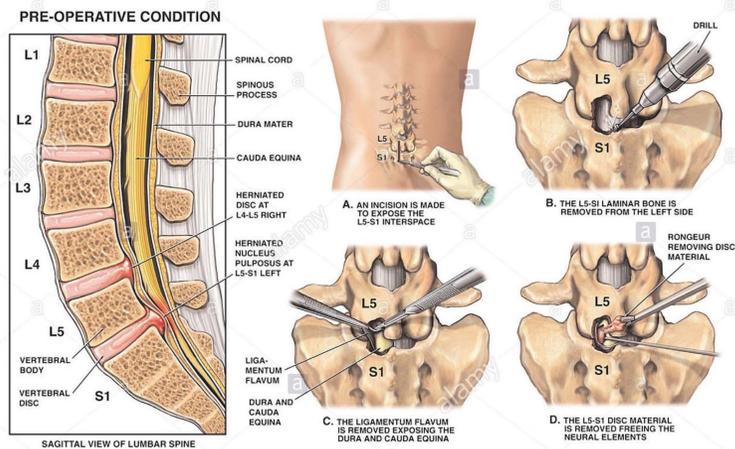


Lumbar Decompression Surgery: Does Chronic Steroid Use Increase the Risk of Postoperative Infectious Complications? – A Study of the National Surgical Quality Improvement Program (NSQIP) Database

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Introduction

- This study aims to determine differences in short-term postoperative infectious complications after undergoing lumbar decompression surgeries, comparing patients on chronic steroids VS those not on chronic steroids.
- While steroids have been linked to increased infection rates across several surgeries, little has been investigated looking at lumbar decompression surgeries predicting specific postoperative infections.



Methods

- In total, 12,601 patients were included in the analysis looking at how chronic steroid use contributes to the rates of postoperative complications in lumbar decompression surgeries.
- Data was obtained from the National Surgical Quality Improvement Project Database (NSQIP) years 2005-2014, with readmission/reoperation data beginning in 2011. Lumbar Decompression cases were selected out of the database using current procedural terminology (CPT) codes.
- Using SPSS statistical software, Univariate chi-square analysis was first done to look at demographic differences, followed by differences in infection rates. Multivariate logistic regression analyses were then performed to determine if steroid use was an independent predictor of postoperative infection.

CPT Code	Procedure
63005	Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy, or discectomy (eg, spinal stenosis), 1 or 2 vertebral segments; lumbar, except spondylolisthesis
63017	Laminectomy with exploration and/or decompression of spinal cord and/or cauda equina, without facetectomy, foraminotomy or discectomy (eg, spinal stenosis), more than 2 vertebral segments; lumbar
63030	Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc; 1 interspace, lumbar
63042	Laminotomy (hemilaminectomy), with decompression of nerve root(s), including partial facetectomy, foraminotomy and/or excision of herniated intervertebral disc, reexploration, single interspace; lumbar
63047	Laminectomy, facetectomy and foraminotomy (unilateral or bilateral with decompression of spinal cord, cauda equina and/or nerve root[s], [eg, spinal or lateral recess stenosis]), single vertebral segment; lumbar

Diagnosis Code	Diagnosis
722.10	Displacement of lumbar vertebral disc without myelopathy
722.52	Degeneration of lumbar or lumbosacral disc
724.02	Spinal stenosis, lumbar region without neurogenic claudication
724.03	Spinal stenosis, lumbar region with neurogenic claudication

Variables	No Steroid	Steroid Use	P-Value
Demographics (%)			
Age (years)	56.06	62.14	<0.001
BMI	30.26	30.51	.438
Sex (F/M)	42.8/57.2	54.4/45.6	<0.001
Medical Comorbidities (%)			
Diabetes	15.0	21.2	.001
Smoking (current or within 1 year)	20.8	12.5	<0.001
Hypertension on Medication	48.2	58.1	<0.001
Congestive Heart Failure	0.1	0.2	.219
COPD	3.0	10.0	<0.001
Renal Failure	0.0	0.0	.753
Bleeding Disorder	1.3	2.5	.043
Transfusion	0.0	0.2	.060
Disseminated Cancer	0.1	0.5	.012
White Blood Cell Count	7.55	8.46	<0.001
Sepsis Status			
None	99.5	98.8	<0.001
SIRS	0.5	1.2	
Sepsis	0.0	0.0	
Septic Shock	0.0	0.0	
Functional Status			
Independent	98.3	96.8	.024
Partially Dependent	1.5	3.2	
Totally Dependent	0.1	0.0	
Shortness of Breath			
At Rest	0.2	0.7	<0.001
Moderate Exertion	4.5	9.7	
No	95.3	89.5	

Results

- 372 out of 12,200 patients not on chronic steroids before surgery experienced some infectious complication postsurgically, for a rate of 3.05%.
- 25 out of the 401 patients on chronic steroids before surgery experienced some infectious complication postsurgically, for a rate of 6.23%.
- On multivariate analysis and after controlling for contributing comorbidities, chronic steroid use was not found to increase rates of surgical site infections.
- However, chronic steroid use was found to independently predict rates of pneumonia (OR: 3.06, p=0.030) and septic shock (OR: 3.79, p=0.008).

Variables	No Steroid Use (N = 12,200)	Steroid Use (N = 401)	P-Value
Operative Infections (%)			
Superficial Surgical Site Infection	0.7 (82)	0.7 (3)	.855
Deep Surgical Site Infection	0.5 (61)	1.0 (4)	.171
Organ Space Infection	0.1 (16)	0.0 (0)	.468
Non-Operative Infections (%)			
Pneumonia	0.3 (31)	1.2 (5)	<0.001
Urinary Tract Infection	1.0 (127)	2.0 (8)	.068
Sepsis	0.4 (46)	0.5 (2)	.697
Septic Shock	0.1 (9)	0.7 (3)	<0.001

Variables	Odds Ratio (95% CI)	P-Value
Operative Infections		
Superficial Surgical Site Infection	.957 (.296, 3.09)	.941
Deep Surgical Site Infection	1.86 (.661, 5.23)	.240
Organ Space Infection	0.00 (0.00, .)	.993
Non-Operative Infections		
Pneumonia	3.06 (1.12, 8.40)	.030
Urinary Tract Infection	1.25 (.596, 2.63)	.555
Sepsis	.992 (.231, 4.26)	.992
Septic shock	6.79 (1.66, 27.74)	.008

Discussion

- The advent of steroids offered superior anti-inflammatory control unprecedented in the medical community, but it wasn't long before the vast side effects of steroids dismissed the miracle paradox. This is the first study to specifically define infection rate for lumbar decompression surgery in NSQIP.
- Infection has been demonstrated to be a significant risk for patients on chronic steroid therapy, and the added stress of surgery may act as a catalyst for this risk. In the present study, we identified chronic steroid therapy to be associated with a moderate increase in risk of pneumonia and septic shock, with no associated increase in surgical site infection (SSI).
- Identifying complications that can arise following a lumbar decompression surgery for a patient on chronic steroids is a critical first step in targeting precise perioperative modifications to improve surgical outcomes.
- Additional research is needed to determine optimal practices for stratifying and mitigating these risks for patients.

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