

Safety of Lumbar Decompression Surgery in Patients Receiving Chronic Oral Anticoagulation: A Propensity Score–Matched Study

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Introduction

With population aging, an increasing number of patients undergoing lumbar decompression surgery receive chronic oral anticoagulation. Although lumbar decompression is considered a high bleeding-risk procedure, evidence regarding perioperative safety in anticoagulated patients remains limited. Spine surgeons therefore face uncertainty regarding bleeding and thromboembolic risks when anticoagulation is temporarily interrupted. This study evaluated the perioperative safety of lumbar decompression surgery in patients receiving chronic oral anticoagulation managed according to contemporary guidelines.

Materials and Methods

A retrospective cohort study was conducted including 502 consecutive patients who underwent one- to three-level microscopic lumbar decompression between 2014 and 2025. Among these, patients receiving antiplatelet therapy without anticoagulation were excluded. The study population therefore consisted of 51 patients receiving chronic oral anticoagulation and 293 non-anticoagulated patients. Oral anticoagulants, including warfarin and direct oral anticoagulants, were temporarily discontinued preoperatively according to guideline recommendations and restarted after drain removal without heparin bridging. Propensity score matching (1:1) was performed for age, sex, and number of decompressed levels to minimize confounding, resulting in 46 matched anticoagulated patients and 46 non-anticoagulated controls. Perioperative outcomes included operative time, estimated blood loss, postoperative drain output, perioperative hemoglobin decrease, blood transfusion, bleeding-related complications, and thromboembolic events.

Results

Forty-six patients receiving oral anticoagulation were successfully matched with 46 non-anticoagulated controls. Mean operative time and estimated blood loss were comparable between groups, with low estimated blood loss observed in both cohorts. Postoperative drain output and hemoglobin decrease on postoperative days 1 and 7 did not differ significantly. Blood transfusion was required in 6.5% of anticoagulated patients and 2.2% of controls. No patient in the anticoagulation group developed postoperative epidural hematoma or other major bleeding complications, while one control patient required hematoma evacuation. No thromboembolic events were observed in either group.

Conclusion

Lumbar decompression surgery can be performed safely in patients receiving chronic oral anticoagulation when managed with temporary interruption according to contemporary guidelines and without heparin bridging. Perioperative bleeding, transfusion rates, and thromboembolic complications were comparable to those in non-anticoagulated patients.

Table 1. Patient characteristics after propensity score matching

	Anticoagulated	Controls	p-value
Age (years)	77.2 ± 6.4	77.3 ± 6.6	0.879
Sex, male	34 (74%)	34 (74%)	1
Female	12 (26%)	12 (26%)	
Body mass index (kg/m²)	23.4 ± 3.7	23.5 ± 3.0	0.932
Levels decompressed			
– 1 level	17 (37%)	17 (37%)	
– 2 levels	22 (48%)	22 (48%)	
– 3 levels	7 (15%)	7 (15%)	
Preoperative hemoglobin (g/dL)	13.0 ± 1.8	13.2 ± 1.5	0.401
Diabetes mellitus	14 (30%)	13 (28%)	0.447
Hypertension	19 (41%)	20 (43%)	0.811
Ischemic heart disease	11 (24%)	4 (9%)	0.056
Valvular heart disease	8 (17%)	2 (4%)	0.011
Cardiac arrhythmia (AF)	32 (70%)	2 (4%)	<0.00001
Chronic kidney disease	16 (35%)	9 (20%)	0.012
Cerebrovascular disease	1 (2%)	0 (0%)	1
Peripheral vascular disease	5 (11%)	1 (2%)	0.115
Congestive heart failure	2 (4%)	0 (0%)	0.495
History of DVT/PE	1 (2%)	0 (0%)	1

AF = atrial fibrillation; DVT = deep vein thrombosis; PE = pulmonary embolism.

Table 2. Perioperative outcomes and complications after propensity score matching

	Anticoagulated	controls	p-value
Operative time (minutes)	134 ± 54	128 ± 44	0.83
Estimated blood loss (mL)	61.1 ± 66.6	53.0 ± 67.4	0.773
Drain output in 24 h (mL)	159 ± 115	168 ± 104	0.414
Total drain output (mL)	295 ± 231	334 ± 253	0.283
Hb drop on POD 1 (g/dL)	1.3 ± 0.9	1.3 ± 0.9	0.961
Hb drop by POD 7 (g/dL)	1.8 ± 1.3	1.8 ± 1.1	0.951
Any blood transfusion	3 (6.5%)	1 (2.2%)	0.617
Postoperative epidural hematoma	0 (0%)	1 (2.2%)	1
Other major bleeding complication	0 (0%)	0 (0%)	—
Thromboembolic complication (DVT/PE/stroke)	0 (0%)	0 (0%)	—

POD = postoperative day; Hb = hemoglobin; RBC = red blood cells; DVT = deep vein thrombosis; PE = pulmonary embolism.