

Surgical Treatment of Lumbar Spinal Stenosis in Geriatric Population : Is It Risky?

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Objective : Lumbar spinal stenosis is increasingly recognized as a common cause of low back pain in elderly patients. Conservative treatment has been initially applied to elderly patients, however, surgical treatment is sometimes indispensable to relieve severe pain. We retrospectively examine the age-related effects on the surgical risk, and results following general anesthesia and operative procedure in geriatric patients for two different age groups of at least 65years old.

Methods : Consecutive 51patients (≥ 65 years), who underwent open surgical procedure for degenerative lumbar spinal stenosis, were selected in the study. Patients were divided into two groups. Group A included all patients who were between 65 and 69years of age at the time of surgery. Group B included all patients who were at least 70years of age at the time of surgery. We reviewed medical history including preoperative American Society of Anesthesiologists(ASA) classification of physical status, anesthetic risk factor, operative time, estimated blood loss, transfusion requirements, hospital stay, operated level, and clinical outcome to look for comparisons between two age groups (65~69 and over 70years).

Results : In preoperative evaluation, mean anesthetic risk factor of patients was numerically similar between the groups. The American Society of Anesthesiologists classification of physical status was similar between two groups. There was no difference in operated level, operative time, estimated blood loss, hospital stay, and anesthetic risk factor between the two groups. The clinical successful outcome showed 82.7% for Group A and 81.8% for group B. The overall postoperative complication rates were similar for both group A and B.

Conclusion : We conclude that advanced age per se, did not increase the associated morbidity and mortality in surgical decompression for spinal stenosis.

KEY WORDS : Lumbar · Spinal stenosis · Geriatric population · Operative risk.

Introduction

Lumbar spinal stenosis is increasingly recognized as a common cause of low back pain in elderly patients, due to the increase of human longevity. The severity of symptoms ranges from mild pain radiating into the buttock area with intermittent claudication to paraplegia. Although, conservative treatment has been initially applied to elderly patients, surgical treatment is sometimes indispensable to relieve severe pain and to prevent neurologic deficit. However, because of coexisting surgical risk factor such as heart disease, chronic pulmonary disease, rheumatoid arthritis, or osteoarthritis, many surgeons hesitate to make a decision of operation especially for geriatric populations with age over 70years old^{10,14}. The controversy also lies in the method or approach for treating

lumbar spinal stenosis in a population of patients with comorbid conditions resulting from the aging process in other systems. The purpose of the current study was to document associated morbidity, operative and general anesthetic risk factor for a consecutive series of decompressive surgeries in patients 70years of age or older with the diagnosis of lumbar spinal stenosis. We retrospectively examined the age-related effects on the surgical risk, and the results following general anesthesia and operative procedure in geriatric patients for 2 different age groups of at least 65years old.

Materials and Methods

Consecutive 51patients (≥ 65 years), who underwent open surgical procedure for degenerative lumbar spinal

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stenosis during Jan 2002 to Dec 2002, were selected in the study. Only patients with lumbar spinal stenosis secondary to degenerative spondylosis were included. In our study groups, low back and radicular pain as well as neurological deficit were the clinical indications for surgical intervention. Three spine surgeons shared the spine operations, which were performed through a posterior approach. Laminectomies were performed at stenotic levels. Discectomy was performed, when protrusive disc showed a significant impediment in the stenosis. In cases of significant segmental instability or facetectomy, spinal fusion using pedicle screw and interbody cage was performed.

To investigate the age-related effects on results and the risks of spinal surgery, patients were divided into two groups. Group A included all patients who were between 65 and 69 years of age at the time of surgery. Group B included all patients who were at least 70 years of age at the time of surgery.

We investigated the medical history including preoperative American Society of Anesthesiologists(ASA) classification of physical status, anesthetic risk factor, operative time, estimated blood loss and transfusion requirements, medical and surgical complications related to surgery, length of hospital stay, operated level to compare between the two age groups. Patient anesthesia records were reviewed for ASA staging as well as estimated blood loss and transfusion requirements(Table 1). Intraoperative events and complications in addition to immediate postoperative complications related to surgery were also reviewed.

Clinical outcome was evaluated at postoperative 1 month using Macnab's classification²⁾ and compared between two age groups (Table 2).

Table 1. The American Society of Anesthesiologists(ASA) classification of physical status

Class	Definition
I	No systemic disease
II	Mild to moderate systemic disease
III	Severe systemic disease
IV	Severe systemic disease that is life threatening
V	Moribund patient with little chance of survival

Table 2. Macnab's classification for the evaluation of clinical outcome in patients treated for degenerative spinal disease

Classification	Criteria
Excellent	No pain : no restriction of activity occasional back pain or leg pain of sufficient severity to interfere with the patient's ability to do normal work or capacity to enjoy leisure hours
Good	Improved functional capacity, but handicapped by intermittent pain of sufficient severity to curtail or modify work or leisure activity
Fair	No improvement or insufficient improvement to enable
Poor	Increase in activities, further operative intervention required

Results

Total 51 cases (Group A : 29 cases, Group B : 22 cases) were analyzed and reviewed by medical records. In Group A and B, the mean age at operation was 67.8 years and 74.7 years, respectively.

In preoperative evaluation, mean anesthetic risk factor of patients was numerically similar between the groups (1.1 and 1.2 for Group A and Group B, respectively). The American Society of Anesthesiologists(ASA) classification of physical status was not different between the two groups (Group A : 18 patients ASA Class II and 11 patients ASA Class III, Group B : 12 patients ASA Class II and 10 patients ASA Class III).

In operation, mean decompressive laminectomy level, mean operative time, estimated blood loss and transfusion requirements of each groups were not significantly different (Table 3). The clinically successful outcome including excellent results and good results of each group showed 82.7% for Group A and 81.8% for group B.

The overall postoperative complication rates were similar for both Group A and B (10.3% vs. 9.1%, respectively). The overall postoperative complications were urinary retention, wound infection, cerebrospinal fluid leakage, epidural hematoma. All complications responded to appropriate therapy. None of the cases with complications resulted in prolonged hospitalization. There were no mortalities or thromboembolic events in the study population. The mean hospital stay was 15.2 days (range : 9~19) and 13.9 days (range : 10~16) for Groups A and B, respectively.

There was no difference numerically in anesthetic risk factor, operated level, operative time, estimated blood loss, hospital stay and clinical outcome between two geriatric population groups.

Discussion

Ageing of the lumbar spine is a physiologic process resulting in degenerative changes, leading to lumbar spinal stenosis^{2,14,17)}. Back and leg pain resulting from nerve root

Table 3. Surgical and anesthetic data in patients treated for degenerative spinal disease

	Group A (age : 65~69)	Group B (age ≥ 70)
ASA - physical status(I / II / III)	0/18/11	0/12/10
Mean anesthetic risk factor	1.1	1.2
Mean operative time (min)	197	188
Mean level of decompressed	2.1	2.1
Estimated blood loss (cc)	908	990
Transfusion requirements (cc)	942	972
Postoperative complication rate	10.3%	9.1%
Mean hospital stay (days)	15.2	13.9

ASA : The American Society of Anesthesiologists, min : minutes

compression in elderly patients may cause loss of function and inability to perform activities that meet basic daily needs⁸⁾. Therefore, treatment of symptomatic lumbar spinal stenosis in the elderly is recommended. Many spine surgeons as well as elderly patients and their families, however, are often concerned as to the operative risk and effect of increasing age on the suitability of surgery for these high risk patients. Therefore, surgical result and surgery related morbidity are important when making a decision to surgery for the geriatric patient especially over than 70, suffering from lumbar spinal stenosis.

Many studies have mentioned the morbidity associated with surgical treatment of lumbar stenosis in the elderly population^{9,10,14)}. Deyo et al.⁴⁾ found the rate of complications after lumbar spine surgery to be 18% in patients 75years of age or older. In another study, Katz et al.¹⁸⁾ insisted that patients of elderly with greater medical comorbidity and functional disability are significantly less satisfied with the results of surgery for degenerative lumbar spinal stenosis. Other authors have noted that multiple-level arthrodesis in the presence of osteoporotic bone and advanced age may lead to significant perioperative morbidity⁵⁾. Therefore above mentioned literatures recommended nonsurgical treatment of lumbar spine stenosis in the elderly. However, due to the increase of human longevity, requisiteness for surgical treatment of lumbar spine stenosis in the elderly has been increasing. Their study also did not compare the age-related effects on the surgical risk and clinical outcome directly between different age groups.

Conversely, several authors have recommended and demonstrated favorable results after surgery for lumbar spine stenosis in the elderly population. Sanderson and Wood¹⁵⁾ reported excellent and good results in 81% of 31patients 65years of age or older. Silvers et al.¹⁶⁾ also asserted that decompressive spine surgery especially simple laminectomy is a relatively safe operation for eighth decade patients group. In present study, clinical successful outcome including excellent and good results showed 82.7% for Group A and 81.8% for group B. These current results are similar to above mentioned literature. We would persist that clinical outcome of age over 70 may be comparable to that of age under 70. However, current study could not provide the results of long term clinical outcome. Lack of long term clinical follow up may be a weak point of this study. Since the remainder of geriatric patient's life especially over than 70 may not be long, results of minimum postoperative 10years would be important to enjoy their lives without miserable pain for the rest of their days. On review of literature, Ragab et al.¹³⁾ demonstrated in their 7years long-term outcome that 108 of the 118patients with 70years of age or older were considered to have excellent or good results after spinal surgery. Herkowitz and Kurz⁶⁾ also reported the high rate of excellent or good results during 3years follow-up

for patients with a mean age of 65years after surgical treatment for degenerative spondylolisthesis. On the other hand, not all the long-term results showed satisfactory surgical results. Johnsson et al.⁷⁾ reported excellent and good results in approximately 60% of the patients with a mean age 61.3years. Postacchini et al.¹²⁾ reported excellent or good results for 67% of the patients during an average period of 8years after surgical decompression.

In terms of the surgery related risk, current study showed no difference between the two age groups. Arinzon et al.¹⁾ reported in their comparison of spinal surgery outcome in two geriatric patient populations (aged 65~74years group and >75years group) that ASA physical-status of study patients were similar between the groups. Ragab et al.¹³⁾ also mentioned that the preoperative presence of comorbidity was not a direct cause of surgical or medical complications. The surgical complications such as dural tears and wound infection or dehiscence were not a result of comorbidity.

Rate of surgical complications in present study was similar among our older patients when compared to their younger counterparts(10.3% vs. 9.1%). Benz et al.³⁾ reported that total complication rate was 40% in their chart review of patients with 70years of age or older who underwent decompressive procedures of the lumbar spine. They also mentioned that serious complications affecting quality of life occurred in 12% of patients and early mortality rate was 1.4%. Deyo et al.⁴⁾ reported in their study that complications occurred in 18% of the patients who were 75years of age or older. Silvers et al.¹⁶⁾ also reported their complication rate was 36% in patients with older than 70years after decompressive lumbar laminectomy for spinal stenosis in 258patients. According to these reports, complication of surgical decompression in old age could be more serious. Therefore surgical procedure should be undertake with punctilious care.

This study may be criticized due to its retrospective review of medical records, concerning of discrepancies between surgeon-based and patient-based outcomes. Discrepancies between surgeon and patient outcomes have been believed to result from patients reporting more favorable outcomes to please their treating physicians¹¹⁾. Therefore this medical record based retrospective study may provide more valuable results than results from direct contact method such as telephone-based interview and the questionnaire. Another weakest point of this study may be the monotonous analysis of age group as a risk factor. Because many different risk factors were existed and influenced reciprocally on each other in spine surgery, simple comparison of age would be meaningless. Although this reproachable study may be unprofitable in the point of comparison, this study would provide many spine surgeons with reassurance of decision

to operate the spinal stenosis of geriatric populations with age over 70years old.

The results of current study suggested that surgical results including postoperative complication, surgical and anesthetic risk for patients with more than 70years of age are not worse than that of patients with 65 to 69years of age, which indicated surgical decompression is a relatively safe and effective treatment option for both groups of geriatric patients.

Conclusion

The surgical results of spinal stenosis in the elderly are comparatively favourable and safe. We conclude that advanced age especially more than 70years old per se, did not increase the associated morbidity and mortality in surgical decompression for spinal stenosis. General condition seems to be more of an important factor for successful surgical management with reducing the surgical risk and complication.

In spite of this current results, since geriatric patients are more likely to suffer perioperative complications, scrupulous perioperative care should be provided.

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