Impact of Enhanced Recovery After Surgery in Minimally Invasive Spine Surgery

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INTRODUCTION: Enhanced recovery after surgery protocols has been used to improve patient outcomes in spine surgery. The exact extent it has improved outcomes has yet to be determined and can help guide postoperative protocols.

METHODS: Patients ≥18yrs-70yrs with complete pre-(BL) and up to 2-year(2Y) postop radiographic/HRQL data were stratified by enrollment in Standard-of-Care ERAS beginning in 2020. Differences in demographics, clinical outcomes, radiographic alignment, peri-operative factors and complication rates were assessed via means comparison analysis. Multivariate regression was used to assess difference in outcomes.

RESULTS: 590 patients were included with 387 meeting inclusion criteria (age 53.8, 43% female, BMI 31.5, CCI 2.28, mFI 0.24). 193 patients had ERAS protocol while 150 did not, with age and baseline disability in mobility (odi walking) being greater in ERAS cohort ($p<.05$). Greater baseline deformity was present in E cohort (PT 25.6 vs 22.1, $p=.052$, PI-LL 17.2 vs 14.2, $p=.32$, SVA 71.2 vs 65.4, $p=.32$). E cohort had greater number of levels fused (4.55 vs 4.02, $p=.375$) and interbodies placed (3.07 vs 2.63, $p=.143$). Operative time was lower in E (304 vs 384, $p<.001$), with less SICU admissions (14% vs 19%, $p=.289$), and decreased length of stay (2.5 days vs 3.1 days, $p=0.191$). E cohort presented with more back pain at baseline (NRS-Back 8.28 vs 7.16, $p=.001$), and had no difference in pain immediately postoperatively (NRS-back 6w 7.31 vs 7.33, $p=.983$), yet by 3m presented with less back pain (4.85 vs 5.94, $p=.127$). No difference in baseline leg pain between ERAS and NE (NRS-Leg 6.85 vs 6.65, $p=.703$), yet leg pain was significantly improved perioperatively till 6 months post op ($p<.044$), with no difference in leg pain between groups thereafter. This translated to lower opioid usage from baseline till 1 year for E with better. Controlling for levels fused, E group had significantly higher distance ambulated postoperatively (165ft vs 85ft, $p<.001$). MCID rates were higher at 3 months in E (46.1% vs 42.4%, $p=.82$), however after 6 months rates of MCID were similar. Multivariate regression controlling for baseline characteristics depicted those that had ERAS to be 5.3x more likely to achieve MCID by 6 months (OR: 5.3 [1.4-20.7], $p=0.016$).

DISCUSSION AND CONCLUSION: ERAS protocol is a multifaceted approach with the end goal of improving patient care. Our study has shown that it can lead to an improved postoperative course with greater improvement in pain, which resulted in lower opioid use, and return to baseline.