

Evaluation of the Effects of Lumbar Spine Surgery on the Eye (An Exploratory Study in Iraqi Patients)

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Abstract: Background: Perioperative vision loss (POVL) linked with spinal surgery is an uncommon and severe consequence that often has no cure and has no known cause. Multiple investigations have established a direct connection between prone spine surgery and eyesight loss. **Objective:** This paper is interested to Evaluate of the effects of lumbar spine surgery on the eye (an exploratory study in Iraqi patients). **Patients and methods:** This study as show as a cross-sectional study that focuses on the evaluation of the effects of lumbar spine surgery on the eye (an exploratory study in Iraqi patients with five patients' cases. This paper is interested to conduct examinations and evaluations of all data tests before and after operation conduction to patients within ages above 55 even 65 years in different hospitals in Iraq into 16th May 2021 to 26th June 2022. Also, this paper was conducting a statistical study on data examination by the SPSS program. **Results and discussion:** This study found that Age, Sex, Greater Estimated Blood Loss, and Obesity factors had a big impact on after lumbar spine surgery. As well as this study showed that VAS scoring assessments were found VAS scoring after the operation shown higher and more perfect than VAS scoring before the operation. In the evaluation of the type of anaesthesia between propofol and fentanyl were noticed that propofol is more suitable and a little perfect in using of lumbar spine surgery. In the impact of Surgical effects on the eye were resulted in Painless vision with 2 of 5 patients' cases. The outcomes of the study found the Comorbidities of lumbar spine patients had Kidney failure and Type 2 diabetes high acquiring in the patients within before and preoperative. This study was noticed the lumbar spine surgery have influenced on the eye's vision. Clearly, which all types of anaesthesia which are propofol and fentanyl, but propofol found succeeded with a little score in compare with fentanyl. **Conclusion:** With five patient cases in a cross-sectional analysis, this investigation anticipated the results predicted on the evaluation of the impact of surgery on the lumbar spine upon the vision (an exploratory investigation in Iraqi patients). This study found that following degenerative lumbar surgery, it is not expected that responders and those who did not respond will have the same results at the one-year review. Patients with disc herniation, spinal canal narrowing, and degenerative disc conditions have had surgery in this fashion.

Keywords: lumbar spine surgery; lumbar spine surgery; fentanyl; propofol; Comorbidities; VAS score; and Blood pressure.

INTRODUCTION

Perioperative vision loss (POVL) linked with spinal surgery is an uncommon and severe consequence that often has no cure and has no known cause. Since Hollenhorst, *et al.*, first identified the condition in 1954, multiple investigations have established a direct connection between prone spine surgery and eyesight loss. [Cheng, M.A. *et al.*, 2001; Patil, C.G. *et al.*, 2008]

However, because to its rarity, research on this subject is unfortunately scarce and mostly consists of individual reports of cases and series [Shen, Y. *et al.*, 2009]. The many postoperative sight loss issues following spine surgery are reviewed in this article. The use of colloids vs. crystalloids and -agonists to lower intraocular pressure (IOP), as well as the theoretical ethology, risk factors, and preventative techniques, are also covered. [Warner, M.E. *et al.*, 2001]

Following spine surgery, vision loss may be brought on by cortical blindness, anterior or posterior ischemia, optic neuropathy, central retinal artery blockage, or posterior irreversible

encephalopathy (PRES) [Holy, S.E. *et al.*, 2009]. However, it is thought that after spine and heart procedures, the danger of POVL is greatly increased. [Postoperative Visual Loss Study Group, 2012; Hayreh, S.S, 2013]

Shen and colleagues recently examined data taken from the Nationwide Inpatient Sample (NIS), which included 5.6 million patients [Goepfert, C.E. *et al.*, 2010; Miller, N.R, 2011]. They discovered that the prevalence of POVL was 3.09/10000 (0.03%) following spinal fusion while 8.64/10000 (0.09%) after heart surgery. With rates of occurrence that range from 0.094% to 0.2%, other large-scale datasets imply indicate the rate of POVL may be considerably greater after spine surgery. [Hayreh, S.S, 2011; Lee, L.A. *et al.*, 2010]

Compared to anterior lumbar fusion and cervical fusion, visual loss was more frequent following spinal fusion with scoliosis with posterior lumbar fusion [Berg, K.T. *et al.*, 2010]. Additionally, it was shown to be much more common (1.86/10000,

or 0.19%) with hip and femur procedures. Numerous characteristics of these treatments are common, including considerable bleeding, hemodynamic disturbances, high embolic loads, and severe inflammation. [Buono, L.M. et al., 2005]

based to the American Society of Anaesthesiologists' (ASA) Postoperative Visual Loss Registry [Wollenberg, B. et al., 2004]. In 60% of these instances, PION was identified. In this database, only 11% of the cases involved CRAO [Giordano, C. et al., 2011; Yi, J.H. et al., 2011]. This paper is interested to Evaluate of the effects of lumbar spine surgery on the eye (an exploratory study in Iraqi patients).

PATIENTS AND METHODS

This study as show as a cross-sectional study that focuses on the evaluation of the effects of lumbar spine surgery on the eye (an exploratory study in Iraqi patients. This paper is interested to conduct examinations and evaluations of all data tests before and after operation conduction to patients within ages above 55 even 65 years in different hospitals in Iraq into 16th May 2021 to 26th June 2022. Also, this paper was conducting a statistical study on data examination by the SPSS program.

This paper was examined the distribution of lumbar spine patients based on ages between 55 to 65 years, weight, height, BMI, and sex, both males and females. Where can I find all information in Table 1, Table 2, Table 2, Table 3, Table 4, and Table 5? To further of evaluations, this study was distributed to Comorbidities lumbar spine patients, which find Arteriosclerosis, heart disease, Kidney failure, and Type 2 diabetes which can be seen in Table 6. Moreover, this paper was conducting examinations of Hypertension measurement of

lumbar spine patients which were determined in Table 7.

This study also was extended to evaluate lumbar spine patients by VAS scoring before and after the operation, which can be found in Table Figure 1 and Figure 2. Besides that, this was analysed Outcome of patients after degenerative lumbar spine surgery which determined with three parameters which are Number of days of inpatient care first year related to adverse events (any complication), Length of stay (number of perioperative days), and number of visits which can be clarify in Figure 3.

This study was also Distributed to patients according to the type of anaesthesia (propofol) and (fentanyl) were found in Table 8 and Table 9. As well as this study was found the Distribution of patients according to the duration of back pain and the duration of leg pain, where can be noticed in Table 10 and Table 11.

Furthermore, this study is interested of analyses of blood pressure of lumbar spine patients and Measurement of blood loss, where can be gotten in Table 12 and Table 13.

In addition, this study was determined Surgical effects on the eye, which include Afferent papillary defect, Loss in the right eye without any local signs of swelling or bruising, Loss of visually evoked potential (VEP) on the right side, and Painless vision where can be shown in Table 14. This study was assessed Risk factors were conducted with Age, Sex, Greater Estimated Blood Loss, and Obesity. Then these results have been noticed in Table 14.

RESULTS

Table 1: Distribution of lumbar spine patients based on ages

St		
Age		
N	V	5
	M	0
M		60.8000
SEM		1.59374
MI		60.0000
Mo		57.00 ^a
SD		3.56371
Sk		.272
SES		.913
Min		57.00
Max		65.00
S		304.00

a. Multiple modes exist. The smallest value is shown

Table 2: Changes examine of lumbar spine patients according to sex

		F	P	VP	CP
Valid	Women	2	40.0	40.0	40.0
	Men	3	60.0	60.0	100.0
	Total	5	100.0	100.0	

Table 3: Distribution of lumbar spine patients based on weight

St		
Weight (Kg)		
N	Va	5
	Mi	0
M		82.2000
SEM		3.76032
MI		85.0000
Mo		72.00 ^a
SD		8.40833
Sk		-.253
SES		.913
Min		72.00
Max		92.00
S		411.00
a. Multiple modes exist. The smallest value is shown		

Table 4: Distribution of lumbar spine patients based on height

St		
Height (Cm)		
N	Va	5
	Mi	0
M		174.2000
SEM		3.45543
MI		177.0000
Mo		165.00 ^a
SD		7.72658
Sk		-.416
SES		.913
Min		165.00
Max		182.00
Sum		871.00
a. Multiple modes exist. The smallest value is shown		

Table 5: Distribution of lumbar spine patients based on BMI

St		
BMI (Kg/m2)		
N	Va	5
	Mi	0
M		27.0440
SEM		.62209
MI		26.8500
Mo		25.66 ^a
SD		1.39104
Sk		1.504
SES		.913

Min	25.66
Max	29.37
S	135.22
a. Multiple modes exist. The smallest value is shown	

Table 6: Comorbidities of lumbar spine patients

Comorbidities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Arteriosclerosis	1	20.0	20.0	20.0
	heart disease	1	20.0	20.0	40.0
	Kidney failure	1	20.0	20.0	60.0
	Type 2 diabetes	2	40.0	40.0	100.0
	Total	5	100.0	100.0	

Table 7: Hypertension measurement of lumbar spine patients

N	Va	5
	Mi	0
M	79.9800	
SEM	.47371	
MI	80.4000	
Mo	78.70 ^a	
SD	1.05925	
Sk	-.474	
SES	.913	
Min	78.70	
Max	81.00	
S	399.90	

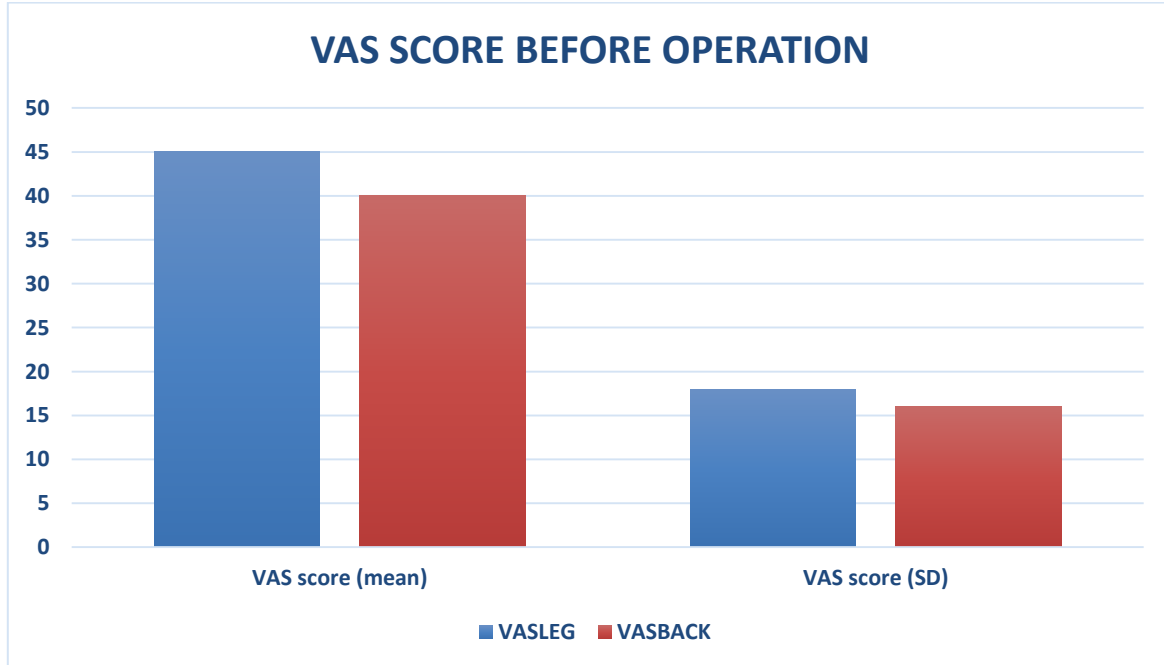


Figure 1: VAS scoring before the operation

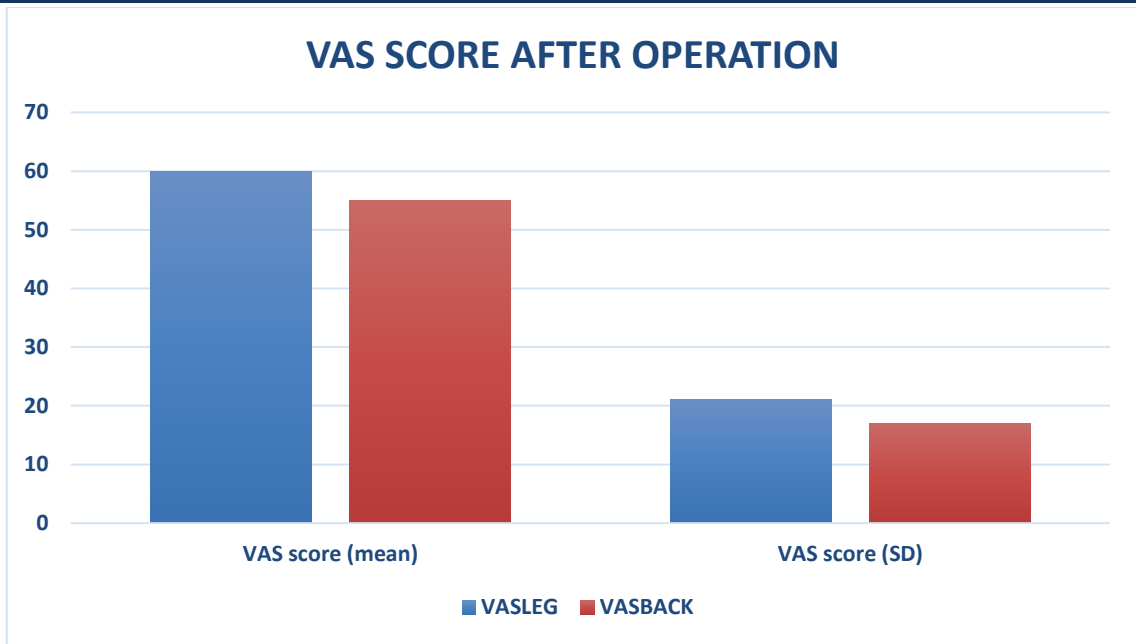


Figure 2: VAS scoring after the operation

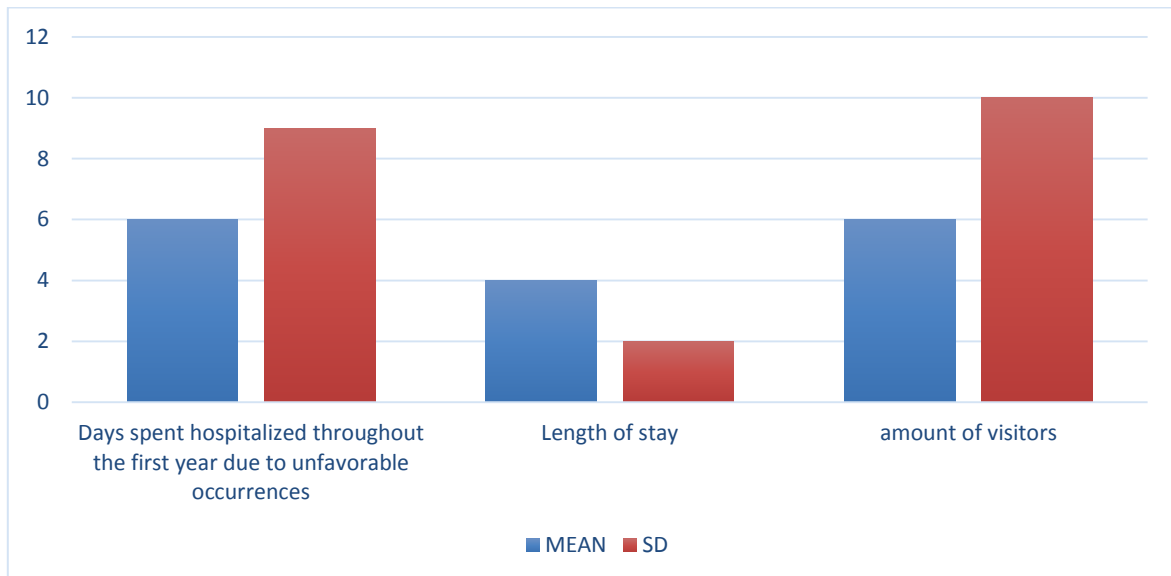


Figure 3: Outcome of patients after degenerative lumbar spine surgery.

Table 8: Distribution of patients according to the type of anesthesia (propofol)

		Propofol			
		F	P	VP	CP
Valid	1.2	1	20.0	20.0	20.0
	1.3	1	20.0	20.0	40.0
	1.4	1	20.0	20.0	60.0
	1.6	1	20.0	20.0	80.0
	1.7	1	20.0	20.0	100.0
Total		5	100.0	100.0	

Table 9: Distribution of patients according to the type of anesthesia (fentanyl)

Fentanyl					
		F	P	VP	CP
Va	1.20	1	20.0	20.0	20.0
	1.30	2	40.0	40.0	60.0
	1.40	1	20.0	20.0	80.0
	1.60	1	20.0	20.0	100.0
	T	5	100.0	100.0	

Table 10: Distribution of patients within the duration of back pain

Duration of back pain				
	F	P	VP	CP
Eleven months	1	20.0	20.0	20.0
Nine months	1	20.0	20.0	40.0
Seven months	1	20.0	20.0	60.0
Six months	1	20.0	20.0	80.0
Three months	1	20.0	20.0	100.0
T	5	100.0	100.0	

Table 11: Distribution of patients according to the duration of leg pain

Duration of leg pain				
	F	P	VP	CP
Eight months	1	20.0	20.0	20.0
Five months	1	20.0	20.0	40.0
Four months	1	20.0	20.0	60.0
Six months	1	20.0	20.0	80.0
Two months	1	20.0	20.0	100.0
T	5	100.0	100.0	

Table 12: Blood pressure of lumbar spine patients

Blood pressure (mmHg)					
	F	P	VP	CP	
V	88.00	1	20.0	20.0	20.0
	89.00	1	20.0	20.0	40.0
	90.00	1	20.0	20.0	60.0
	92.00	1	20.0	20.0	80.0
	94.00	1	20.0	20.0	100.0
	Total	5	100.0	100.0	

Table 13: Measurement of blood loss

blood loss				
	F	P	VP	CP
720.00	1	20.0	20.0	20.0
780.00	1	20.0	20.0	40.0
832.00	1	20.0	20.0	60.0
885.00	1	20.0	20.0	80.0
892.00	1	20.0	20.0	100.0
T	5	100.0	100.0	

Table 14: Surgical effects on the eye

Surgical effects on the eye				
	F	P	VP	CP
Afferent papillary defect	1	20.0	20.0	20.0
Loss in the right eye without any local signs of swelling or bruising.	1	20.0	20.0	40.0
Loss of visually evoked potential (VEP) on the right side	1	20.0	20.0	60.0
Painless vision	2	40.0	40.0	100.0
Total	5	100.0	100.0	

Table 15: Risk factors

Risk factors	F	CI	P-value
Age	3.3	(1.5-6.9)	0.002
Sex	4.2	(1.2-7.3)	0.003
Greater Estimated Blood Loss	4.7	(2.5-6.4)	0.0021
Obesity	5.23	(3.7-8.64)	0.0035

DISCUSSION

This study expected the outcomes predicted in the assessment of the effects of lumbar spine surgery on the eye (an exploratory study in Iraqi patients) with five patients' cases within the cross-sectional study. This study noticed that it is not anticipated that responders and non-respondents will experience similar outcomes after degenerative lumbar surgery at the one-year evaluation. This pattern has seen surgery was performed on patients for disc herniation, spinal stenosis, and degenerative disc disease. [Kim, T.K. *et al.*, 2010]

Although the overall results would otherwise be overstated, it is crucial to pay more attention to characteristics that significantly predict non-response and unsatisfactory outcomes, such as unanticipated adverse occurrences. [American Society of Anesthesiologists, 2012]

This study found that Age, Sex, Greater Estimated Blood Loss, and Obesity factors had a big impact on after lumbar spine surgery. As well as this study showed that VAS scoring assessments were found VAS scoring after the operation shown higher and more perfect than VAS scoring before the operation. In the evaluation of the type of anaesthesia between propofol and fentanyl were noticed that propofol is more suitable and a little perfect in using of lumbar spine surgery. In the impact of Surgical effects on the eye were resulted in Painless vision with 2 of 5 patients' cases.

The outcomes of the study found the Comorbidities of lumbar spine patients had Kidney failure and Type 2 diabetes high acquiring in the patients within before and preoperative. This study was noticed the lumbar spine surgery have influenced on the eye's vision. Clearly, which all types of anaesthesia which are propofol and

fentanyl, but propofol found succeeded with a little score in compare with fentanyl. [Frag, E. *et al.*, 2012; Mizrahi, H. *et al.*, 2011]

CONCLUSION

With five patient cases in a cross-sectional analysis, this investigation anticipated the results predicted on the evaluation of the impact of surgery on the lumbar spine upon the vision (an exploratory investigation in Iraqi patients). This study found that following degenerative lumbar surgery, it is not expected that responders and those who did not respond will have the same results at the one-year review. Patients with disc herniation, spinal canal narrowing, and degenerative disc conditions have had surgery in this fashion.

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