Effect of an Enhanced Recovery After Surgery Pathway for Living Donor Nephrectomy Patients

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Introduction: Perioperative care in the United States is often costly and fragmented. A number of studies have demonstrated that enhanced recovery after surgery (ERAS) programs reduce morbidity, hospital costs, and length of hospital stay[1], however there have been no documented ERAS protocols for living donor nephrectomy patients assessing effectiveness in this patient population. The concept of the Perioperative Surgical Home (PSH) advances upon ERAS by placing these multi-component care pathways into a system of care that spans the period from decision to discharge.[2] In partnership with kidney transplant surgeons at our institution, we developed and incorporated an ERAS pathway for living donor nephrectomies through our existing PSH known as our Perioperative Consult Service (PCS).

Methods: After IRB approval, records were obtained for all living donor nephrectomies (2/07/2013 - 1/28/2016). All patients undergoing a living donor nephrectomy performed by a kidney transplant surgeon as identified by their primary procedural surgical code were included. Post implementation of our ERAS pathway, all living donor nephrectomy patients were included unless had allergy to medication in protocol, contraindication to regional anesthesia, or patient refusal. Patient ASA classification, gender and BMI were obtained, along with morphine equivalents. Length of stay was abstracted from hospital billing records.

Results: 142 charts were reviewed; 113 were pre implementation of our protocol (2/07/2013 – 7/27/2015) and 29 were post implementation (7/28/2015 – 1/28/20016). There was no difference in ASA classification or gender, BMI, or preoperative morphine equivalents between the two groups. All procedures were performed laparoscopically. Intraoperative and Post Anesthesia Care Unit morphine equivalents were significantly reduced between pre and post implementation of protocol (39.21 vs 4.38, $P < 0.001$ and 7.24 vs 2.54, $p < 0.001$ respectively). Mean and median length of stay was decreased between pre and post implementation phases: 2.84 vs 2.27, $p<0.001$ and 2.48 vs 2.34, respectively. Prior to implementation, only 55% of patients were discharged prior to POD3, whereas after implementation, 93% were discharged prior to POD ($P<0.001$), with some patients going home on POD1. Readmission events within 30 days, although higher in the post implementation group, were extremely low for both groups: 0/113 pre implementation vs 2/29 post implementation (one for nausea and one for abdominal pain) and emergency department visit events were 1/113 pre implementation (fever) vs 2/29 post implementation (one for nausea and one for chest pain). There were no rapid responses or postoperative ICU admissions in either group.

Conclusion: The living donor nephrectomy ERAS pathway development and implementation by our PCS significantly shortened median length of stay and decreased perioperative opiate use in living donor nephrectomy surgery patients. Of note, if we are able to sustain these changes, we will be able to liberate approximately 40 bed-days per year even from this lower volume service. Future directions will involve applying ERAS principles to kidney transplant recipients.