

Predictors of Postoperative Discitis Following Surgery for Prolapsed Disc at the National Orthopaedic Hospital Dala Kano Nigeria

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ABSTRACT

Background: Postoperative discitis (POD) is a rare but serious complication following lumbar disc surgery, associated with prolonged hospitalisation, increased morbidity, and significant healthcare costs. This study aimed to identify predictors of POD and its impact on hospital stay following surgery for prolapsed intervertebral disc at a Nigerian tertiary hospital.

Methods: A retrospective cohort study of 197 patients who underwent surgery for prolapsed lumbar disc at the National Orthopaedic Hospital Dala, Kano, from January 2019 to December 2025 was conducted. Patients who developed POD (n=23) were compared with those who did not (n=174). Demographic, clinical, and surgical variables were analysed. Multivariate logistic regression identified independent predictors of POD.

Results: The incidence of POD was 11.7% (23/197). Among affected patients, 16 (69.6%) were male and 7 (30.4%) female. Additional hospitalisation due to POD ranged from 10 to 32 days (mean 18.6±6.4 days). Independent predictors of POD included: age ≥50 years (adjusted OR=4.2, 95% CI: 1.6–11.0), presence of diabetes mellitus (OR=3.8, 95% CI: 1.4–10.2), prolonged operative time >90 minutes (OR=2.9, 95% CI: 1.1–7.6), and modified laminectomy with microdiscectomy (compared with fenestration and microdiscectomy) (OR=3.1, 95% CI: 1.2–8.3). Patients with comorbidities had significantly longer hospital stays (p<0.05).

Conclusions: Postoperative discitis occurs in 11.7% of patients following lumbar disc surgery at our institution. Advanced age, diabetes mellitus, prolonged operative time, and more extensive surgical approaches are independent predictors. Early identification of high-risk patients and targeted preventive strategies are essential to reduce this complication and its associated burden.

KEYWORDS: Postoperative discitis; lumbar disc surgery; risk factors; prolonged hospitalization; Nigeria

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INTRODUCTION

Postoperative discitis (POD), also known as postoperative spondylodiscitis, is an inflammatory and infectious complication affecting the intervertebral disc space following spinal surgery [1]. Although uncommon, it represents a serious complication that can lead to prolonged morbidity, delayed recovery, and substantial healthcare costs [2,3]. The reported incidence of POD following lumbar disc surgery ranges from 0.3% to 5%, though higher rates have been documented in some series [2,4,5].

The pathophysiology of POD is believed to result from intraoperative contamination of the disc space during surgery, rather than haematogenous spread [6]. Factors such as damage to the vertebral endplates during disc space curettage and transmission of skin flora may contribute to its development [7]. In Nigeria and other resource-limited settings, the burden of POD may be higher due to factors such as delayed presentation, limited access to advanced imaging, and constraints on perioperative infection control measures [8].

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Several risk factors for POD have been identified in the literature, including advanced age, diabetes mellitus, smoking, obesity, prolonged operative time, and the presence of Modic type 1 changes on preoperative imaging [4,9,10,11]. A study from Pakistan reported that patients aged ≥ 50 years were at significantly greater risk of developing postoperative discitis, with a relative risk of 196.6 [12]. The same study noted that modified laminectomy with microdiscectomy was associated with a higher incidence of POD compared with fenestration and microdiscectomy [12]. Pre-existing comorbidities such as cardiovascular disease and type 2 diabetes mellitus have also been linked to a higher likelihood of postoperative lumbar spondylodiscitis and extended hospital stays [13].

The impact of POD on patients is substantial. Additional hospitalisation due to POD can range from several weeks to months, with one study reporting a median inpatient stay of 23 days [14]. In a study of surgical treatment for spondylodiscitis, 59% of patients had hospital stays exceeding 21 days, with a mean of 41 days [15]. The economic burden of POD is considerable, particularly in resource-limited settings where healthcare financing is primarily out-of-pocket [16].

At the National Orthopaedic Hospital Dala, Kano, which serves as a major referral centre for spinal disorders in northern Nigeria, the incidence and predictors of POD have not been previously characterised. Understanding the local risk factors for this complication is essential for developing targeted prevention strategies and improving patient outcomes. This study aimed to: (1) determine the incidence of POD following surgery for prolapsed lumbar disc; (2) identify independent predictors of POD; and (3) assess the impact of POD on additional hospitalisation duration.

METHODOLOGY

Study Design and Setting

This was a retrospective cohort study conducted at the National Orthopaedic Hospital Dala, Kano, Nigeria – a 260-bed tertiary orthopaedic referral centre serving northern Nigeria and neighbouring countries. The study period was 1 January 2019 to 31 December 2025. Ethical approval was obtained from the institutional research ethics committee (NOHD/EC/2025/170). Individual patient consent was waived due to the retrospective nature.

Participants

All consecutive adult patients (≥ 18 years) who underwent surgery for prolapsed lumbar intervertebral disc during the study period were eligible. Inclusion criteria: (1) surgery for lumbar disc prolapse confirmed by MRI; (2) complete medical records; (3) minimum 6-month follow-up. Exclusion: patients with pre-existing spinal infection, previous spinal surgery, or incomplete records.

A total of 197 patients met the inclusion criteria. Postoperative discitis was diagnosed in 23 patients (11.7%)

based on clinical features (severe back pain, muscle spasm), laboratory findings (elevated ESR and CRP), and radiological evidence (disc space narrowing, endplate erosion) on follow-up imaging [2,4,17].

Data Collection

Data were extracted from patient case files, operative notes, laboratory records, and imaging reports. Variables collected included: age, sex, body mass index (BMI), diabetes mellitus, hypertension, smoking status, surgical procedure type (fenestration with microdiscectomy vs modified laminectomy with microdiscectomy), operative time, level of surgery, duration of additional hospitalisation due to POD, and time from surgery to symptom onset.

Outcome Measures

The primary outcome was the development of POD. Secondary outcomes included additional hospitalisation duration (days) attributable to POD and predictors of POD.

Statistical Analysis

Data were analysed using SPSS version 26. Continuous variables are presented as mean $\pm$ SD, categorical as frequencies (%). Comparisons between patients with and without POD used independent t-test or Mann-Whitney U for continuous variables, and chi-square or Fisher's exact for categorical variables. Multivariate logistic regression with stepwise forward selection identified independent predictors of POD. Variables with $p < 0.10$ in univariate analysis were entered into the model. Adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. Statistical significance was set at $p < 0.05$.

RESULTS

Patient Characteristics

A total of 197 patients underwent surgery for prolapsed lumbar disc during the study period. The mean age was 46.8 ± 13.4 years; 128 patients (65.0%) were male and 69 (35.0%) female. The most common procedure was fenestration with microdiscectomy (62.4%), followed by modified laminectomy with microdiscectomy (37.6%). Baseline characteristics are shown in Table 1.

Incidence of Postoperative Discitis

Postoperative discitis developed in 23 patients (11.7%). Of these, 16 (69.6%) were male and 7 (30.4%) female. The mean age of patients with POD was 54.2 ± 10.8 years compared with 45.6 ± 13.2 years in those without POD ($p = 0.004$). Table 2 compares characteristics between patients with and without POD.

Additional Hospitalisation

Additional hospitalisation due to POD ranged from 10 to 32 days, with a mean of 18.6 ± 6.4 days and a median of 17 days (IQR: 14–23 days). Patients with comorbidities had significantly longer hospital stays compared with those without comorbidities (21.4 ± 6.8 vs 16.2 ± 5.2 days, $p = 0.03$). Table 3 presents the distribution of additional hospitalisation. Predictors of Postoperative Discitis

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Univariate analysis identified age ≥ 50 years, diabetes mellitus, operative time >90 minutes, modified laminectomy with microdiscectomy, and smoking as factors associated with POD ($p < 0.10$). Multivariate logistic regression (Table 4) retained four independent predictors:

- Age ≥ 50 years: adjusted OR = 4.2 (95% CI: 1.6–11.0), $p = 0.003$
- Diabetes mellitus: adjusted OR = 3.8 (95% CI: 1.4–10.2), $p = 0.008$
- Operative time >90 minutes: adjusted OR = 2.9 (95% CI: 1.1–7.6), $p = 0.03$
- Modified laminectomy with microdiscectomy: adjusted OR = 3.1 (95% CI: 1.2–8.3), $p = 0.02$

Smoking was not significant in the multivariate model. The Hosmer-Lemeshow test showed good model fit ($\chi^2 = 6.8$, $p = 0.56$).

DISCUSSION

This study provides the first comprehensive analysis of postoperative discitis following lumbar disc surgery in a Nigerian tertiary hospital. The incidence of POD (11.7%) is higher than the 0.3–5% reported in most international series [4,5,11]. This elevated rate likely reflects the higher baseline risk in our population, including delayed presentation, limited perioperative infection control resources, and a higher prevalence of comorbidities such as diabetes mellitus [8,13].

Incidence and Patient Demographics

The 11.7% incidence in our cohort is considerably higher than the 1.6% reported in a Korean series of 1,765 patients [2] and the 4.4% reported in a Pakistani study [18]. A study from Pakistan reported an incidence of 6.04% in 182 patients [12]. The higher rate in our setting may be explained by several factors: the absence of routine intraoperative antibiotic disc space lavage, which has been shown to reduce POD from 5.7% to 1.11% [3]; limited use of prophylactic measures such as intradiscal gentamicin wash [19]; and a higher proportion of patients with comorbidities such as diabetes mellitus [13,20]. The male predominance among POD patients (69.6%) is consistent with the literature; a Korean study found that all patients who developed POD following decompression surgery were male [11]. This may reflect higher rates of risk-taking behaviours and poorer glycaemic control among male patients.

Predictors of Postoperative Discitis

Age ≥ 50 years was the strongest predictor (OR = 4.2). Advanced age is associated with reduced immune function, higher rates of comorbidities, and poorer tissue healing [12]. A study from Pakistan found that patients aged ≥ 50 years had a relative risk of 196.6 for developing POD [12]. The association between older age and POD is well-established in the literature [4,10].

Diabetes mellitus (OR = 3.8) is a well-recognised risk factor for surgical site infections, including POD. Hyperglycaemia impairs neutrophil function, compromises wound healing,

and increases susceptibility to bacterial infections [13,20]. The high prevalence of undiagnosed or poorly controlled diabetes in our population likely contributes to the elevated POD rate.

Prolonged operative time >90 minutes (OR = 2.9) increases the duration of wound exposure and the risk of intraoperative contamination [4]. Prolonged surgery also correlates with greater tissue trauma and increased blood loss, which may compromise local immune defences.

Modified laminectomy with microdiscectomy (OR = 3.1) was associated with a higher POD risk compared with fenestration and microdiscectomy. This likely reflects the greater extent of tissue dissection, longer operative time, and more extensive endplate manipulation associated with laminectomy [12]. Surgeons should consider the potential increased infection risk when choosing between surgical approaches.

Additional Hospitalisation

The mean additional hospitalisation of 18.6 days (range 10–32 days) attributable to POD represents a substantial burden on patients and the healthcare system. This is consistent with the median 23-day stay reported in one series [14] and the 21-day threshold exceeded by 59% of patients in another [15]. In a resource-limited setting where out-of-pocket payments predominate, this prolonged hospitalisation imposes catastrophic financial strain on affected families [16].

Comparison with Literature

The finding that patients with comorbidities had longer hospital stays (21.4 vs 16.2 days) aligns with a study that reported pre-existing comorbidities correlate with increased patient age and lengthier hospital stays in patients with POD [13]. The same study found that cardiovascular disease and type 2 diabetes were the predominant comorbidities in affected patients [13].

Strengths and Limitations

This study has several strengths, including a relatively large sample size for a Nigerian cohort and the identification of multiple independent predictors. However, there are limitations. The retrospective design introduces selection and information bias. The single-centre design limits generalisability. The diagnosis of POD relied on clinical and radiological criteria rather than routine culture, which may have under- or over-estimated the true incidence. We did not assess preoperative Modic type 1 changes, which have been identified as a risk factor for POD in other studies [11]. Long-term functional outcomes were not assessed.

Implications for Practice

The findings of this study have several implications for Nigerian spine surgeons:

1. Preoperative risk stratification: Patients aged ≥ 50 years, those with diabetes, and those requiring extensive surgical approaches should be identified as high-risk and managed with enhanced perioperative precautions.

2. Intraoperative prophylaxis: Consideration should be given to intradiscal gentamicin wash, which has been shown to significantly reduce POD incidence [3,19].
3. Glycaemic control: Perioperative optimisation of blood glucose in diabetic patients is essential.
4. Operative efficiency: Efforts to reduce operative time through improved surgical technique and team efficiency may lower POD risk.
5. Enhanced infection control: Strict adherence to aseptic technique, appropriate antibiotic prophylaxis, and careful wound management are critical.

CONCLUSIONS

Postoperative discitis occurs in 11.7% of patients following lumbar disc surgery at the National Orthopaedic Hospital Dala, Kano. Age ≥ 50 years, diabetes mellitus, prolonged operative time, and modified laminectomy with microdiscectomy are independent predictors. Additional hospitalisation due to POD averages 18.6 days, imposing a substantial burden on patients and the healthcare system. Targeted preventive strategies, including preoperative risk stratification, glycaemic optimisation, and consideration of prophylactic measures, are urgently needed to reduce this complication.

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TABLES

Table 1. Baseline Characteristics of 197 Patients Undergoing Surgery for Prolapsed Lumbar Disc

Characteristic	Category	n (%)
Age (years)	Mean±SD	46.8 ± 13.4
	≥50 years	78 (39.6)
Sex	Male	128 (65.0)
	Female	69 (35.0)
Diabetes mellitus	Yes	34 (17.3)
	No	163 (82.7)
Hypertension	Yes	41 (20.8)
	No	156 (79.2)
Smoking	Yes	29 (14.7)
	No	168 (85.3)
Surgical procedure	Fenestration + microdiscectomy	123 (62.4)
	Modified laminectomy + microdiscectomy	74 (37.6)
Operative time	90 minutes	82 (41.6)
	≤90 minutes	115 (58.4)
Level of surgery	L4–L5	112 (56.9)
	L5–S1	63 (32.0)
	Other	22 (11.2)

Table 2. Comparison of Patients With and Without Postoperative Discitis

Variable	POD (n=23)	No POD (n=174)	p-value
Age (years), mean±SD	54.2 ± 10.8	45.6 ± 13.2	0.004
Age ≥50 years, n (%)	18 (78.3)	60 (34.5)	<0.001
Male sex, n (%)	16 (69.6)	112 (64.4)	0.62
Diabetes mellitus, n (%)	10 (43.5)	24 (13.8)	<0.001
Hypertension, n (%)	7 (30.4)	34 (19.5)	0.22
Smoking, n (%)	7 (30.4)	22 (12.6)	0.02

Modified laminectomy + microdiscectomy, n (%) 14 (60.9) 60 (34.5) 0.01
Operative time >90 min, n (%) 16 (69.6) 66 (37.9) 0.004

Table 3. Additional Hospitalisation Due to Postoperative Discitis

Parameter	Value
Total patients with POD	23
Additional hospitalisation (days), mean±SD	18.6 ± 6.4
Range (days)	10 – 32
Median (IQR)	17 (14–23)
By comorbidity status	
With comorbidities (n=12)	21.4 ± 6.8
Without comorbidities (n=11)	16.2 ± 5.2
p-value	0.03

Table 4. Multivariate Logistic Regression – Predictors of Postoperative Discitis

Predictor	Adjusted OR	95% CI	p-value
Age ≥50 years	4.2	1.6 – 11.0	0.003
Diabetes mellitus	3.8	1.4 – 10.2	0.008
Modified laminectomy + microdiscectomy	3.1	1.2 – 8.3	0.02
Operative time >90 minutes	2.9	1.1 – 7.6	0.03
Smoking	2.0	0.7 – 5.7	0.18
Hosmer-Lemeshow goodness-of-fit: $\chi^2=6.8$, p=0.56.			