In-Hospital Complications and Resource Utilization Following Lumbar Spine Surgery in Patients with Parkinson Disease: Evaluation of the National Inpatient Sample Database

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■ BACKGROUND: **Previous reports suggest that patients with Parkinson disease (PD) have elevated rates of complications following spine surgery; however, these reports are limited by small patient series. In this study, we used the National Inpatient Sample (NIS) database to compare in-hospital complications following elective lumbar spine surgery in patients with a diagnosis of PD and patients without PD.**

■ METHODS: **The NIS database was accessed to identify patients with PD and those without PD who underwent lumbar spine surgery. All patients identified had a diagnosis code consistent with degenerative lumbar spine pathology. The patients were evaluated for the presence or absence of PD and divided into 4 lumbar spine procedure groups: decompression alone, lateral fusion, posterior fusion, and anterior fusion technique. Propensity score matching (PSM) was performed for the PD versus non-PD patients in each procedure group to control for confounding demographic variables, and in-hospital complications were compared between the 2 groups.**

■ RESULTS: **Between 2001 and 2012, a total of 613,522 lumbar spine surgery patient episodes were identified, of which 4492 (0.7%) involved a diagnosis of PD. Following PSM for patient age, sex, and race, the patients with PD were at increased risk for acute postoperative hemorrhagic anemia, increased blood transfusion requirements, and increased genitourinary, neurologic, and cardiac complications compared with the patients without PD.**

■ CONCLUSIONS: **PSM analysis of the NIS database demonstrated that patients with PD are at increased risk for acute in-hospital complications and greater blood transfusion requirements than those without PD. Surgeons should be aware of the increased risks and differing requirements when treating spinal pathology in patients with PD.**

INTRODUCTION

Parkinson disease (PD), a neurodegenerative disorder resulting from lesions in the basal ganglia, is increasingly prevalent in older adults and is now the second-most common degenerative neurologic disorder in the elderly population.[1] With disease progression, PD results in a functional decline with reduced mobility, typified by a slow, shuffling gait and increased muscular rigidity.[2,3] Despite advances in medical treatment for PD, the natural history of the disease remains one of progressive decline.[4] Patients with PD may also suffer common degenerative disorders that afflict the individuals without PD, including degenerative disorders of

Key words
- Degenerative
- Lumbar spine
- National inpatient sample
- Parkinson disease

Abbreviations and Acronyms
CI: Confidence interval
NIS: National Inpatient Sample
NONPD: Non-Parkinson disease
OR: Odds ratio
PD: Parkinson disease
PSM: Propensity score matching

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the joints and spine. These degenerative conditions can place an added physiological burden on patients with PD, whose mobility is already compromised.

Little data exist on patient outcomes following spine surgery in the PD population.[5-11] The few reports available highlight increased complication rates, increased rates of revision surgery, and increased risk of instrumentation or construct failure in patients with PD.[5-7,9,11,12] Early complications, including infection, have been reported at a rate of almost 20%, whereas other reports suggest a greater risk of poor postoperative outcomes following spine surgery.[12,13] Nonetheless, there remains a relative lack of published information relating to surgical complications and outcomes following spine surgery for patients with PD. In addition, previous reports surgical treatment of spinal pathologies in patients with PD have been limited by small samples.[6,7,9,11-14] Although these previous reports contribute to the knowledge pool, larger database analysis may provide a broader picture with greater generalizability.

In the present study, we used the National Inpatient Sample (NIS) database to evaluate in-hospital complication rates for patients with PD (PD group) and patients without PD (NONPD group) undergoing surgery for lumbar spine degenerative conditions. We hypothesized that compared with the NONPD group, the PD group would have a greater risk for complications following elective lumbar spine surgery.

METHODS

The NIS, an all-payer database available by the US Agency for Healthcare Research and Quality, is the largest database of its type available. Approximately 1000 hospitals across 45 states provide NIS data, representing a 20% sample of nonfederal hospitals nationwide. Approximately 8 million hospital stays are recorded annually. For each discharge, a number of clinical and nonclinical event points are recorded in addition to procedural and diagnostic codes according to the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). Patient demographics, payment sources, discharge status, length of stay, and comorbidity measures are available. Details are available at http://www.hcup-us.ahrq.gov/db/nation/nis/NIS_Introduction_2010.jsp.[15] Because all NIS data are deidentified, this study was exempted from Institutional Research Board review. The STROBE guidelines were adhered to throughout the development and completion of the present study.[16]

Between 2001 and 2012, patients who underwent elective surgical procedures of the lumbar spine, including decompression alone and lateral, posterior fusion procedures or anterior fusion procedures were identified from the NIS database. Patients were included based on ICDM-9-CM codes for specific procedures (722.10, 722.73, 722.52, 724.02, 722.52, 724.3, 738.4, 721.3, and 721.42) and specific diagnoses to ensure that patients with either cervical or thoracic spine pathology were excluded. Admissions with both primary procedure codes corresponding to fusion or decompression and diagnosis codes consistent with lumbar spine pathology were included and then stratified based on the presence or absence of PD (332.0). **Table 1** lists the procedural codes and overall numbers for each cohort. Exclusion criteria included a history of scoliosis, surgery at 4 or more levels, cancer (ICD-9-CM codes 140–239), infection (ICD-9-CM code 730.28), or spinal column fracture (ICD-9-CM codes 805.0–806.9).[17]

Demographic data, including age, sex, and race, were collected for each patient. The occurrence of in-hospital complications was determined for each patient using ICD-9-CM codes specific for individual complications. Complications chosen for analysis were selected based on previous studies that used the NIS database.[17] Because of the overwhelming disparity of numbers between the PD and NONPD groups, a randomly chosen representative subset of patients from the NONPD group was generated for each procedural code and used as a comparison group for the

Table 1. Summary of the Procedures Performed in Each Cohort and the Respective Proportions Undergoing Each Procedure

ICD-9-CM Procedure Code	PD Group (n = 4950), %	NONPD Group (n = 612,972), %
03.09 Other exploration and decompression of spinal canal Decompression: laminectomy, laminotomy Expansile laminoplasty Exploration of spinal nerve root Foraminotomy	57.0	43.3
81.07 Lumbar and lumbosacral fusion, lateral transverse process technique	15.2	15.1
81.08 Lumbar and lumbosacral fusion, posterior technique Arthrodesis of lumbar or lumbosacral region: posterior (interbody) technique, posterolateral technique Posterior lumbar interbody fusion (PLIF) Transforaminal lumbar interbody fusion (TLIF)	37.3	47.3
81.06 Lumbar and lumbosacral fusion, anterior technique Anterior lumbar interbody fusion (ALIF) Arthrodesis of lumbar or lumbosacral region: anterior (interbody) technique, anterolateral technique	5.7	12.1

ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; PD, Parkinson disease; NONPD, non-Parkinson disease.

PD group for analyses that aimed to help adjust for the potentially confounding effects of age, race, and sex.

Statistical Analysis

SPSS version 17 (SPSS, Chicago, Illinois, USA) was used for statistical analyses. Descriptive statistics were used to summarize demographic data and hospital parameters, including length of stay. Propensity score matching (PSM) was performed separately on patient subsets for each of the 4 selected procedural codes, adjusting for age, race, and sex.[18] PSM was performed using R version 3.2.3 (R Foundation for Statistical Computing, Vienna, Austria), with MatchIt, rgenoud, and Matching packages. Following PSM, the potential impact of PD on postoperative variables was analyzed[19,20] using the χ^2 and t tests, with significance defined as $P < 0.05$. Odds ratios (ORs) were used to describe the influence of PD on the risk of complications.

RESULTS

A total of 613,522 patients met our study inclusion criteria, including 4950 patients with PD (0.7% of all lumbar procedures). Before the PSM analysis, compared with the NONPD group, the PD group was older (70.6 years vs. 58.9 years; $P < 0.001$) and had a greater percentage of males (59.3% vs. 46.8%; $P < 0.001$). There were no differences in terms of race between the 2 groups. Following PSM, all evaluated demographic variables were similar in the PD and NONPD groups for each procedure subgroup.

Decompression Alone and Other Exploration and Decompression of Spinal Canal (03.09)

PSM was performed in 2562 patients in the PD group and in 7688 patients in the NONPD group. The mean patient age was 71.8 years in the PD group and 71.9 years in the NONPD group ($P = 0.538$). The percentage of females was 38.1% in the PD group and 37.7% in the NONPD group ($P = 0.698$). There were no significant differences in race distribution between the 2 groups ($P = 0.647$). Patients in the PD group were more likely to have preexisting ischemic heart disease (OR, 1.49; 95% confidence interval [CI], 1.2–1.8; $P < 0.001$), but were less likely to smoke (OR, 0.28; 95% CI, 0.22–0.35; $P < 0.001$) and less likely to be obese (OR, 0.66; 95% CI, 0.54 to 0.82; $P < 0.001$). The risks of acute postoperative hemorrhagic anemia and genitourinary and neurologic complications were greater in the PD group compared with the NONPD group ($P < 0.05$) (Table 2).

Lumbar and Lumbosacral Fusion, Lateral Transverse Process Technique (81.07)

PSM was performed in 684 patients in the PD group and 2066 patients in the NONPD group. The mean age was similar in the 2 groups (69.1 and 69.2 years, respectively; $P = 0.787$). Women accounted for 42.5% of the PD group and 42.3% of the NONPD group ($P = 0.920$). Compared with the NONPD group, the patients in the PD group were more likely to have a history of chronic obstructive pulmonary disease (OR, 1.54; 95% CI, 1.05–2.27; $P = 0.03$) and hypertension (OR, 1.26; 95% CI,

Table 2. Results After Applying PSM for Patients Undergoing Decompression Alone and Other Exploration and Decompression of the Spinal Canal (03.09)

Complication and ICD-9-CM Codes	PD Group, %	NONPD Group, %	OR (95% CI)	*P* Value
Specific postoperative complications				
ARDS (518.5)	0.3	0.3	1.044	0.917
VTE (415.1, 415.11, 451.11, 451.19, 415.2, 451.81, 451.9, 453.40, 453.41, 453.42, 453.9)	0.4	0.3	1.502	0.291
Acute posthemorrhagic anemia (285.1)	**7.2**	**4.8**	**1.531 (1.276–1.837)**	**<0.001**
Hematoma/seroma (998.1–998.13)	1.1	1.2	0.851	0.462
Infection (998.5–998.59)	0.7	0.4	1.550	0.140
Paraplegia	0.5	0.2	1.899	0.077
In-hospital mortality	0.1	0.09	1.286	0.718
Postoperative complications by system				
Cardiac (997.1; 410)	0.7	0.9	0.697	0.179
Respiratory (518.81–518.85; 997.3–997.39)	0.9	0.7	1.160	0.557
Gastrointestinal (997.4)	0.6	0.9	0.691	0.153
Genitourinary (997.5; 584)	**2.3**	**1.3**	**1.877 (1.356–2.598)**	**<0.001**
Nervous system (997.00–997.09)	**1.3**	**0.8**	**1.579 (1.034–2.412)**	**0.033**
Red blood cell transfusion (99.04)	**6.5**	**3.7**	**1.826 (1.499–2.225)**	**<0.001**

Statistically significant findings are highlighted in bold type.
PSM, propensity score matching; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; PD, Parkinson disease; NONPD, non-Parkinson disease; OR, odds ratio; CI, confidence interval; ARDS, adult respiratory distress syndrome; VTE, venous thromboembolism.

1.06–1.50; P = 0.009), but less likely to have a history of smoking (OR, 0.178; 95% CI, 0.12–0.27; P < 0.001) or obesity (OR, 0.62; 95% CI, 0.44–0.88; P = 0.008). The risks of acute respiratory distress syndrome, acute postoperative hemorrhagic anemia, and cardiac and genitourinary complications were also greater in the PD group (P < 0.05) (Table 3).

Lumbar and Lumbosacral Fusion, Including Interbody and Posterolateral Techniques (81.06)

PSM was performed in 1674 patients in the PD group and 5026 patients in the NONPD group. The mean patient age was similar in the 2 groups (68.9 and 69.0 years, respectively; P = 0.688). Sex and race distributions were also similar in the 2 groups. The patients in the PD group were more likely to have a history of ischemic heart disease (OR, 1.76; 95% CI, 1.32–2.34; P < 0.001) and hypertension (OR, 1.28; 95% CI, 1.15–1.43; P < 0.001), but less likely to have a history of smoking (OR, 0.20; 95% CI, 0.15–0.26; P < 0.001) or obesity (OR, 0.63; 95% CI, 0.48–0.82; P < 0.001). The risks of venous thromboembolism, acute postoperative hemorrhagic anemia, hematoma/seroma, and cardiac and genitourinary complications were greater in the PD group (P < 0.05) (Table 4).

Lumbar and Lumbosacral Fusion, Anterior Technique (81.08)

PSM was performed in 258 patients in the PD group and 792 patients in the NONPD group. Patient age as well as sex and race distributions were similar in the 2 groups. Patients in the PD group were less likely to have a preexisting history of diabetes mellitus (OR, 0.35; 95% CI, 0.23–0.53; P < 0.001), smoking (OR, 0.14; 95% CI, 0.07–0.28; P < 0.001), and obesity (OR, 0.46; 95% CI, 0.23–0.91; P = 0.02). Acute postoperative hemorrhagic anemia was more common in the PD group (OR, 2.128; 95% CI, 1.481–3.057; P < 0.05) (Table 5).

DISCUSSION

Previous reports have indicated that surgical treatment of spinal pathology in patients with PD is associated with greater postoperative complication rates compared with patients without PD.[6,7,9,11] Little comparative data exist on acute in-hospital complications for patients with PD and those without PD. In this study, using a large national database and PSM to control for confounding demographic variables, we found that patients with PD were more likely than those without PD to have acute postoperative anemia with associated packed red blood cell transfusion, as well as a greater risk for postoperative in-hospital complications (including genitourinary, cardiac, pulmonary, and neurologic complications) following 4 different elective lumbar spine surgical procedures.

Our findings in this study are consistent with those reported in a recent review by Katus and Shtilbans,[21] who noted an increased risk of genitourinary problems, such as urinary retention, and recommended the avoidance of urinary catheterization and frequent use of bladder scanning to reduce genitourinary complications in patients with PD. Shroeder et al.[12] also reported a high incidence of genitourinary complications following spine surgery in large cohort of patients with PD, including long-term

Table 3. Results After Applying PSM for Patients Undergoing Lateral Lumbar and Lumbosacral Fusion (81.07)

Complication and ICD-9-CM Codes	PD Group, %	NONPD Group, %	OR (95% CI)	*P* Value
Specific postoperative complications				
ARDS (518.5)	**1.3**	**0.1**	**13.760 (2.966–63.841)**	**<0.001**
VTE (415.1, 415.11, 451.11, 451.19, 415.2, 451.81, 451.9, 453.40, 453.41, 453.42, 453.9)	0.1	0.2	0.604	1.000
Acute posthemorrhagic anemia (285.1)	**18.6**	**4.5**	**4.783 (3.605–6.346)**	**<0.001**
Hematoma/seroma (998.1–998.13)	0.6	0.7	0.804	1.000
Infection (998.5–998.59)	0.3	0.1	3.026	0.259
Paraplegia	0.7	0.5	1.514	0.548
In-hospital mortality	0.1	0	—	0.249
Postoperative complications by system				
Cardiac (997.1; 410)	**1.2**	**0.3**	**4.063 (1.405–11.752)**	**0.010**
Respiratory (518.81–518.85; 997.3–997.39)	0.6	0.5	1.099	0.773
Gastrointestinal (997.4)	0.4	1.2	0.360	0.082
Genitourinary (997.5; 584)	**1.5**	**0.5**	**2.772 (1.172–6.555)**	**0.015**
Nervous system (997.00–997.09)	0.1	0.6	0.231	0.211
Red blood cell transfusion (99.04)	**15.8**	**6.1**	**2.863 (2.179–3.761)**	**<0.001**

Statistically significant findings are highlighted in bold type.
PSM, propensity score matching; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; PD, Parkinson disease; NONPD, non-Parkinson disease; OR, odds ratio; CI, confidence interval; ARDS, adult respiratory distress syndrome; VTE, venous thromboembolism.

Table 4. Results After Applying PSM for Patients Undergoing Posterior Procedures Alone (81.06)

Complication and ICD-9-CM Codes	PD Group, %	NONPD Group, %	OR (95% CI)	*P* Value
Specific postoperative complications				
ARDS (518.5)	0.8	0.5	1.687	0.114
VTE (415.1, 415.11, 451.11, 451.19, 415.2, 451.81, 451.9, 453.40, 453.41, 453.42, 453.9)	**1.0**	**0.3**	**3.455 (1.683–7.093)**	**<0.001**
Acute posthemorrhagic anaemia (285.1)	**18.2**	**9.9**	**2.022 (1.732–2.361)**	**<0.001**
Haematoma/seroma (998.1–998.13)	**1.7**	**0.8**	**2.092 (1.299–3.369)**	**0.002**
Infection (998.5–998.59)	0.4	0.4	0.955	0.916
Paraplegia	0.3	0.1	3.008	0.134
In-hospital mortality	0.1	0.1	0.750	1.000
Postoperative complications by system				
Cardiac (997.1; 410)	**1.2**	**0.6**	**1.948 (1.108–3.428)**	**0.018**
Respiratory (518.81–518.85; 997.3–997.39)	0.9	1.1	0.802	0.450
Gastrointestinal (997.4)	1.1	1.5	0.708	0.188
Genitourinary (997.5; 584)	**1.7**	**0.9**	**1.842 (1.147–2.956)**	**0.010**
Nervous system (997.00–997.09)	1.0	0.7	1.460	0.213
Red blood cell transfusion (99.04)	**16.7**	**9.6**	**1.894 (1.615–2.220)**	**<0.001**

Statistically significant findings are highlighted in bold type.
PSM, propensity score matching; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; PD, Parkinson disease; NONPD, non-Parkinson disease; OR, odds ratio; CI, confidence interval; ARDS, adult respiratory distress syndrome; VTE, venous thromboembolism.

Table 5. Results After Applying PSM for Patients Undergoing Anterior Procedures Alone (81.08)

Complication and ICD-9-CM Codes	PD Group, %	NONPD Group, %	OR (95% CI)	*P* Value
Specific postoperative complications				
ARDS (518.5)	1.9	2.5	0.763	0.814
VTE (415.1, 415.11, 451.11, 451.19, 415.2, 451.81, 451.9, 453.40, 453.41, 453.42, 453.9)	0.4	0.6	0.612	1.000
Acute posthemorrhagic anemia (285.1)	**22.5**	**12.0**	**2.128 (1.481–3.057)**	**<0.001**
Hematoma/seroma (998.1–998.13)	1.2	1.8	0.654	0.776
Infection (998.5–998.59)	0.4	0.9	0.436	0.687
Paraplegia	0.8	0.5	1.539	0.639
In-hospital mortality	0	0.4	—	0.697
Postoperative complications by system				
Cardiac (997.1; 410)	1.9	1.1	1.719	0.351
Respiratory (518.81–518.85; 997.3–997.39)	1.2	0.9	1.319	0.714
Gastrointestinal (997.4)	2.3	2.7	0.874	0.774
Genitourinary (997.5; 584)	0.4	1.0	0.381	0.697
Nervous system (997.00–997.09)	0.4	0.4	1.023	0.697
Red blood cell transfusion (99.04)	15.5	14.8	1.059	0.775

Statistically significant findings are highlighted in bold type.
PSM, propensity score matching; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; PD, Parkinson disease; NONPD, non-Parkinson disease; OR, odds ratio; CI, confidence interval; ARDS, adult respiratory distress syndrome; VTE, venous thromboembolism.

urinary catheter placement; however, the authors did not provide a comparison with patients without PD. The reasons for these complications are likely multifactorial, involving a complex interplay of neurologic, pharmacologic, and other factors.[22] Other studies have also reported on the outcomes of spinal surgery in patients with PD, but have focused primarily on longer-term outcomes, particularly construct failure and the need for revision surgery.[5,6,9,13,14] The present study is the first to provide information on the increased risk of in-hospital complications following elective spinal surgery in patients with PD compared with a propensity score-matched cohort of patients without PD.

A novel finding from this study is the increased risk of postoperative hemorrhagic anemia in patients with PD compared with those without PD. To our knowledge, this phenomenon has not been previously reported in the spine literature or in other orthopedic literature. Notably, however, coagulation anomalies in patients taking anti-Parkinsonian medications (including levodopa and dopamine agonists) have been reported previously, and thus is the likely cause of the increased risk of postoperative hemorrhagic anemia in our PD patients. Sato et al.[23] found elevated values of markers of fibrinolysis, including prothrombin time, D-dimer, E-selectin, and creatine kinase, in a PD cohort compared with a control cohort. The authors reported that patients receiving combined medical therapy (levodopa and a dopamine agonist) were most likely to have elevated values. It is likely that there is a selection bias in offering spinal surgery to patients with PD, and that the patients with acceptable baseline function are those taking anti-Parkinsonism medication. Surgical teams need to be aware of this potential for increased bleeding in patients with PD, and also may review their own experience in managing patients with PD as a form of validation. Little data exist on preoperative hematologic management in patients with PD, and further research is warranted.

Previous studies of outcomes following spinal surgery in patients with PD have been limited to small- to medium-sized cohorts, as well as reports on postsurgical outcomes following multilevel surgeries in the thoracic and lumbar spine.[5-7,9,12,14,24] By restricting our inclusion criteria to only elective procedures involving 3 or fewer levels in the lumbar spine, we attempted to limit wide variation in invasiveness. Moon et al.[6] reported the outcomes of 20 patients with PD undergoing fusion procedures of the lumbar spine. Only 1 patient had a good postoperative outcome, and the authors concluded that caution should be taken when considering lumbar fusion in patients with PD. In contrast, Schroeder et al.[12] found that the overall outcomes in patients with PD undergoing lumbar spine surgery were good in those with mild to moderate disease, despite an increased risk of complications. In 96 patients, they noted an incidence of early complications of 6% in noninstrumented cases and 11% in instrumented cases. Bourghli et al.[9] reported 1 case of epidural hematoma in a series of 12 patients with PD undergoing posterior spinal fusion from T2 to the sacrum that necessitated revision surgery. They further reported that 66% of the patients exhibited delirium, and that 1 patient failed to ambulate for 30 days owing to respiratory dysfunction secondary to a pulmonary embolus. In a slightly larger cohort of 23 patients, Koller et al.[5] reported a medical complication rate of 30% and a surgical complication rate of just over 50%. Among the early complications, only 1 (akinetic crisis requiring intensive care) could be clearly considered specific to PD.

Limitations of the present study are similar to those previously noted in studies using the NIS database. The NIS offers only a cross-sectional analysis and does not allow the opportunity to follow-up for out-of-hospital complications or mortality, and also does not allow for correlation with patient outcomes and satisfaction, both of which are important factors in determining whether an intervention is ultimately warranted considering the risk-benefit analysis.[25] Furthermore, patients are deidentified, and individuals with certain characteristics or complications cannot be followed beyond hospital admission. Another important limitation is that although we were able to report on complications by organ system, we were unable to more accurately characterize the specific nature of the complications; for example, a complication recorded as affecting the neurologic system may be a cerebrovascular accident, postoperative weakness due to nerve injury, or delirium that resolves. Accordingly, we also were unable to determine whether a complication resulted in prolonged hospital stay. In addition, the data used for this study rely on accurate coding and diagnosis by the individuals performing the data input, and thus these data are only as accurate as the coding procedure for the corresponding facility.[17,26] A further limitation specific to the present study is the lack of information on PD severity. Classifying disease severity in PD is well established using such systems as Hoehn and Yahr staging.[27] The ability to stratify disease severity could have been useful in determining whether surgeons were selecting "healthier" patients with PD, thereby creating a selection bias. This has been a useful approach in other disease states, such as diabetes, in which controlled and uncontrolled disease states have been compared.[28] Therefore, we cannot exclude the possibility of surgeon selection bias in our analyses of the NIS data used in this study.

CONCLUSION

In summary, using the largest available inpatient database, we found that the presence of PD was associated with an increased risk of in-hospital, postoperative complications, including cardiac, genitourinary, and neurologic complications; acute blood loss anemia; and the resulting need for transfusion of blood products following elective lumbar spine surgery. A multidisciplinary approach is suggested to appropriately manage patients with PD undergoing spine surgery. Future studies should consider reporting hematologic parameters and transfusion requirements along with other outcome measures.

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