

Comparative Analysis of Prone Lateral versus Single-Position Lateral Decubitus Positioning in Achieving Optimal Outcomes and Reducing Complication Rates in Minimally-Invasive Spine Surgery

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INTRODUCTION:

Recent literature has pointed to the rising use of prone lateral versus lateral decubitus positioning in Minimally-Invasive Spine Surgery (MISS) as a method to reduce operative time, increase patient safety, and aid in surgical accessibility. However, there is a paucity of literature as to how prone lateral and lateral decubitus positioning compares in terms of reaching optimal postoperative outcomes and reducing complication rates. The purpose of this study was to assess differences between prone lateral and single-position lateral decubitus positioning compares in terms of reaching optimal postoperative outcomes and reducing complication rates.

METHODS:

MISS patients with BL) and 2-year(2Y) postop radiographic/HRQL data were included. Patients positioned in the Prone Latera (PL) or single-position Lateral Decubitus (LD) position were isolated. At 2Y, an optimal outcome score was calculated using 4 equally weighted criteria: 1) achieving ideal PT per SRS-Schwab at 2Y, 2) Achieving ideal PI-LL per SRS-Schwab at 2Y, 3) No complication requiring reoperation 4) Achieving NRS MCID by Salaffi et al. criteria; optimal score threshold was set at meeting 2 of 4 criteria. Means comparison analysis assessed differences in radiographic and clinical outcomes at BL and 1Y post-op. ANCOVA assessed estimated marginal means adjusting for BL age and revision status.

RESULTS:

34 Prone Lateral and 36 Lateral Decubitus patients were included (54.40±12.49 years, 40% female, 30.93±6.52 kg/m², mean CCI: 2.23±1.55) were included. At baseline, patients were comparable in age, gender, BMI, and CCI (all p>.05). Peri-operatively, PL patients demonstrated significantly lower operative time (200.09 vs 284.54 min, p=.007) and EBL (332.35 vs 192.05 mL, p=.027). Though optimization scores were equivalent between groups (p=.160), PL patients demonstrated significantly lower peri-operative complication rates (p=.012), neurological complication rates (p=.006), and had a fewer number of total complications by 2Y (p=.014). When controlling for BL age and revision status, the PL patients demonstrated consistently intra- and peri-operative complications as well (both p<.015). In terms of patient-reported outcomes, PL patients also demonstrated significantly improved NRS-Leg scores compared to LD patients by 1Y (p=.038).

DISCUSSION AND CONCLUSION:

Patients placed in the Prone Lateral position during minimally-invasive adult spinal deformity surgery demonstrate decreased mean operative times and decreased intraoperative invasiveness and blood loss versus patients operated on via single-position Lateral Decubitus positioning. Though overall rates of achieving optimal outcome remain comparable, Prone Lateral approach should be considered as there may be significant additional benefit in reducing peri- and post-operative complications by 2Y.