

Post-Operative Complications in Patients Older than 60 Years Old with Lumbar Stenosis after Spinal Decompressive Surgery

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Abstract

Background Data: Morbidity and mortality tend to increase with advancing in age, surgical interference and its outcome may be influenced by age. In elderly stenotic canal decompressive surgery outcome is affected by age.

Purpose: To assess complications in patients older than 60 years old with lumbar canal stenosis after spinal decompressive surgery.

Study Design: This is a retrospective clinical case study.

Patients and Methods: All postoperative complications of patients with spinal canal stenosis older than 60 years old who went through spinal decompressive surgery were reviewed and evaluated using the Charlson Weighted Index. Fifty-five patients treated between 2004 and 2010 were evaluated for postoperative complications. Forty-five percent were women and fifty five percent were men. The follow-up period averaged 12 months.

Results: Back pain was present preoperatively in 88%; after surgery, 43% experienced complete relief and 33% partial improvement while 24% with no improvement (Figure 4). Leg pain was present preoperatively in 98%; after surgery 43% experienced complete relief and 42% partial improvement. Wound complications and systemic complications, were demonstrated in 24 and 16 patients, respectively. There was no mortality. The number of laminectomy levels was not predictive of complications. Length of operative time ($p=0.003$) and the Charlson Weighted Comorbidity Index score ($p=0.088$) were associated with both systemic and wound complications denoting a predictive index for complications.

Conclusion: Spinal decompressive surgery in patients older than age 60 years with stenotic canal can be safe with outcomes rates as in younger patients. The Charlson Weighted Comorbidity Index score and operative time were predictive of the risk of complications. (2013ESJ038)

Keywords: Spinal decompression, Lumbar stenosis, Complications.

Introduction

Surgical problems increase with advancing in age. For neurological surgeons this demographic trend will be significant for two reasons; first, an aging population will result in an

increased incidence in age-related diseases such as lumbar spinal stenosis. Second, operative intervention in this population carries additional risks.

Because the underlying disease of lumbar spinal stenosis progresses with

advancing age, several authors^{2,8,9} have examined the surgery-related risks in this high-risk population. In many of these studies lumbar surgery in the elderly was found to carry a higher but acceptable risk of perioperative complications. In the study reported by Quigley, et al,¹³ of 143 patients age 70 years and older, fewer than 7% were found to have suffered a major complication.

In a study of lumbar surgery in patients older than 70 years of age, 85% of whom underwent a posterolateral fusion; one group reported a serious complication rate of 12% and perioperative mortality of 1.4%.² the authors of other studies have also found increased morbidity and mortality rates associated with spinal fusion. In addition, fusion procedures in the elderly are complicated by higher rates of osseous non-union due to decreased bone metabolism, collagen production, and alkaline phosphatase synthesis.^{10,11,12}

Our study is conducted to evaluate factors that might be predictive of systemic and wound complications due to spinal stenosis decompressive surgery in elderly population.

Patients and Methods

We retrospectively reviewed cases of lumbar spinal stenosis in patients of 60 years of age or older treated with decompressive surgery. Fifty-five cases were found between 2004 through 2010. Age ranged from 60 to 73 years (mean 66.5 years), and 45% of patients were women. Spinal stenosis was diagnosed by Magnetic Resonance Imaging in all cases and found to be concordant with the patient's symptoms. Candidates for surgery included those in whom conservative treatment had failed, including physical therapy, brace therapy, and medical management.

All patients underwent a midline decompressive laminectomy with foraminotomies at the affected levels. Ambulatory function was rated on a four-point scale (4, independently ambulatory; 3, requiring a cane; 2, requiring a walker; and 1, wheelchair bound). Pain was identified as either axial or radicular in nature and classified as worse, unchanged, improved, or completely resolved following surgery. Intraoperative blood loss was calculated, age, operative time, Charlson Comorbidity Index score (Table 1), and the number of treated levels were assessed as predictive factors for perioperative complications Charlson et al,³ Complications were identified and classified as

wound related, cerebrospinal fluid leak, neurological, or systemic. Statistical analysis was performed using a one-tailed t-test with un-paired variance. The number of patients as to the age is shown in (Figure 1), the number of laminectomy-treated levels ranged from one to three levels. (Figure 2) The mean Charlson Comorbidity Index score was 1.19 (Figure 3). The mean length of stay in acute care was 6.22.1± days, (range 5.5-8.5). Patients were discharged home (20%) or to acute rehabilitation (80%). The mean follow-up period was 12 months. Mild lumbar degenerative scoliosis was present in 9 patients (16.4%) and moderate-to-severe scoliosis was demonstrated in 9 patients (16.4%) and lumbar kyphosis in three patients (5.4%). Eleven patients were smokers (20%). The mean operative time was 105 (range 85-145) minutes.

Improvement in Symptoms:

Of the 49 (89%) of patients who suffered back pain preoperatively, 43% experienced complete relief, while 33% partial improvement and 24% no improvement after surgery (Figure 4). Of the 54 (98%) of patients with leg pain preoperatively, 43% experienced complete relief, 42% partial improvement, and 15% no improvement after surgery. Of the 33 (60%) patients with preoperative gait disturbances requiring assistive devices, status in 61.8% improved at least one point on the ambulatory scale, in 34.5% it was unchanged, and in two patients (3.6%) status worsened by one point on the ambulatory scale (Figure 5).

Procedure-Related Complications:

There were no perioperative deaths. Twelve patients (21.8%) suffered wound complications, 8 a dural tear (14.5%). Eight patients (14.5%) experienced increased leg numbness in a radicular distribution. Comparisons between data in patients with and without complications revealed no significant differences in age ($P=0.312$), or the number of laminectomy levels ($P=0.224$) in relation to postoperative complications. In relation to the complications (Table 2), our results confirm that surgery in this population carries relatively high rates of systemic and wound complications (18 and 14%, respectively). The length of operative time revealed a high significance regarding systemic complications and wound complications ($P=0.004$) and the Charlson Weighted Comorbidity Index score also was associated with both systemic and wound complications and was highly significant ($P=0.098$).

Table 1. Charlson Comorbidity Index.

Comorbidity	Relative Weight Assignment
metastatic solid tumor	6
AIDS	6
moderate-to-severe liver disease	3
hemiplegia	2
moderate-to-severe renal failure	2
diabetes w/ end organ damage	2
neoplasia	2
leukemia/lymphoma	2
myocardial infarct	1
congestive heart failure	1
peripheral vascular disease	1
cerebrovascular disease	1
dementia	1
chronic pulmonary disease	1
connective tissue disease	1
ulcer disease	1
mild liver disease	1
Diabetes	1

* The total score is obtained by adding the relative weight of each co-morbidity³

Table 2. Summary of Systemic Complications.

Complication	No. of Cases	% of total No.
myocardial infarction	2	3.6%
new onset arrhythmia	2	3.6%
deep venous thrombosis	3	5.4%
severe hypotension	4	7.2%
transient renal failure	1	1.8%
exacerbation of congestive heart failure	1	1.8%
severe hyperglycemia from uncontrolled diabetes	3	5.4%
Total	16	29%

Figure 1. Age groups in relation to number of patients.

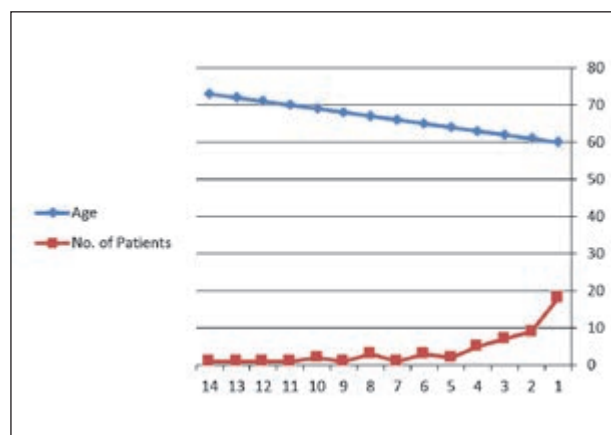


Figure 2. Description of operated disc levels.

1= single level patients (N=44),
2= double level patients (N=9),
3= 2 three levels patients (N=2).

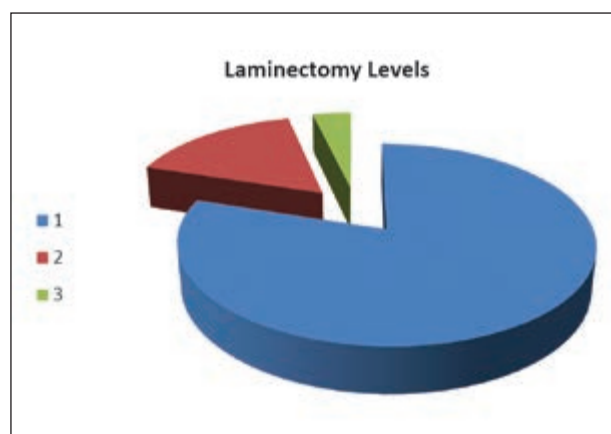


Figure 3. Comorbidity index in study patients.

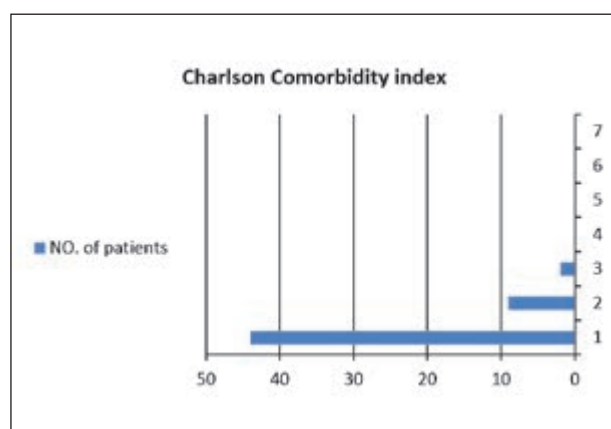
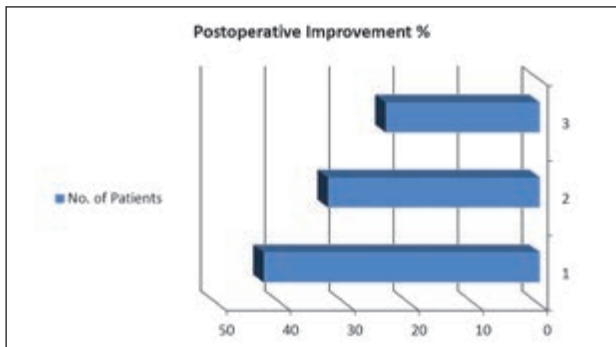


Figure 4. Postoperative Patients overall improvement. 1= Complete relief percentage 43%, 2= Partial improvement percentage 33%, 3= No improvement percentage 24%



Discussion

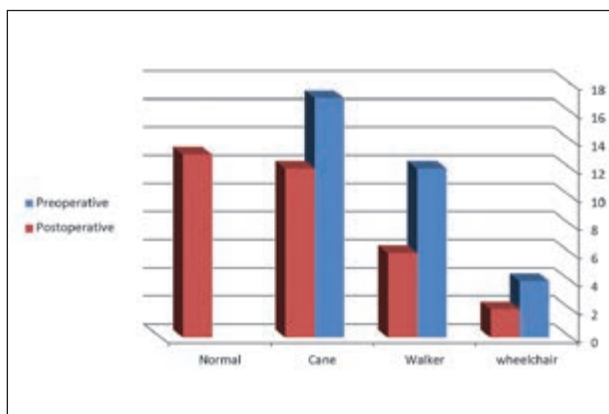
Surgical management of lumbar spinal stenosis by decompressive surgeries can produce marked improvement in neurological status in elderly patients. It leads to marked improvements in pain, ambulation, and the activities of daily living. The symptoms of spinal stenosis alone can be disabling, leading to physical deconditioning, loss of lean body mass, decreased cardiac and pulmonary functions, and depression.¹⁵ Surgeons evaluating these patients must thus weigh the potential benefits of surgery against substantial medical comorbidities.

Our results confirm that surgery in this population carries relatively high rates of systemic and wound complications (18 and 14%, respectively). This is similar to the findings by Deyo, et al,^{5,6} who demonstrated an 18% complication rate in this same age group. Similarly, the number of laminectomy levels was not independently associated with complications. Operative time and the Charlson Comorbidity score were, as expected, predictive of complications.

Symptomatic improvement rates for leg and back pain in this study were similar to those reported in other studies in younger cohorts. Improvements in ambulation were also demonstrated at rates similar to those in younger patients.^{9,7,13,15}

The increased risks of surgery must be discussed with the patient in the context of predicted functional gains. The strategies used in an attempt to minimize perioperative complications in all cases in which substantial blood loss is expected accurate accounts of intraoperative blood loss should be done and replaced. For more time-consuming surgeries in the prone position, particularly in diabetic patients, a

Figure 5. Ambulatory Status No of patients pre and postoperative.



Mayfield skull clamp is applied to minimize increases in intraocular pressure and venous congestion that may disturb retinal perfusion.⁴

Maintenance of normal blood pressure is also essential for ocular perfusion. These measures are believed to minimize the uncommon but disastrous complication of postoperative blindness. In all cases careful coordination with the anesthesiologist is obviously essential. Postoperatively, careful management of pain medications is necessary. We use analgesic medication with age and weight-adjusted doses to minimize the risk of accidental overdosing. Finally, close coordination with inpatient rehabilitation is critical because a large number of these patients are quickly deconditioned after surgery and will require a short but intensive course of physical and occupational therapy to return to their normal activity level.

Conclusion

Lumbar stenosis decompressive surgery in patients older than 60 years of age can result in symptomatic improvement at rates similar to those in younger patients. The perioperative morbidity rate is higher than in younger patients and can be predicted by longer operative time and comorbidity indices.

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الملخص العربي

مضاعفات ما بعد الجراحة في المرضى من كبار السن من ٦٠ سنة مع ضيق القناة الشوكية القطنية بعد جراحة توسيع العمود الفقري خلفية البيانات: معدلات المراضة والوفيات تميل إلى الزيادة مع التقدم في السن، وقد يتأثر التدخل الجراحي ونتائجه حسب العمر. في كبار السن جراحة توسيع القناة الشوكية تتأثر نتائجها بعد العملية الجراحية حسب العمر الغرض: تقييم المضاعفات في المرضى من كبار السن أكبر من ٦٠ سنة مع ضيق القناة الشوكية بعد جراحة توسيع العمود الفقري.

تصميم الدراسة: هذه هي الدراسة السريرية بأثر رجعي.

المرضى والأساليب: استعرضت جميع مضاعفات ما بعد الجراحة من المرضى الذين يعانون من ضيق القناة الشوكية أقدم من ٦٠ سنة الذين أجروا جراحة توسيع العمود الفقري وتقييمها باستخدام المؤشر الوزني شارلسون وجرى تقييم خمسة وخمسين مريضاً في الفترة بين عامي ٢٠٠٤ و ٢٠١٠ لمضاعفات ما بعد الجراحة. خمسة وأربعين في المئة من النساء وخمسة وخمسون في المئة من الرجال. وبلغ متوسط فترة المتابعة ١٢ شهراً. النتائج: كانت آلام الظهر قبل الجراحة في ٨٨٪، وشهدت ٤٣٪ تحسن كامل وتحسن جزئي ٣٣٪ بينما ٢٤٪ مع أي تحسن. كان ألم الساق قبل الجراحة في الوقت الحاضر ٩٨٪، وبعد الجراحة شهدت ٤٣٪ إعفاءات كاملة وتحسن جزئي ٤٢٪. وقد أثبتت مضاعفات الجرح ومضاعفات جهازية، في ٢٤ و ١٦ مريضاً، على التوالي. لم تكن هناك وفيات. ارتبط طول الوقت الجراحي ($P = 0.003$) والاعتلال المشترك حسب نقاط مؤشر شارلسون مع المضاعفات العامة على حد سواء والجراحية تدل على مؤشر التنبؤية للمضاعفات.

الخلاصة: جراحة توسيع العمود الفقري في المرضى من كبار السن من سن ٦٠ عاماً مع ضيق القناة الشوكية يمكن أن يكون آمناً مع معدلات النتائج كما هو الحال في المرضى الأصغر سناً. كان مؤشر شارلسون للاعتلال المشترك والوقت الجراحي متنبأت عوامل الخطورة لمشاكل ما بعد الجراحة.