

QUALITY OF LIFE IN SYMPTOMATIC CERVICAL MYELOPATHY AFTER OPEN-DOOR LAMINOPLASTY

QUALIDADE DE VIDA NA MIELOPATIA CERVICAL SINTOMÁTICA APÓS UMA LAMINOPLASTIA OPEN-DOOR

CALIDAD DE VIDA EN MIELOPATÍA CERVICAL SINTOMÁTICA DESPUÉS DE UNA LAMINOPLASTIA DE PUERTAS ABIERTAS

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ABSTRACT

Objective: To analyze the results obtained by open-door laminoplasty using the Newbridge®/Blackstone plate, in cases of myelopathy associated with cervical lordosis. **Methods:** From December 2010 to October 2012, eight patients between the ages of 49 and 68 underwent open-door laminoplasty with the use of the Newbridge® fixation system for maintenance and stabilization of the cervical laminoplasty. Minimum follow-up was four months. For the evaluation of quality of life the questionnaire SF-36 was applied at the following times: preoperative, one month and three months after surgery associated with the subjective assessment of the patient regarding satisfaction with the procedure and with the Nurick neurological scale applied prior to surgery and three months later. **Results:** According to the SF-36, there was significant improvement in the domains functional ability, general health perceptions and emotional aspects over time; regarding physical limitations and social aspects there was no improvement in the first postoperative month, only in the third month. There were no statistically significant changes observed during the period covered by this study related to pain, vitality and mental health. According to Nurick scale, there was evidence of improvement in symptoms of cervical myelopathy. Based on the subjective evaluation of the patients, surprisingly, all patients were satisfied with the surgical procedure and the results. **Conclusion:** The open-door laminoplasty technique with rigid fixation to maintain the opening is useful in improving the symptoms of cervical myelopathy associated with lordosis, leading to improved quality of life and with a high degree of patient satisfaction and fewer complications.

Keywords: Spinal cord diseases; Laminoplasty; Spine/surgery; Quality of life.

RESUMO

Objetivo: Analisar os resultados obtidos pela laminoplastia open-door com o uso da placa Newbridge®/Blackstone, em casos de mielopatia com lordose cervical associada. **Métodos:** Entre dezembro de 2010 e outubro de 2012, oito pacientes entre as idades de 49 e 68 foram submetidos a laminoplastia open-door com o uso do sistema de fixação Newbridge® para manutenção e estabilização da laminoplastia cervical. O seguimento mínimo foi de quatro meses. Para a avaliação da qualidade de vida, o questionário SF-36 foi aplicado nos seguintes tempos: pré-operatório, um e três meses após a cirurgia, associado à avaliação subjetiva do paciente quanto à satisfação com o procedimento e à escala neurológica de Nurick aplicadas antes da cirurgia e três meses depois. **Resultados:** De acordo com o SF-36, houve melhora significativa nos domínios capacidade funcional, estado geral de saúde e aspectos emocionais ao longo do tempo; com relação às limitações físicas e aos aspectos sociais, não houve melhora no primeiro mês pós-operatório, apenas no terceiro mês. Não foram observadas alterações estatisticamente significativas, durante o período abrangido por este estudo de dor, vitalidade e saúde mental. De acordo com a escala de Nurick, houve evidências de melhoria nos sintomas da mielopatia cervical. Com base na avaliação subjetiva dos pacientes, surpreendentemente, todos os pacientes ficaram satisfeitos com o procedimento cirúrgico e com os resultados. **Conclusão:** A técnica de laminoplastia open-door com fixação rígida para manter a abertura é útil para melhorar os sintomas de mielopatia cervical com lordose associada, levando à melhora da qualidade de vida, com alto grau de satisfação dos pacientes e poucas complicações.

Descritores: Doenças da medula espinal; Laminoplastia; Coluna vertebral/cirurgia; Qualidade de vida.

RESUMEN

Objetivo: Analizar los resultados obtenidos por laminoplastia de puertas abiertas utilizando la placa Newbridge®/Blackstone, en casos de mielopatía con lordosis cervical asociada. **Métodos:** Entre diciembre de 2010 y octubre de 2012, ocho pacientes con edades de 49 a 68 años se sometieron a laminoplastia de puertas abiertas mediante el sistema de fijación Newbridge® para el mantenimiento y la estabilización de la laminoplastia cervical. El seguimiento mínimo fue de cuatro meses. Para la evaluación de la calidad de vida, el cuestionario SF-36 se aplicó en los siguientes tiempos: preoperatorio, un mes y tres meses después de la cirugía, asociado con la evaluación subjetiva del paciente con respecto a la satisfacción con el procedimiento y la escala neurológica Nurick aplicada antes de la cirugía y tres meses más tarde. **Resultados:** De acuerdo con el SF-36, hubo una mejora significativa en las áreas de función física, salud general y los aspectos emocionales a través del tiempo; con respecto a las limitaciones físicas y aspectos sociales, no hubo mejoría en el primer mes postoperatorio, sólo en el tercer mes. Estadísticamente no se observaron cambios significativos durante el período cubierto por este estudio en las áreas de dolor, vitalidad y salud mental. De acuerdo con la escala Nurick, hubo evidencia de mejoría en los síntomas de mielopatía cervical. Con base en la evaluación subjetiva de los pacientes, de forma sorprendente, todos los pacientes se mostraron satisfechos con el procedimiento quirúrgico y los resultados. **Conclusión:** La técnica de laminoplastia de puertas abiertas con fijación rígida para mantener la apertura es útil en la mejora de los síntomas de la mielopatía cervical asociado con lordosis, dando lugar a una mejor calidad de vida con un alto grado de satisfacción del paciente y menos complicaciones.

Descriptores: Enfermedades de la médula espinal; Laminoplastia; Columna vertebral/cirugía; Calidad de vida.

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INTRODUCTION

Stenosis is narrowing of the vertebral canal, as a result of combinations of cervical discopathy, instability and spondylosis, leading to mechanical and vascular pressure. It presents as a radiculopathy and/or myelopathy.^{1,2} The lesion starts with a disc prolapse that invades the canal, with the formation of osteophytes and ligament hypertrophy, resulting in circumferential narrowing of the canal. This narrowing of the canal may be central, when it leads to myelopathy, or in the lateral recess or foramina, leading to radiculopathy. Both can exist together, in mixed form.^{2,3}

Surgical treatment is indicated in patients with persistent pain or progressive symptoms of radiculopathy or myelopathy.² Among the various surgical techniques performed, the anterior or posterior approach may be used.⁴⁻⁶

The anterior approach consists of bone marrow decompression by corpectomy associated with arthrodesis. This approach is feasible and safe for interventions involving up to three segments, although it may lead to early degenerative changes in the segments adjacent to the fusion.^{2,4-6} When used on three or more segments, the level of pseudoarthrosis and migration of the graft increases.⁵ The traditional posterior approach, in these cases is isolated laminectomy by the posterior route, which, despite promoting decompression, is associated with postoperative instability, kyphotic deformity, and the formation of significant postlaminectomy scarring.⁴⁻⁶

The purpose of the laminoplasty described Hirabayashi in 1978,^{7,8} and its variations, is to increase the diameter of the vertebral canal, with consequent decompression and reconstruction of the posterior arch, without removing the laminae, thereby avoiding the usual complications associated with laminectomy.⁴⁻⁸

The aim of this study was to evaluate the results on quality of life obtained by cervical laminoplasty with the open-door technique, using the Newbrigde®/Blackstone plate (Orthofix - USA).

PATIENTS AND METHODS

This prospective study was conducted in the period December 2010 to October 2012, with eight patients with cervical myelopathy. Of these, five had locomotor incapacity, requiring the use of a walking aid or assistance from people, to walk. Five were male and three were female. Their ages ranged from 49 to 68 years, with an average of 58.5 years.

The average time, from the onset of symptoms to the procedure itself, after making surgical decision, was 8.5 months (6 to 18 months). In relation to symptoms, the most frequent complaint reported by the patients was neck pain, irradiating to the upper limbs. The preoperative data on the patients of this study are shown in Table 1.

The criteria for surgical inclusion of patients were: progressive worsening of the neurological condition; myelopathy of recent evolution; radiculopathy without improvement after conservative treatment; and the presence of cervical lordosis. (Figure 1)

For the evaluation of quality of life, we used the following instruments: The short form questionnaire 36 (SF-36) was applied at the following times: preoperative, one month and three months after surgery, associated with subjective evaluation of the patients and

with the Nurick myelopathy scale, in the periods before surgery and three months after surgery.

The research project was evaluated and approved by the in-house Research Ethics Committee. All the patients signed a Voluntary Informed Consent Form, in accordance with resolution 196/96 of the Conselho Nacional de Saúde [National Health Council].

Surgical Technique

The patients were operated on under general anesthesia, in the prone position, with the head in a Mayfield headrest to keep cervical spine in a neutral position. A partial opening was made, to perform the breakdown/rupture on one side, and on the other side, a complete opening was made to open the canal. After performing laminoplasty, it was fixed with a plate, to maintain the opening (Figure 2).

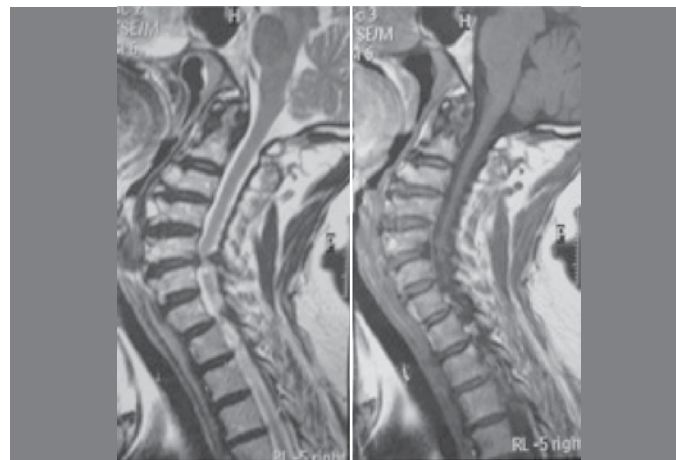


Figure 1. MRI image in T2 and T1 with cervical lordoses and the presence of myelopathy.

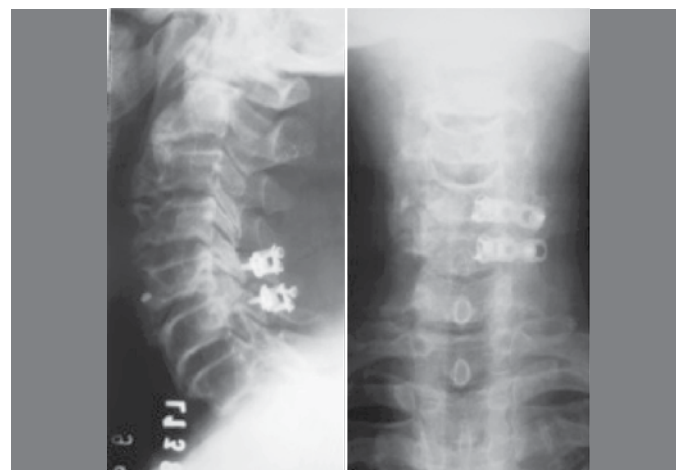


Figure 2. Postoperative control x-ray with fixation with plate and screws.

Table 1. Epidemiological data of the patients.

Sample	Sex	Age	Level most affected	Time from start of symptoms and waiting for surgery	Main symptoms
1	Male	51	C4/5	12 months	Myelopathy + radiculopathy + difficulty walking
2	Male	70	C5/6 and C6/7	8 months	Myelopathy + radiculopathy + difficulty walking
3	Female	70	C5/6 and C6/7	18 months	Myelopathy + radiculopathy + difficulty walking
4	Male	57	C5/6 and C6/7	7 months	Myelopathy + radiculopathy + difficulty walking
5	Male	57	C5/6 and C6/7	6 months	Myelopathy + radiculopathy + difficulty walking
6	Male	56	C5/6	7 months	Myelopathy + radiculopathy
7	Female	67	C5/6 and C6/7	6 months	Radiculopathy
8	Male	49	C5/6 and C6/7	6 months	Radiculopathy

RESULTS

The follow-up time was 4 to 6 months. We observed the following complications: three patients presented skin infection and one patient presented a tear of the dural sac during the surgical intervention, which was repaired immediately using fibrin glue and grafting from the adjacent musculature.

In relation to the criteria adopted, the following results were obtained:

1. Regarding the patients' quality of life, based on the questionnaire SF-36: The result of the patient evaluation by the questionnaire SF-36, presenting the results by domain, according to the patients' opinions, at three separate times: preoperative, one month and three months after surgery. (Table 2) It was found, using this instrument, that according to the Wilcoxon Signed Rank-Sum Test, the functional capacity, general state and emotional aspects showed a significant improvement over time, while for the domains functional limitation and social aspect, we did not find any improvement in the first month after surgery, only in the third month.
2. In regard to the domains pain, vitality and mental health, these did not present statistical evidence of significant demonstrable improvements over the study period. The results were obtained by evaluation according to the Nurick myelopathy scale, used for physical evaluation of the patients before, and three months after surgery (Table 3).
Through this instrument, we were able to observe that all the patients presented significant improvement. The five patients who required walking assistance were the ones who achieved scores higher than three. After the surgery, only one patient still required this type of assistance.
- 3) In regard to the patients' subjective evaluation: the patients' subjective evaluation was obtained by asking the patients just two,

Tabela 2. Pontuação média dos domínios SF36 em três momentos: Pré-operatório, 1,3 meses após a cirurgia.

	Preoperative	1 month after	3 months after
Functional capacity	13.13	49.25	66.25
Functional limitation	0	18.75	62.50
Pain	29.63	52.75	69.88
General state	36.25	48.13	53.13
Vitality	41.88	55	68.13
Social aspects	54.38	59	77.88
Emotional aspects	8.25	16.63	70.75
Mental health	50.5	58.5	66.5

Table 3. Analysis before and after surgery, by the Nurick classification.

Data Sample	NURICK	
	Before	After
1	3	1
2	3	2
3	4	3
4	3	1
5	4	2
6	2	1
7	2	0
8	2	0

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simple questions, three months after the surgical correction:

- Are you satisfied with the surgery, would you have it done again?
- Would you recommend the surgery to other patients who need this surgery?

All the patients responded in the affirmative, and were satisfied with the surgical procedure.

DISCUSSION

Since it was first described by Hirabayashi^{7,8} in 1978, laminoplasty has provided an option for treatment of cervical spondylosis. This procedure is currently indicated in cases of multisegment compression, particularly of more than three levels, posterior compression, or in the presence of calcification of the posterior longitudinal ligament.⁵

This study of laminoplasty demonstrates, through the SF-36 quality of life questionnaire: the domains functional capacity, general state, emotional aspects, functional limitation, and social aspects presented statistical improvement, but the domains pain, mental health and vitality did not present a significant variation over time. The same result was obtained by Manzono *et al.*,⁹ who compare cervical laminoplasty with laminectomy, demonstrating that in cervical decompression by laminoplasty, the patients presented an improvement in quality of life, but complained of neck pain, spreading to the axial region and scalp, as the most common symptoms.^{2,9,10}

According to the Nurick classification, an unconditional improvement was also noted in all the patients. Four patients, who in our study required special assistance to walk, no longer required a walking stick or walking frame; only one patient still required help with walking, possibly due to the longer time since the start of symptoms, and the delay in deciding to undergo surgery. The authors agree that the longer the patient's history, the worse the prognosis will be. Surgical treatment is therefore indicated in the first year after the start of symptoms.^{2,11}

A similar study to ours was described by Andrade *et al.*,⁵ in which 24 patients were submitted to expansive laminoplasty according to the Nurick scale. Of the 24 patients, three continued to be unstable, one patient died immediately after surgery, and the 20 remaining patients improved, according to the Nurick scale, with a six-month follow-up.⁵

Regarding the patients' subjective evaluation, our results are better than those presented in the literature, with 100% patient satisfaction, compared with the average of 70% presented in the literature.²

CONCLUSION

Despite the small number of cases in our series, the cervical laminoplasty technique with the Newbridge plate[®] was useful in the treatment of lordotic cervical myelopathy, promoting an improvement in quality of life of patients, associated with a low rate of complications.

All authors declare no potential conflict of interest concerning this article.

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