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Elective Lumbar Spine Surgery in Depressed Patients: Is it Worth it?

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ABSTRACT

Background: The objective of this study is to compare surgical results (pain, function, and satisfaction) between a group of depressed patients and a nondepressed group who had been operated on for a degenerative lumbar condition.

Methods: Prospective observational study. Preoperative pain (lumbar and radicular visual analog scale [VAS]), function (Oswestry Disability Index [ODI]), and depression (Zung depression scale) data were collected in patients listed to be operated on for a lumbar degenerative condition. One year postoperatively, ODI and VAS data were collected again as well as a satisfaction question (are you satisfied with the surgical results? Yes/no).

Results: Ninety-seven patients were included in the study, 78 nondepressed patients (80.4%) and 19 depressed patients (19.6%). Preoperatively, depressed patients had more lumbar pain ($P = .00$) and more functional limitation ($P = .01$) than nondepressed patients. One year postoperatively, depressed patients had more radicular pain ($P = .029$) and more functional limitation ($P = .03$) than non-depressed patients. The overall improvement of pain and function was similar between both groups (not significant). Seventy percent of depressed patients and 80% of nondepressed patients were satisfied with the surgical outcome ($P = .52$) 1 year postoperatively.

Conclusion: Depressed patients experience the same overall level of improvement as nondepressed patients, despite having more pain and functional limitation preoperatively and 1 year after elective lumbar spine surgery than nondepressed patients. The level of satisfaction does not differ significantly between the two groups.

Level of Evidence: 2.

Lumbar Spine

Keywords: lumbar spine, elective surgery, depression, outcomes, satisfaction

INTRODUCTION

Unspecified low back pain is a very common cause of disability worldwide,[1] and the estimated costs related to this have increased dramatically in the last few years.[2] Most people with nonspecific low back pain are successfully managed with nonsurgical treatment. However, some of these patients with persistent pain are offered different types of lumbar spine surgery.[3]

It is important to recognize and select appropriate candidates for a foreseeable significant surgical success, which, in itself, is a complex, multifactor construction of subjective and objective variables.

Symptoms of preoperative anxiety and depression occur in approximately one third of chronic back pain patients undergoing surgery and are found to be common in chronic back pain patients in general.[4,5]

Many articles with contradictory results have been published that assessed the impact of depression on the final outcomes of a lumbar surgery for a degenerative condition. Some authors found increased pain and postoperative disability in depressed patients.[6–11] Katz et al[12] found an association between depression and more postoperative dissatisfaction 6 months after spinal stenosis surgery. Two years later, the same group published a follow-up of the same sample and found that the preoperative depression score was associated with worse satisfaction.[13]

Some other authors did not find any relationship between depression and surgical results.[14–16] Elsamadicy et al[14] did not find differences in complication rates, walking abilities, and visual analog scale (VAS) scores between patients with and without depression when a sample of patients with a deformity diagnosis was studied.

The objective of the present study was to assess the surgical outcomes (according to VAS, Oswestry Disability Index (ODI), and a satisfaction questionnaire) in depressed and nondepressed patients who were operated on for a degenerative condition of the lumbar spine. The initial hypothesis was that depressed patients benefit from surgery in a similar way to nondepressed patients.

METHODS

A prospective observational study was performed in a single hospital and included patients listed to be operated on for a lumbar degenerative condition between September 2014 and April 2016 that agreed to be included in the study.

The inclusion criteria were patients older than 18 years old that needed surgery at one or two levels and required instrumentation or not for a degenerative condition of the lumbar spine. Diagnosis included disc herniation, degenerative disc disease, degenerative spondylolisthesis, or canal stenosis. Surgery was proposed when all conservation measures had failed. First surgeries and reoperations were both included if reoperation was for a different condition than the present procedure.

Patients requiring surgery for a fracture, infection, or tumor were excluded, as were patients requiring long fusions (more than two levels) and those who refused to participate.

Age, sex, surgical procedure, and first surgery or reoperation were recorded at the baseline in addition to standardized, functional pain and depression self-administered tests, including a VAS (lumbar and radicular VAS)[17,18] and ODI,[19–21] which is the most widely used back-specific disability questionnaire. Scores ranged from 0 to 100, where, according to the original publication, 0–20 indicates minimal, 20–40 indicates moderate, and 40–60 indicates severe disability. More than 60 points indicates severe impairment or even exaggerating the symptoms. Finally, a Zung depression scale (ZDS)[22,23] was also assessed and consisted of a 20-item self-administered questionnaire, which is already validated in orthopedic surgery and has been used in previously published similar studies.[8,24,25] The scale ranges from 0 to 100, and depression is considered when 50 points or more are obtained.

One year after the surgical procedure and after the outpatient visit, a self-administered set of questions was also collected, including ODI, lumbar and radicular VAS, and a satisfaction question (are you satisfied with surgical results?). Possible responses were yes or no.

Table 1. Surgical procedure performed.

Surgical Procedure	*n*	Percentage
Discectomy, $N = 25$		25.8
Depressed	2	
Nondepressed	23	
One-level arthrodesis, $N = 46$		47.5
Depressed	12	
Nondepressed	34	
Two-level arthrodesis, $N = 12$		12.3
Depressed	4	
Nondepressed	8	
Laminectomy without fusion, $N = 14$		14.4
Depressed	1	
Nondepressed	13	
Total		100

Statistical Analysis

Continuous variables were expressed as mean and standard deviation. Categorical variables were described using frequencies and percentages. The Wilcoxon test was used to compare lumbar/radicular VAS and ODI preoperatively and 1 year after surgery. The *U* Mann-Whitney test was used to compare ZDS with VAS and ODI. Finally, a Fisher's exact test was used to find the relationship between ZDS and satisfaction.

P values of less than .05 were considered statistically significant. Statistical analysis was performed using the SPSS version 12.0 software (SPSS Inc., Chicago, Illinois, USA).

RESULTS

One hundred and thirteen patients were initially enrolled in the study, but 16 of them had to be excluded because the ZDS was incorrectly fulfilled, so 97 patients were included. Fifty-four (56%) were men and 43 (44%) were women. The average age was 56 years old (range, 21–80). Seventy-eight patients were nondepressed (80.4%), and 19 had obtained a score of at least 50 points in the ZDS, so 19.6% of the sample had a diagnosis of depression. No differences according to age and sex were found between the two groups. Table 1 shows the surgical procedure performed, differentiating the number of depressed and nondepressed patients in each procedure.

Sixty-nine patients (71.4%) were operated on for the first time, and 28 patients had previously been operated on for a different condition.

Table 2. Means and standard deviation of preoperative visual analog scale (VAS) and Oswestry Disability Index (ODI) values comparing depressed and nondepressed patients.

	Preoperative Lumbar VAS	Preoperative Radicular VAS	Preoperative ODI
Nondepressed, mean (SD)	6.67 (2.99)	7.06 (3.19)	38.52 (18.32)
Depressed, mean (SD)	8.55 (1.70)	7.76 (2.84)	51.94 (20.89)
P value	.00	n.s.	.01

Abbreviations: n.s., not significant; SD, standard deviation.

Table 2 shows the preoperative lumbar and radicular VAS and ODI results comparing depressed and nondepressed patients. Depressed patients have higher scores of lumbar VAS and ODI than nondepressed patients.

One year after the surgery, both groups significantly improved their lumbar VAS ($P = .00$), radicular VAS ($P = .00$), and ODI ($P = .00$). Table 3 shows more detailed postoperative results. Patients in the depressed group have more radicular pain and dysfunction than nondepressed patients 1 year after the surgery.

In Table 4, a difference score (postoperative values – preoperative values) was used to represent the improvement of pain and functional limitation as a result of surgery comparing depressed with nondepressed patients. The difference score is similar between groups in all of the three items measured. The depressed group, despite having worse initial and final values of pain and dysfunction, improved in a similar proportion to the nondepressed group.

No statistically significant relationship was found between satisfaction and depression, and 80.3% of the nondepressed group were satisfied with the procedure while 70.6% of the depressed group were satisfied (not significant).

DISCUSSION

The main finding of this study is that depressed and nondepressed patients improve similarly when a surgery for a degenerative lumbar condition is performed. Satisfaction levels with the procedure were found to be similar in both groups, so the initial hypothesis is confirmed.

The results of the present study show a prevalence of depression similar to that already published. The literature shows a prevalence of depression ranging from 20% to 30% in patients with chronic low back pain.[26,27] In the study presented here, the prevalence is 19%.

The results of the present data stand in line with results published by Wahlman et al.[15] They studied the prevalence of depressive symptoms preoperatively and 1 year after lumbar spine fusion surgery. They found that prevalence of depressive symptoms decreased after the surgery, and, similar to our results, the level of pain and functional impairment was higher in the depressed group, but it improved significantly with the procedure. Similar results have recently been published by Wagner et al[16] in a lumbar degenerative surgery study. They found that patients suffering from pronounced psychological distress preoperatively may significantly benefit from surgery.

However, some authors reported a high dissatisfaction rate with surgery for spinal stenosis[13,28] when depression is a concomitant factor. Adogwa et al[8] stated that the extent of preoperative depression influenced the reported patient satisfaction after revision lumbar surgery in a negative way. The fact that this is a revision surgery study and does not include first procedures could make it noncomparable to our study data. In line with Adogwa, other studies[9–11] found that depression was a negative predictor for successful surgical outcomes. However, in some of these studies, they did not consider the overall improvement of different outcomes and just took into account the final values obtained.[9,10] In our series, it can be observed that the initial and final outcomes were worse in depressed patients, but

Table 3. Means and standard deviation at final follow-up of visual analog scale (VAS) and Oswestry Disability Index (ODI) values comparing depressed and nondepressed patients.

	Postoperative Lumbar VAS	Postoperative Radicular VAS	Postoperative ODI
Nondepressed, mean (SD)	3.37 (2.67)	1.38 (2.33)	21.11 (19.24)
Depressed, mean (SD)	4.32 (2.90)	2.74 (3.05)	31.79 (20.97)
P value	n.s.	.02	.03

Abbreviations: n.s., not significant; SD, standard deviation.

Table 4. Difference score (postoperative – preoperative) values of visual analog scale (VAS) and Oswestry Disability Index (ODI) values comparing depressed and nondepressed patients.

	Difference Score Lumbar VAS	Difference Score Radicular VAS	Difference Score ODI
Nondepressed, mean (SD)	−3.34 (3.43)	−5.76 (3.68)	−17.2 (24.16)
Depressed, mean (SD)	−4.23 (3.12)	−5.02 (3.72)	−21.5 (28.38)
P value	n.s.	n.s.	n.s.

Abbreviations: n.s., not significant; SD, standard deviation.

the overall improvement was similar in both groups, suggesting that the benefits obtained by depressed patients do not differ from those obtained by nondepressed patients. This fact could explain high levels of satisfaction in both groups.

Recently, Strom et al[29] published a systematic review recommending tips to improve anxiety and depression in the preoperative and postoperative period to optimize surgical outcomes. They found a relationship between the quality and quantity of information they gave to the patient and the level of anxiety and depression. Similar results were stated by Trief et al.[25] In this author's opinion, it is essential to transmit adequate, understandable information that generates adequate expectations for the procedure. It is also important to identify patients with depressive symptoms preoperatively so that they can be treated before surgery to optimize surgical outcomes.

A limitation of this study is that we must remember that the diagnosis of depression is complex, and we have simplified it with a self-administered test, but studies similar to ours also use these questionnaires. A second limitation is the great diversity of questionnaires that exist, making it difficult to compare between them. The discrepancy in the number of patients should also be taken into consideration; there are many fewer depressed patients. Finally, the inclusion of different degenerative lumbar disorders and different diagnoses in the same study group could also be a limitation.

CONCLUSIONS

The presence of depressive symptoms should not make us exclude elective surgery of the lumbar spine at one or two levels. The overall improvement in the different outcomes studied will not differ significantly from the group without depression. Finally, satisfaction observed does not differ significantly between both groups, although depressed patients are 10% less satisfied.

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