Patient-centered Outcomes Following Prone Lateral Single-Position Approach to Same-Day Circumferential Spine Surgery

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INTRODUCTION: Prone-lateral(PL) single positioning has recently gained popularity in spine surgery due to lower blood loss and operative time, but has yet to be examined for other notable outcomes, including realignment and patient-reported measures. The purpose of this study is to evaluate surgical characteristics and postoperative 2-year results of the prone lateral circumferential approach to spinal fusion

METHODS: **We included** Circumferential spine fusion patients with up to two-year(2Y) followup. Patients were stratified into two groups based on undergoing PL approach versus same-day flipped(Flipped). Means comparison tests identified differences in baseline parameters. Multivariable logistic regression, controlling for age, levels fused, and Charlson Comorbidity Index(CCI) was used to determine the influence of approach on complication rates, radiographic and patient-reported outcomes up to two years.

RESULTS: 122 patients were included. 72(59%) same-day staged and 50(41%) PL. PL patients were older with lower BMI(both p<.05). Patients undergoing PL procedures had lower EBL and operative time(both p<.001), along with fewer osteotomies(63% vs. 91%,p<.001). This translated to a shorter length of stay(3.8 days vs. 4.9,p=.041). There were no radiographic differences preoperatively or postoperatively between groups(all p>.2). PL procedures demonstrated better correction in both PT and PI-LL(both p<.02). PL procedures were more likely to improve in GAP relative pelvic version(OR: 2.3,[1.5-8.8];p=.003]. PL patients suffered less complications during the perioperative period and greater improvement in NRS-Back(-6.0 vs. -3.3,p=.031), with less reoperations(0.0% vs. 4.8%,p=.040) by two years.

DISCUSSION AND CONCLUSION: Patients undergoing prone lateral single position procedures received less invasive procedures with better correction of pelvic compensation, as well as earlier discharge. The prone lateral cohort also demonstrated greater clinical improvement and lower rate of reoperations by two years following spinal corrective surgery.

Table 4. Radiographic Outcome Comparison Between Prone Lateral and Flipped

Parameter	Prone Lateral	Flipped	p-value
Radiographic Assessment			
Lumbar Lordosis	3.2 ± 7.3	1.9 ± 8.6	.531
PI-LL	-3.7 ± 8.0	3.1 ± 12.1	**.012**
GAP Relative Lumbar Lordosis	-0.51	-0.41	.757
Sacral Slope	0.9 ± 5.8	-1.9 ± 4.8	.071
GAP Relative Pelvic Version	-0.28	0.53	**.018**
Pelvic Tilt	-0.2 ± 4.9	4.0 ± 8.7	**.033**