

Rapid Recovery Pathway Utilizing Intrathecal Morphine Improves Quality of Care in Adolescent Idiopathic Scoliosis and Decreases Overall Hospital Costs

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INTRODUCTION: Posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) is a complicated procedure that can cost more than \$150,000. Inpatient and intensive unit care contributed 22% of these total costs. To enhance patient care after scoliosis surgery, numerous institutions have implemented rapid recovery pathways (RRP). The majority of RRP's promote early ambulation, feeding, and stooling along with patient-controlled analgesia (PCA). This study seeks to determine the effects of a multimodal RRP, that combines intrathecal morphine (ITM) with oral pain medication, on hospital costs and patient management. We hypothesize that the use of a standardized RRP utilizing multimodal analgesia without PCA will enhance the quality of patient care, reduce opioid consumption, and cost less than traditional PCA methods.

METHODS: Patients with AIS who underwent PSF between 2013 and 2022 were retrospectively reviewed. Patients after February 2018 were assigned to the RRP group. ITM was administered to these patients as part of their multimodal analgesia. Fusion level-matched control patients, treated before February 2018, received hydromorphone PCA as their primary postoperative pain treatment. At discharge, PCA patients received oxycodone prescriptions for 14 days, while ITM patients received prescriptions for 7 days. McNemar's and Wilcoxon Signed-Rank tests were used to compare perioperative data, requests for opioid refills, and total costs.

RESULTS:

A total of 659 patients were included (PCA: 255, RRP/ITM: 108). BMI ($p = 0.786$) and median preoperative Cobb angle ($p = 0.343$) were similar between both groups. RRP patients had a significantly shorter length of stay (3 days vs. 5 days, $p < 0.001$). In total, 65.2% of RRP patients ambulated by postoperative day (POD) 1 compared to 43.4% of PCA patients ($p < 0.001$). The fraction of patients who requested opioid refills was similar between both groups ($p = 0.082$).

The cost of intraoperative anesthesia was significantly higher for RRP patients (\$2,286.87 vs. \$1,958.70, $p < 0.001$). Perioperative hospital stay (\$39,990.00 vs. \$55,680.00, $p < 0.001$) was significantly lower for the RRP patients. Due to different prescription durations, the cost of home opioid medications was \$98.94 for PCA patients versus \$56.28 for RRP, based on standard Medicaid costs.

DISCUSSION AND CONCLUSION: Our RRP pathway, which integrates micro dose ITM injections at the time of surgery, allows for optimal perioperative management, improved costs, and overall better outcomes than the conventional PCA approach. This is crucial considering growing concerns about opioid dependence and rising hospital costs.