International Journal of
Health Systems and Medical Science

ISSN: 2833-7433
Volume 2 | No 11 | Nov - 2023

Outcomes of patients following surgical treatment for lumbar degenerative spine conditions in Iraq

Dr. Dhafer Faisal Iawajah[1], Dr. Mudhafar Jamal Ahmed[2], Dr. Osama Mohammed Rasheed[3]

[1] M.B.Ch.B., C.A.B.N.S., Neurosurgery, Iraqi Ministry of Defense, Baghdad, Al Hussein Military Hospital, Baghdad, Iraq; e-mail: dhafer.20001@gmail.com

[2] M.B.Ch.B., C.A.B.N.S., Neurosurgery, Iraqi Ministry of Health, Baghdad Al-Rusafa Health Directorate, Dr. Saad AL-Witry Hospital for Neurosciences, Baghdad, Iraq; e-mail: dafory1980@gmail.com

[3] M.B.Ch.B., C.A.B.N.S., Neurosurgery, Iraqi Ministry of Health, Baghdad Al-Karkh Health Directorate, AL Karkh General Hospital, Baghdad, Iraq; e-mail: dr_mouse86@yahoo.com

Abstract:

Background: In general, this study demonstrated the association between the surgical treatment of lumbar degenerative conditions in Iraqi patients and its effect on postoperative morbidity.

Aim: This study was aimed to assess outcomes of surgical treatment for Iraqi patients' lumbar degenerative spine.

Patients and methods: Databases were collected related to 105 patients from different hospitals in Iraq between 15th July 2022 to 9th March 2023. A statistical analysis was performed on the pre- and post-operative surgical outcomes relating to both surgeries, where this was achieved by measuring factors such as pain, disability, and walking ability using the Oswestry Disability Index and visual analogue scale, alongside walking ability in meters. The surgical outcome data was analyzed and formulated using SPSS, version 22.0.

Results: The study revealed that patients who underwent lumbar decompression surgery exhibited a greater improvement rate in their leg and back pain than those who underwent lumbar fusion surgery. Specifically, the back pain score was (3.1 ± 1.9) and the leg pain score was (3.5 ± 1.5) for the decompression group, resulting in a positive effect on their overall quality of life, which was scored at (82.61 ± 6.22).

In contrast, patients who underwent lumbar fusion surgery recorded a lower score of (66.81 ± 9.8). The Oswestry Disability Index indicated an increase in walking ability with scores of (18.28 ± 21.67) for patients who received lumbar decompression surgery and (35.15 ± 24.56) for those who underwent lumbar fusion surgery.

Conclusion: Our paper discovered a significant improvement in postoperative results for patients who underwent lumbar decompression surgery compared to those who had lumbar fusion surgery in terms of pain levels, disability, and walking ability. Lumbar decompression surgery had a post-operative complication rate of seven patients, with infections and blood clots being the most prevalent.

Key words:

Lumbar degenerative conditions; Lumbar decompression surgery; Lumbar fusion surgery; Visual analogue scale; and Oswestry Disability Index.

Introduction:

The increase in the average life expectancy of the population in developed countries and, at the same time, the improvement of diagnostic methods has led to an increase in the number of patients with degenerative diseases of the spine that require high-tech surgical care [1,2]. In response to the increase in the number of patients with degenerative diseases of the spine, new, mostly minimally invasive surgical technologies are being introduced into practice [3]. The effectiveness of surgical treatment primarily depends on the correctness of the choice of the intervention option and on the quality of its implementation [4]. The quality of surgical intervention during which an implant is installed is directly related to the accuracy of its positioning. In the conditions of rapid development of spinal neurosurgery, there was a need for intraoperative control of the position of implants using visualization tools and a navigation system. At the same time, it became possible not only to increase patient safety and improve the quality of treatment but also to use new methods of stabilizing vertebral segments. [5,6]

Degenerative changes in the anatomical elements of the lumbar segments of the spine are often accompanied by the development of compression and/or pseudoradicular clinical symptoms [7]. The morphostructural cascade of these changes is characterized by gradual degeneration of intervertebral discs (IVD) and arch-process joints (DS), which does not always run in parallel [8]. The variety of variants of neurological manifestations, functional disorders of the vertebral-motor segments, as well as the severity of pathological changes in the anterior and posterior support complexes in degenerative diseases of the lumbar spine stimulates the development of various approaches in spinal surgery, from percutaneous puncture to advanced decompression-stabilizing techniques. [9-12]

The success of spinal interventions is directly related to the elimination of the cause of clinical symptoms and the restoration of normal biomechanics of the operated segments [13]. At the same time, the absence of uniform therapeutic and diagnostic algorithms in vertebrology, high variability of surgical decisions, and a wide range of morphological substrates that cause neurological disorders determine the subjectivity of the surgeon's decision-making and, therefore, a high level of unsatisfactory postoperative outcomes [14]. In addition, the above circumstances are associated with a significant financial burden on the healthcare system in the form of repeated hospitalizations, re-operations, as well as the development of perioperative complications, with prolonged or complete disability of the operated patient. [15]

The formation of a methodology aimed at improving the outcomes of surgical interventions in patients with degenerative diseases of the lumbar spine is based on the determination of objective clinical and, anatomical and structural parameters necessary to create personalized surgical approaches, as well as on the development of criteria for predicting the development of perioperative adverse effects. [16,17]

Patients and methods:

Our paper conducted a prospective study related to patient outcomes after surgical treatment of degenerative lumbar spine conditions in Iraq, including 105 patients aged between 46-70 years. Databases were collected from different hospitals in Iraq between 15th July 2022 to 9th March 2023.

Clinical demographic data for lumbar degenerative spine patients was constructed, which included age, sex, body mass index, comorbidities, ASA grade, types of surgery, smoking, education

level, and economic level. Our study diagnosed clinical data and surgical outcomes, which included the basic diagnoses of spinal stenosis, herniated disc, spondylosis with radiculopathy, spondylolisthesis, disc degeneration, and pseudarthrosis, as well as medical causes.

The data were divided into two types of surgery: lumbar decompression surgery with 77 patients and lumbar fusion surgery with 28 patients. A statistical analysis was conducted of the pre- and post-operative surgical outcomes, which were associated with both surgeries, by measuring the degree of pain, disability, and walking ability based on the visual analogue scale and Oswestry Disability Index, as well as walking ability in meters. Surgical outcome data were analyzed and designed using SPSS, version 22.0.

Our study assessed the patient's quality of life and health based on 12 items from the SF-12 and the EQ-5D QOL scale, which assessed the patient's health-related quality on five levels. Surgical outcomes were defined as pain rates, which included leg pain and back pain. Also, this study showed clinical data related to the length of stay in the hospital, follow-up after surgery, and the level of satisfaction after surgery in terms of excellent, satisfactory, and poor. The study results in distributed complications related to lumbar degenerative spine patients after surgery.

Results:

Table (1) Demographic data of patients with lumbar degenerative spine.

Variables	***Number of patients [105]***
Age, year [Mean ± SD]	58.131 ± 12.40
Gender N [%]	
Males	65 [61.90%]
Females	40 [38.10%]
BMI [Kg/m2, mean (SD)]	30.73 ± 4.78
Comorbidities	
Hypertension	38 [36.19%]
Diabetes Type 2	31 [29.52%]
Cardiovascular disease	23 [21.90%]
Pulmonary disease (COPD)	13 [12.38%]
ASA grade	
I	38 [36.19%]
II	43 [40.95%]
III	24 [22.86%]
Type of surgery	
Lumbar decompression surgery	77 [73.33%]

Lumbar fusion surgery	28 [26.67%]
Smoking	
Smokers	40 [38.10%]
Non-smokers	65 [61.90%]
Education level	
Primary	35 [33.33%]
Secondary	30 [28.57%]
College	40 [38.10%]
Economic Level	
400 $	28 [26.67%]
800 $	40 [38.10%]
1200 $	21 [20%]
2300 $	16 [15.24%]

Table (2) Primary diagnoses.

Variables	***Outcomes***
Spinal stenosis	29 [27.62%]
Herniated disc	25 [23.81%]
Spondylosis with radiculopathy	15 [14.29%]
Spondylolisthesis	14 [13.33%]
Disc degeneration	12 [11.43%]
Pseudoarthrosis	10 [9.52%]

Table (3) Medical causes.

Causes	***Number of patients [105]***	***%***
Systemic infections	34	32.38%
Neurological	30	28.57%

Pain	19	18.10%
Gastrointestinal	10	9.52%
Systemic disturbances	8	7.62%
DVT	4	3.81%

Table (4) Pre-operative pain assessment associated with the lumbar degenerative spine by VAS and ODI.

Variables	***Patients' outcomes of pain***
VAS score	
***Back pain (Mean* ± SD)**	6.1± 2.0
***Leg pain (Mean* ± SD)**	7.27 ±2.61
Oswestry Disability Index (ODI)	50.86 ± 20.53
Walking ability: median (min; max)	924 [15;10,000]
Preoperative QOL patients	
SF-12	25.7 ± 14.8
EQ-5D QOL	0.566 ± 0.158

Table (5) Evaluate post-operative pain and disability of patients by VAS and ODI.

Variables	***Lumbar decompression surgery***	***Lumbar fusion surgery***
VAS		
Back pain	*3.1* ±1.9	3.4 ± 2.6
Leg pain	*3.5* ± 1.5	*4.6* ±1.4
QOL		
SF-12	*82.61* ± 6.22	*66.81* ±9.8

EQ-5D	*0.52* ± 0.24	*0.72* ± 0.38
Disability status		
ODI	*18.28* ± 21.67	*35.15* ±24.56

Table (6) Identify surgical outcomes of patients after surgery.

Outcomes	***Lumbar decompression surgery***	***Lumbar fusion surgery***
Length of stay, Days (Mean ± SD)	*2.5* ± 0.5	*6.2* ± 0.8
Follow-up, Years	*Two years*	*Two years*
Stratification level		
Excellent	50 [64.94%]	14 [50%]
Satisfactory	24 [31.17%]	10 [35.71%]
Poor	3 [3.9%]	4 [14.29%]
Walking distance, median (min; max)	*1820 [10;10,000]*	*1341 [10;10,000]*

Table (7) Post-operative complications.

Complications	***Lumbar decompression surgery [77]***	***Lumbar fusion surgery [28]***
Infection	3 [3.9%]	4 [14.29%]
Hematoma	1 [1.3%]	2 [7.14%]
Nerve injury	1 [1.3%]	2 [7.14%]
Blood clots	2 [2.6%]	1 [3.57%]
Total	***7 [9.09%]***	***9 [32.14%]***

Discussion:

Our study analyzed and evaluated the surgical outcomes of lumbar degenerative patients. This study showed that most of these patients suffered from men, at a rate of 61.90%, compared to women, at a rate of 38.10%. For preoperative clinical outcomes, demographic data showed the prevalence of hypertension (36.19%) and type 2 diabetes to be widespread among patients at

29.52%. This study concluded that there is a strong statistical relationship between smoking and its effect on patients suffering from degeneration of the lumbar spine. Compared to previous studies, cigarette smoking is considered one of the main risk factors related to degenerative lumbar spine disease and its association with the early onset of the disease, as improvement was shown in smoking patients after partial decompression of lumbar spinal stenosis compared to non-smoking patients after surgery, which negatively affects patients who they have degeneration of the lumbar spine which causes poor outcomes and increased risk of complications and mortality after surgery [18]. Clinical results showed that the percentage of smokers was (38.10%) and non-smokers was 61.90%.

Regarding patient diagnoses, the results of data related to the patient's initial diagnosis were recorded, the most prominent of which were spinal stenosis at a rate of 27.62% and a herniated disc at a rate of 23.81%. However, an American study published in 2018 showed that the degree of radiographic stenosis on MRI is not primarily related to functional disability, pain severity, or ability to walk [19]. Moreover, the decreased cross-sectional area of the dural sac is considered to negatively affect walking ability in patients undergoing conservative treatment, especially in females. Our results recorded clinical data related to the degree of back pain (6.1±2.0), leg pain (7.27±2.61), and disability before surgery (50.86±20.53), as well as the SF-36, which is considered the longest in measuring health-related quality of life in patients, which was (25.7± 14.8) Before the wound.

Compared with postoperative results, the results showed that the rate of leg pain and back pain was more improved in patients who had lumbar decompression surgery compared to lumbar fusion surgery, where back pain was (3.1 ± 1.9) and leg pain (3.5 ± 1.5), which affected the quality. Healthy living in a positive way was (82.61 ± 6.22) for patients who had lumbar decompression surgery and (66.81 ± 9.8) for patients who had lumbar fusion surgery. Also, the Oswestry Disability Index showed an improvement in the ability to walk, and it was (18.28 ± 21.67) for patients who had decompression surgery. Lumbar and (35.15±24.56) for patients with lumbar fusion surgery. In addition, the research results expanded the data recorded for the postoperative operation, which included the length of stay in the hospital, and was from two days to a week, the duration of the postoperative follow-up was two years, and the level of postoperative satisfaction was excellent for 50 patients undergoing lumbar decompression surgery and 14 patients. Under the lumbar fusion operation as for the level of disease, there were 24 patients under the lumbar decompression surgery procedure and ten patients under the lumbar fusion operation, with the ability to walk, which created a high and successful improvement and development for the postoperative patients: 1820 for the lumbar decompression surgery patients and 1341 for the lumbar fusion patients. Some studies were confirmed that role of lumbar decompression and fusion surgery on patients where notice that lumbar decompression was showed better postoperative functional recovery and reduced hospital stay in elderly patients with two-segment lumbar spinal stenosis, which causes of improves early ambulation in elderly patients undergoing lumbar decompression and fusion surgery, including improved postoperative physical functional outcomes and reduced length of hospital stay [20,21]. A Spanish study confirms that lumbar decompression surgery is associated with improved postoperative functional recovery and shorter hospital stays compared to decompression and fusion with internal fixation. However, post-operative complications can have a significant impact on patients. It should be noted that poor outcomes were related to pre-existing medical conditions. Other studies have sought to emphasise the significance of walking for patients following surgery, as it is associated with improved physical functional outcomes and reduction in complications. In certain cases, lumbar decompression alone may be effective. [22,23]

Conclusion:

The study demonstrated the beneficial effects of treating patients with lumbar spine degeneration, resulting in a reduction of back and leg pain. The improvement in overall quality of life, disability, and mobility can be attributed to the positive outcomes. Smoking, age, gender, health outcomes, and complication rate were identified as significant risk factors for postoperative patients. Our study found a substantial enhancement in postoperative outcomes for patients who underwent lumbar decompression surgery as compared to those who underwent lumbar fusion surgery in terms of pain rate, disability, and walking ability. The rate of post-operative complications following lumbar decompression surgery was seven patients, with infections and blood clots being the most prominent.

References:

1. S. Karstensen, T. Bari, M. Gehrchen, J. Street, B. Dahl, Morbidity and mortality of complex spine surgery: a prospective cohort study in 679 patients validating the Spine AdVerse Event Severity (SAVES) system in a European population, Spine J. 16 (2016) 146–153.
2. [2] A.A. Baaj, G. Lang, W.-C. Hsu, M.J. Avila, J. Mao, A. Sedrakyan, 90-day readmission after lumbar spinal fusion surgery in New York State between 2005 and 2014: A 10-year analysis of a statewide Cohort, Spine 42 (2017) 1706–1716.
3. R. Nasser, S. Yadla, M.G. Maltenfort, J.S. Harrop, D.G. Anderson, A.R. Vaccaro, A. D. Sharan, J.K. Ratliff, Complications in spine surgery, J. Neurosurg. Spine 13 (2010) 144–157.
4. A. Jain, V. Puvanesarajah, E.N. Menga, P.D. Sponseller, Unplanned hospital readmissions and reoperations after pediatric spinal fusion surgery, Spine 40 (2015) 856–862.
5. A. Gupta, G.C. Fonarow, The hospital readmissions reduction program-learning from the failure of a healthcare policy, Eur. J. Heart Fail. 20 (2018) 1169–1174.
6. A.J. Pugely, C.T. Martin, Y. Gao, S. Mendoza-Lattes, Causes and risk factors for 30-day unplanned readmissions after lumbar spine surgery, Spine 39 (2014) 761–768.
7. M. Elsarrag, S. Soldozy, P. Patel, P. Norat, J.D. Sokolowski, M.S. Park, P. Tvrdik, M. Y.S. Kalani, Enhanced recovery after spine surgery: a systematic review, Neurosurg. Focus. 46 (2019), E3.
8. M. Corniola, B. Debono, H. Joswig, J.-M. Lem´ee, E. Tessitore, Enhanced recovery after spine surgery: review of the literature, Neurosurg. Focus. 46 (2019).
9. N. Dietz, M. Sharma, S. Adams, A. Alhourani, B. Ugiliweneza, D. Wang, M. Nuno, ˜ D. Drazin, M. Boakye, Enhanced recovery after surgery (ERAS) for spine surgery: a systematic review, World Neurosurg. 130 (2019) 415–426.
10. T.W. Wainwright, T. Immins, R.G. Middleton, Enhanced recovery after surgery (ERAS) and its applicability for major spine surgery, best. Pract. Res. Clin. Anaesthesiol. 30 (2016) 91–102.
11. S. Solumsmoen, T.J. Bari, S. Woldu, O.B. Zielinski, M. Gehrchen, B. Dahl, R. BechAzeddine, Morbidity and mortality following degenerative spine surgery in a prospective cohort of 1687 consecutive surgical procedures, Acta Neurochir. (Wien.) 163 (2021) 281–287.
12. B. Debono, T.W. Wainwright, M.Y. Wang, F.G. Sigmundsson, M.M.H. Yang, H. Smid-Nanninga, A. Bonnal, J.-C. Le Huec, W.J. Fawcett, O. Ljungqvist, G. Lonjon, H.D. de Boer, Consensus statement for perioperative care in lumbar spinal fusion: enhanced

recovery after surgery (ERAS®) society recommendations, Spine J. 21 (2021) 729–752, https://doi.org/10.1016/j.spinee.2021.01.001.

13. A.A. Elsamadicy, X. Ren, H. Kemeny, L. Charalambous, A.R. Sergesketter, S. Rahimpour, T. Williamson, C.R. Goodwin, M.M. Abd-El-Barr, O.N. Gottfried, J. Xie, S.P. Lad, Independent associations with 30- and 90-day unplanned readmissions after elective lumbar spine surgery: a national trend analysis of 144 123 patients, Neurosurgery 84 (2019) 758–767, https://doi.org/10.1093/ neuros/nyy215.
14. C. Akamnonu, T. Cheriyan, J.A. Goldstein, V. Lafage, T.J. Errico, J.A. Bendo, Unplanned hospital readmission after surgical treatment of common lumbar pathologies: rates and causes, Spine 40 (2015) 423–428, https://doi.org/10.1097/ BRS.0000000000000759.
15. P.T. Akins, J. Harris, J.L. Alvarez, Y. Chen, E.W. Paxton, J. Bernbeck, K.H. Guppy, Risk factors associated with 30-day readmissions after instrumented spine surgery in 14,939 patients: 30-day readmissions after instrumented spine surgery, Spine 40 (2015) 1022–1032.
16. R.K. Wadhwa, J. Ohya, T.D. Vogel, L.Y. Carreon, A.L. Asher, J.J. Knightly, C. I. Shaffrey, S.D. Glassman, P.V. Mummaneni, Risk factors for 30-day reoperation and 3-month readmission: analysis from the quality and outcomes database lumbar spine registry, J. Neurosurg. Spine 27 (2017) 131–136.
17. O. Adogwa, A.A. Elsamadicy, J.L. Han, I.O. Karikari, J. Cheng, C.A. Bagley, 30-day readmission after spine surgery: an analysis of 1400 consecutive spine surgery patients, Spine 42 (2017) 520–524.
18. M.C. Wang, M. Shivakoti, R.A. Sparapani, C. Guo, P.W. Laud, A.B. Nattinger, Thirty-day readmissions after elective spine surgery for degenerative conditions among US Medicare beneficiaries, Spine J. 12 (2012) 902–911.
19. M.J. McGirt, S.L. Parker, S. Chotai, D. Pfortmiller, J.M. Sorenson, K. Foley, A. L. Asher, Predictors of extended length of stay, discharge to inpatient rehab, and hospital readmission following elective lumbar spine surgery: introduction of the Carolina-Semmes Grading Scale, J. Neurosurg. Spine 27 (2017) 382–390.
20. J. Hills, A. Sivaganesan, I. Khan, S. Chotai, B. Weisenthal, T. Freeman, M. Butler, J. Wick, J. Daryoush, A. Asher, C.J. Devin, Causes and timing of unplanned 90-day readmissions following spine surgery, Spine 43 (2018) 991–998.
21. B.I. Martin, S.K. Mirza, B.A. Comstock, D.T. Gray, W. Kreuter, R.A. Deyo, Reoperation rates following lumbar spine surgery and the influence of spinal fusion procedures, Spine 32 (2007) 382–387.
22. H. Ilyas, J.L. Golubovsky, J. Chen, R.D. Winkelman, T.E. Mroz, M.P. Steinmetz, Risk factors for 90-day reoperation and readmission after lumbar surgery for lumbar spinal stenosis, J. Neurosurg. Spine 31 (2019) 20–26.
23. J.T. Bernatz, P.A. Anderson, Thirty-day readmission rates in spine surgery: systematic review and meta-analysis, Neurosurg. Focus. 39 (2015).