

Medical Complications and Mortality in Octogenarians Undergoing Elective Spinal Surgeries

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Introduction

The consequences of suffering postoperative complications in elderly undergoing spinal surgeries may be different compared with younger patients. The primary objective of this study was to identify the types and frequency of medical perioperative complications and mortality rates in patients 80 years of age or older undergoing elective spinal surgeries for degenerative spinal disease.

Methods

A prospective observational study with a retrospective chart review was performed, which included all consecutive patients ≥ 80 years old undergoing elective spinal surgeries from May 2012 to August 2015. We identified 95 patients, 39 cervical and 56 lumbar surgeries were performed. There were 41 female and 54 male patients with the mean age of 82.8 years (range, 80 – 91) (Figure 1). Medical complications that developed during surgery or in the immediate postoperative period were reported. All complications were stratified into the following categories: infection, pulmonary, cardiac, gastrointestinal, hematologic, urologic, neurovascular, thromboembolic, and other. Mortality rates were reported as overall, 30-day, 90-day, and 1-year.

Results

The mean follow-up time was 14.8 months (range, 5 days -37 months) with the overall mortality rate of 8.4% (Figure 2). The 30-day, 90-day, and 1-year mortality rates were 2.1%, 2.1%, and 4.2%, respectively. There were 53.9% and 71.4% patients with complications in the cervical and lumbar patient groups, respectively (Figure 2).

Figure 1

	Cervical	Lumbar
N	39	56
Age	82.5 (80 – 88_)	83.0 (80 – 91)
ASA score	28 ± 0.6	28 ± 0.5
ACDF	23 (59%)	-
PCF	11 (28%)	-
ACDF + PCF	5 (13%)	-
Decompression w & w/o instrumentation	-	12 (21%)
TLIF + w & w/o addl. decompression	-	41 (73%)
ALIF/XLIF + TLIF	-	3 (6%)
EBL (mL)	148 (10 – 750)	247 (25 – 1000)
OR time (min)	157 (54 – 248)	222 (78 – 480)
LOS (days)	5.1 (0.5 – 27)	4.6 (1 – 13)

Demographic and Surgical Parameters

Figure 2

	Cervical, N=49	Lumbar, N=83
N (mean)	1.3 (0 - 6)	1.5 (0 - 9)
Pts w/complications	21 (53.9%)	40 (71.4%)
Infections	2 (5.1%)	8 (14.3%)
Pulmonary complications	13 (33.3%)	7 (12.5%)
Cardiac complications	3 (7.7%)	6 (10.7%)
Gastrointestinal complications	16 (41.0%)	5 (8.9%)
Hematologic complications	3 (7.7%)	14 (21.5%)
Neurovascular complications	1 (2.6%)	3 (5.4%)
Thromboembolic complications	2 (2.6%)	5 (8.9%)
Miscellaneous complications	6 (15.4%)	19 (29.2%)
Mortality overall	8.4%/ FU 18 mos (5 days – 37 months)	
Mortality 1-year		4.2%
Mortality 90-day		2.1%
Mortality 30-day		2.1%

Complications and Mortality

The presence of general comorbidities ($p = 0.019$; $R = 0.24$; $OR = 0.8$, 95% CI, 0.42 – 0.94) and the number of intervertebral levels ($p = 0.008$; $R = 0.27$; $OR = 1.3$, 95% CI, 0.82 – 1.89) significantly predicted the occurrence of perioperative complications. In addition, lumbar vs. cervical fusion surgery ($p = 0.08$; $R = 0.18$; $OR = 2.14$, 95% CI, 0.91 – 5.04) and BMI ($p = 0.09$; $R = 0.2$; $OR = 1.10$, 95% CI, 0.98 – 1.22) did not quite reach statistical significance

patient group. There were no statistically significant changes in clinical outcomes noted for the patients in the cervical group (Figure 3).

and only had weak relationship, however, when included in the final multivariate logistic regression model along with comorbidities and surgical levels, were predictive of the complication occurrence ($p = 0.012$; $\chi^2 = 16.25$).

The occurrence and number of complications per patient was also related to the length of hospitalization ($p < 0.0001$; $R > 0.4$; $OR < 2.03$, 95% CI, 1.42 – 2.89), which is a dependable variable. Further, patients were less likely to be discharged home if they had complications ($p = 0.04$; $R = -0.2$; $OR = 0.4$, 95% CI 0.17 – 0.97); instead they were discharged either to a nursing home or a rehabilitation facility. A longer OR time was also associated with the higher number of perioperative complications per patient ($p = 0.037$; $R = 0.22$; $OR = 1.00$, 95% CI, 0.99 – 1.01). One-third of patients undergoing cervical procedures (13 patients) developed dysphagia and two patients died due to aspiration or aspiration pneumonia. Dysphagia was a significant predictor ($p < 0.0001$; $R = 0.60$; $OR = 0.46$, 95% CI 0.22 – 0.72) in developing pneumonia or atelectasis. We encountered a high incidence of either urinary retention (10.7%) or urinary tract infections (16.1%) in the lumbar patient group. The occurrence of urinary tract infections was associated with a longer OR time ($p = 0.04$; $R = 0.38$; $OR = 1.02$, 95% CI 1.00 – 1.03). The development of anemia was related to the estimated loss of blood ($p=0.0096$; $R = 0.28$, $OR = 1.004$, 95% CI, 1.001 – high 1.007).

There was a highly statistically and clinically significant improvement observed in all clinical outcome measures, except SF-36 MCS scores in the lumbar

Figure 3

	Baseline	Post-Operative	P
Lumbar			
Back pain VAS	6.2 ± 1.6	1.6 ± 1.6	< 0.0001
Leg pain VAS	6.6 ± 3.1	1.1 ± 1.3	< 0.0001
ODI	39.9 ± 16.9	16.9 ± 12.6	0.003
SF-36 MCS	54.7 ± 8.0	58.0 ± 7.4	0.296
SF-36 PCS	27.2 ± 10.9	38.7 ± 12.5	0.026
Satisfaction		85.6 ± 21.4	
Cervical			
Neck pain VAS	4.5 ± 3.5	3.0 ± 3.8	0.449
Arm pain VAS	1.2 ± 1.5	2.6 ± 4.0	0.432
NDI	27.8 ± 19.6	29.7 ± 19.7	0.841
SF-36 MCS	48.3 ± 10.8	48.2 ± 12.0	0.989
SF-36 PCS	34.8 ± 10.7	34.0 ± 15.5	0.089
Satisfaction		81.9 ± 17.8	

Clinical Outcomes

Conclusions

The incidence of perioperative medical complications and mortality rates in octogenarians undergoing elective spinal surgeries are quite high. The benefits of having surgery must be weighed against the risks of not only surgical but also adverse medical events. An informed decision-making process should include discussion of potential postoperative morbidity specific to this patient population in order to guide patient's acceptance of higher risks and expectations postoperatively. It is also important to identify potential complications and adapt preventive measures to minimize them in this patient population.