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Research Article

INCIDENCE OF VASCULAR INJURY IN THE SURGERY OF LUMBER SPINE

¹Dr Bilal Jalil, ²Dr Ayesha Saddiqa, ²Dr Muhammad Jhangeer

¹Capital Development Hospital Islamabad, ²DHQ / Teaching Hospital Gujranwala.

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Abstract:

Objective: The aim of this study is to interrogate the occurrence of the vascular injury in the operation of lumbar spine and find out the method for detection and therapy of this complication.

Methodology: Total one thousand one hundred and eleven patients retroactively in Capital Development Hospital Islamabad who got treatment with the surgery of lumbar spine from October 2012 to December 2018. The initially measured outcomes consisted complications of the intra-operative vascular, loss of blood during surgery & mortality during surgery.

Results: The prevalence of this injury is very high in the frontal exposure (9.10%) as compared to the latter exposure (0.290%) & the involvement of segment of L 4-5 was present in 84.40% vascular injuries. Total 19 patients faced the VI in 2 level & Multi-level exposure & twenty-six suffered vascular injuries in 1 level exposure. There was no significant disparity among the patients of both groups. Only one death occurred and all other patients were available with satisfactory results.

Conclusion: There is high prevalence of VI in segment of L4-5 particularly during the application of the anterior exposure & it is the responsibility of the spine specialists to give more consideration to this complication which can lead to the death.

Keywords: Anterior, Spine, Injury, Vascular, Consideration, Lumbar Spine, Segment, Fatal Disorder, Mortality, Complication.

Corresponding author:

Dr. Bilal Jalil,

Capital Development Hospital Islamabad.

QR code



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INTRODUCTION:

In the development of substitute of the bone graft and non-natural discs, the operations of the lumbar are very famous in the department of spine which is in use for the treatment of various complications of lumbar spine like trauma, tumors, TB and disease of the degenerative disc. But the strong anatomic association between lumbar spine & major vessels of blood are the reason of more disorders concluded with different utilized methods. Vascular injury is normal, fatal disorder of lumbar operation & operational repair may be victorious but it needs a main method linked with high rate of mortality of ten percent [1, 2]. As a result, it is very important for the specialist in the field to detect & make the right methods to handle the life threatening disorders.

Consequently, we retroactively checked the information of 1159 patients in this institute underwent surgery of lumbar spine from November 2012 to December 2018. Among total patients forty-five patients had to suffer vascular injury post-surgery or during surgery duration. This study aimed to record the prevalence, in time detection and therapy plan for this said complication which is fatal.

METHODOLOGY:

We collected the data of total 1159 patients who were undergoing the surgery of lumbar spine in Capital Development Hospital Islamabad from October 2012

to December 2018. Different methods of the operations were in action on the patients suffering from the disorders of lumbar spines like the prolapse of the lumbar disc, diseases of the degenerative disc & scoliosis. The most serious vascular injuries were those which were in need of transfusion or the loss of blood more than three hundred milliliters [3]. The record of the data about the demography, methods and exposure level maintained. The measured initial consequences contained vascular disorders during surgery, estimated loss of the blood during surgery & mortality during surgery. SPSS V. 17 was in use for the statistical analysis of the collected information. Fisher's method was in use for the categorical variables. The determination of the relationship level of the spinal exposure & vascular injury carried out with analysis method logistic regression. P value of less than 0.050 was significant.

RESULTS:

There were total 1159 patients who underwent exposures of lumbar spine in which four hundred and sixty-one were the surgeries of anterior spine, six hundred and sixty-seven were the surgeries of posterior spine and thirty-one were the surgeries of both anterior & posterior spines. The range of the age of patients was 17-78 years. There were 748 males and three hundred and eighty-one were female patients. Table-1 shows the operative indications.

Table-I: Indications for Lumbar Spinal Exposure.

Indications	Patients	Percent
Anterior exposure	461.0	39.80
Artificial disc replacement	46.0	4.00
Combined anterior and Posterior exposure	31.0	2.70
Degenerative disk disease	318.0	27.40
Failed previous spinal fusion	17.0	1.50
Lumbar discectomy	117.0	10.10
Lumbar tumor	7.0	0.60
Posterior exposure	667.0	57.50
Lumbar burst fracture	21.0	1.80
Scoliosis	24.0	2.10
Spinal instability	109.0	9.40
Spondylolisthesis	123.0	10.60
Spondyloptosis	35.0	3.00

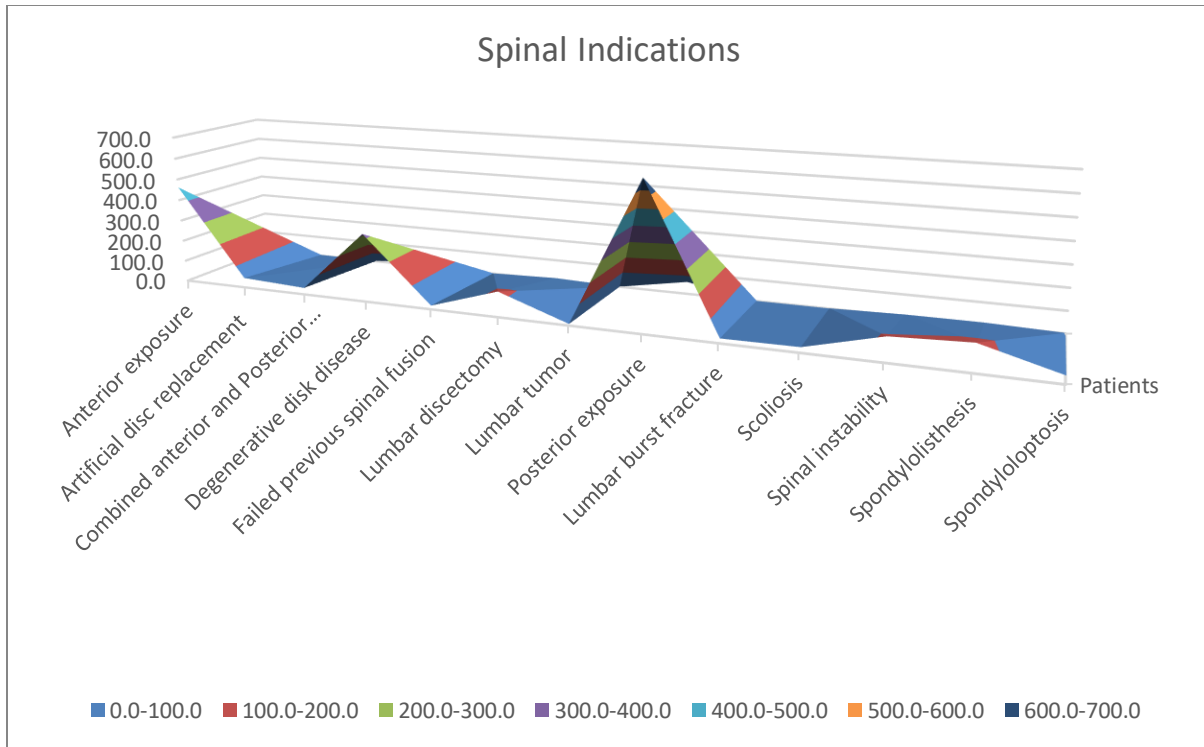
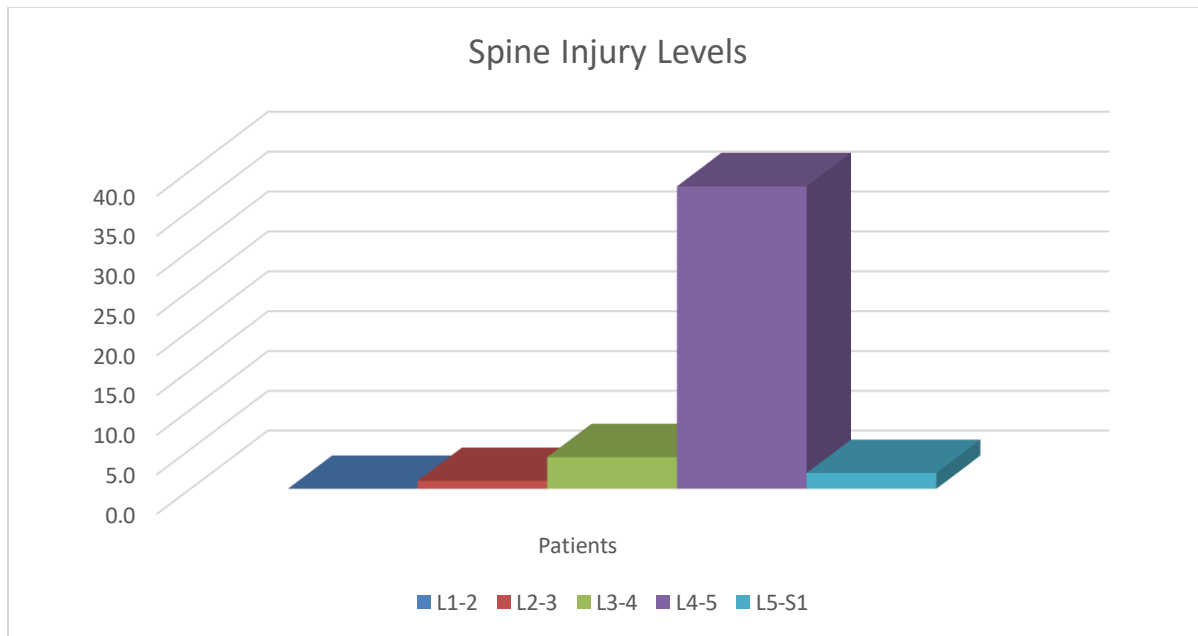


Table-2 is showing the exposure of spinal level & Table-3 shows the amount of the injuries by exposed level. Total 9.10% (n: 42) faced vascular injuries among 461 patients who underwent anterior exposure. Only one case faced the injury after the application of combine anterior & posterior exposure. Only .290% (n: 2) patients faced vascular injuries

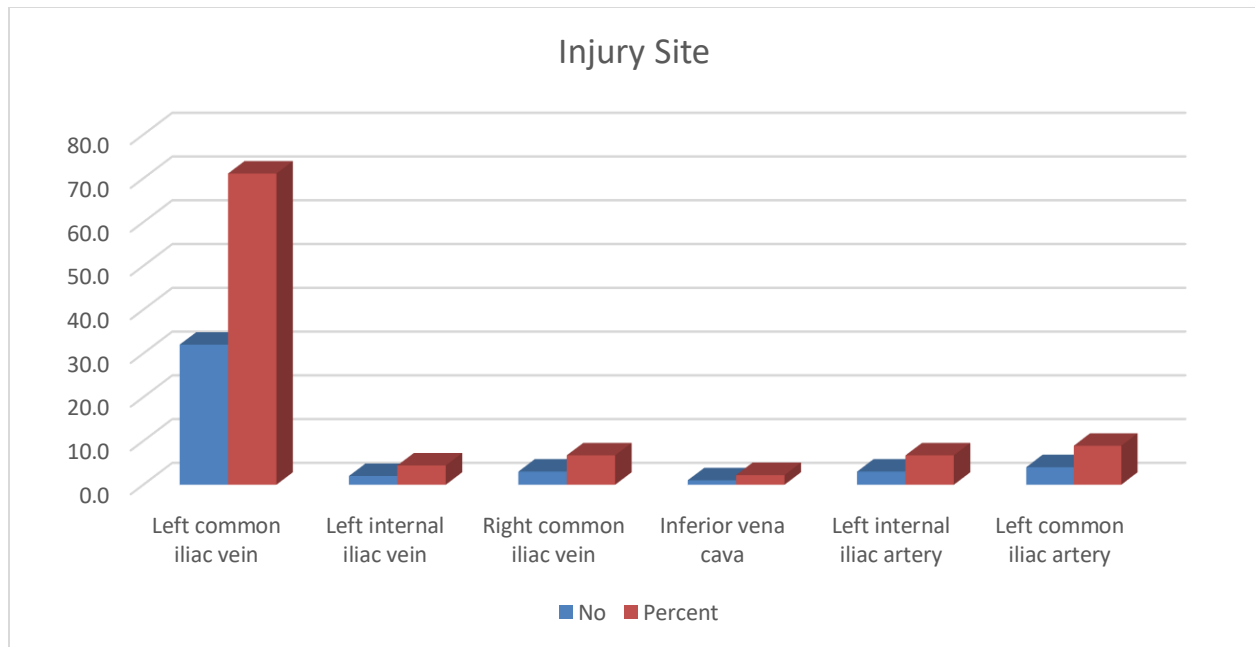
among 667 patients who underwent posterior exposure. The prevalence of vascular injuries in anterior & posterior surgical exposure was 9.10% & 0.290% correspondingly. So, the anterior surgical exposure has an association with the high rate of vascular injuries.

Table-II: Prevalence of Injuries by Spinal Levels.

Spine levels exposed	Patients
L1-2	0.0
L2-3	1.0
L3-4	4.0
L4-5	38.0
L5-S1	2.0

**Table-III: Location of Vascular Injury**

Site of Injury	No	Percent
Left common iliac vein	32.0	71.10
Left internal iliac vein	2.0	4.40
Right common iliac vein	3.0	6.70
Inferior vena cava	1.0	2.20
Left internal iliac artery	3.0	6.70
Left common iliac artery	4.0	8.90



The prevalence of the vascular injuries was much high in the segment of L 4-5 in comparison with the other segments. In total forty-five patients who faced VI, injury of the left iliac vein was present in thirty-two patients, injury of right iliac vein was available in 3 patients, and injury of left iliac artery was present in the case of four patients, internal left iliac vein injured in 2 patients & inferior vena-cava disturbed in only one patient. Among total forty-five patients, 42 patients got injury in the anterior surgery. Different complications arouse as a consequence of these injuries which handled with further clinical therapies or surgical intervention. Some of the injuries remained undiscovered for many years.

DISCUSSION:

VI is not a common complication and it is the outcome of the surgery of lumbar spine. This complication needs early intervention as well as early diagnosis. In this research work, we provided a review of our practice in handling the VI after the surgery of lumbar spine to support the spine specialists to find out the methods of detection as well as treatment of this disorder which can lead to high mortality rate. In this work, we discovered that most of the VI occurred in the segment of L 4-5. Prevalence of this segment was much high as compared to the other segments. The findings of this research work are similar to many other case works [4, 5]. The most common injured vessels are iliac arteries & veins [1].

We discovered in this research work that the prevalence of VI is very high in the anterior surgical

exposure of the spine in comparison with the posterior surgical exposure of spine. We discovered only 2 patients among total six hundred and sixty-seven patients who underwent posterior exposure whereas we diagnosed the forty-two patients with VI among total four hundred and sixty-one patients who underwent anterior exposure. There is high rate of risk of the VI in the anterior surgical exposure of lumbar spine, the strong association between lumbar spine and veins are the main cause [3]. The processes of retroperitoneal inflammatory caused from the already prevailing degeneration of the disc resulting to adhesion among great veins and disc may increase the dangers of the VI [6]. There is need of more attention while performing the anterior surgical exposure of lumbar spine.

Canaud concluded that endovascular method is very effectual as well as reliable procedure with very less rate of mortality in comparison with the other surgical procedures [1]. We can use this method in future with a huge sample size. The injuries in the posterior exposure were very less as compared to the anterior surgical exposure of lumbar spine. The early detection and the treatment of these injuries is very difficult after their occurrence. In one patient, we were unable to find any injury or anomalous bleeding which can be the result of structure of disc annulus leading to the leakage of the blood [7]. Late symptoms of hemodynamic may have association with the compressive impact of prone location [7]. As a result, there is an attachment of VI with the posterior surgery of lumbar spine.

We concluded in this research work that fasciotomy is very vital in the treatment or reconstruction of the VI due to the trauma of soft tissues, injury of veins and crush injury cause in the great danger of the compartment syndrome [8, 9]. Some specialists concluded that fasciotomy performed at the time repair of artery but prior to the advancement of compartment syndrome have the ability to decrease the rates of amputations predominantly [10]. In the examination of thirteen hundred and fifteen patients experiencing the anterior surgery of lumbar spine, Brau proposed the prophylactic fasciotomies for the participant who found with ischemic for greater than 2 hours if they were present without any vascular disease [5]. In this research work, we performed the fasciotomy on two patients instantaneously during surgery of the vascular repair & we discovered the best results in both patients. The findings of this research work showed that the application of fasciotomy has the ability to play a vital part in the prevention of the disorders in vascular injuries treatments.

CONCLUSION:

We reviewed the total data of 1159 patients in this very institute who got treatment with the utilization of lumbar for a period of %5 years. We found that the high occurrence of VI was in segment of L 4-5 with the application of the anterior exposure. Majority of the patients can get treatment with the use of suture intraoperatively, but these are much threatening to life & the surgeons of spine must pay more attention to reduce such complication which leads to high mortality rate.

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