Does Diminishing Length of Stay results in Improved Outcomes? Cost Benefit Analysis of Patient Outcomes with Differences in Disposition after Adult Spinal Deformity Surgery

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INTRODUCTION: Entry into rehabilitation center has often been touted as an optimal recovery environment after surgical procedures. However, patient outcome differences between inpatient rehabilitation and increased hospital stay postoperatively have yet to be studied after adult spinal deformity surgery.

METHODS: Operative ASD patients with 2Y data were included. Patients stratified into those discharged to rehabilitation (Rehab) or had increased hospital stay (Hosp). Threshold for defining high LOS based on expected LOS from CMS Risk Adjusted Rate (Actual/Expected Rate * National Observed Rate). National Observed Rate set to 50% per guidelines. Those ≥ 6.4d included in Hosp. Cost analysis based on average Medicare reimbursement while accounting for surgical invasiveness and revision status. Reimbursement consisted of standardized estimate by regression analysis of Medicare pay-scales for services within 30 days, standardized to New York, inflation adjusted to 2023. Utility was calculated by ODI to SF-6D using published conversion. QALYs utilized 3% discount for life expectancy (78.7 years). ANCOVA and logistic regression assessed outcomes accounting for invasiveness, age, and frailty between groups.

RESULTS: 273 were included (Age: 58.8 yrs, 50.6%F, BMI: 31.5kg/m2, CCI: 3.9), with mean LOS of 4.7 days. 75 (27.4%) were in Hosp group, 61 (22.3%) entering Rehab. Osteotomies, levels fused, and baseline deformity (SVA, PI-LL, PT, GAP) were similar between groups (all p>.05). Age was lower for Hosp (57.8 vs 63.6, p=.012). Rehab had higher odds of less severe deformity with “0” Schwab PI-LL (OR 3.23 [1.57, 2.25] p=.039), but was comparable in SVA and PT by 2 years. Hosp had lower cardiopulmonary and neurological complications by 2 years (OR: 1.76, p<.05). However, they had higher rates of reoperation in 30d (1.5% vs 0.6%) and 90d (20% vs 10%) that reversed at 2 years (4% vs 9%, p<.001). Odds of readmission by 2 years were significantly greater for Rehab (0% vs 15%, OR: 2.12, p=.023). For major complications the rates were similar, with Rehab having lower rates of mechanical complications by 30d (.5% vs .98%) and 90d (6% vs 2%, p =.04) but comparable at 2 years (23% vs 18%, p=.07). Despite comparable MCID in ODI, MCID in SRS Total had higher odds in Hosp group (OR: 2.77, p=.009), particularly in SRS Mental score (OR: 3.27, p<.001) indicating better mental health with longer hospital stays. Hosp had higher mean cost of $33,877.60 at $3,609 a day, while Rehab had mean of $18,563 at $1,600 a day (p=.02). However, cost utility was comparable ($64,736.29 vs $48,176.62, p=.055).

DISCUSSION AND CONCLUSION: With increasing focus on healthcare expenditure, it is of importance to determine how policies such as minimizing hospital stay postoperatively affects long-term management and cost. Our study aimed to quantify differences in outcomes dependent on discharge disposition. Despite greater mean cost, patients staying in the hospital longer than expected had lower overall complications and readmission rates at 2 years, thus indicating its potential in the postoperative period for cost-saving and improved patient outcomes.