, and significant socioeconomic impact. Several studies have associated obesity and being overweight with lumbar pain, demonstrating its active role in the pathogenesis of disc degeneration. Some authors also have identified obesity as a predisposing factor for sciatica, increasing the probability of hospitalization and herniated lumbar disc surgery.

Although the worldwide clinical findings in obese patients following lumbar spine surgery are similar to those of the population at a normal weight, the incidence of complications following conventional spine surgery is generally higher in obese patients. Spinal decompression surgery reportedly has a 50% complication rate in morbidly obese individuals. This increase in the complication rates can be attributed to the technical difficulties associated with a deep surgical field, resulting in longer procedure times, a higher risk of contamination, and greater trauma to the paravertebral musculature. Dehiscence of the surgical wound is more often observed in obese patients, probably due to the increased pressure of the margins of the wound at the time of suturing and/or the existence of a hematoma or seroma.

Obese patients can benefit significantly from spinal surgery, especially using a minimally invasive technique. These techniques provide a beneficial alternative for obese patients, minimizing postoperative complications.

Three studies have reported the results from endoscopic transfemoral lumbar discectomy in obese patients. In 2016, Bae and Less conducted a retrospective study of 21 obese patients and 27 patients with normal BMI and observed similar VAS and ODI results. In both groups there was significant reduction in these parameters after two years of postoperative follow-up.

CONCLUSION

Endoscopic transfemoral lumbar discectomy has proven to be a safe, effective, and minimally invasive alternative for the treatment of lumbar disc herniation in obese patients, with the advantages of significantly reduced damage to the soft tissues, shorter surgical time, and a lower rate of complications.

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