Title

Development of a Novel Enhanced Recovery After Surgery Pathway for Major Lower Extremity Amputation

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Abstract

Objectives

Enhanced recovery after surgery (ERAS) pathways are evidence-based, multidisciplinary perioperative treatment programs designed to accelerate postoperative recovery times and reduce complications. ERAS pathways have shown to improve the quality of care, decrease cost, and shorten length of stay for a variety of surgical patient populations including gastrointestinal surgery, surgical oncology, gynecologic, and orthopedic operations.

Patients undergoing major lower extremity amputation typically have significant postoperative pain and delayed return to baseline level of functioning. Despite an awareness of these perioperative issues, the utilization of ERAS pathways has been limited for patients undergoing major lower extremity amputation. We aimed to develop an ERAS pathway for the treatment of patients undergoing above- or below-knee amputation in an attempt to improve the quality of care for this at-risk patient population.

Methods

We conducted a systematic review of all published English-language literature to identify and characterize ERAS pathways. Our search was performed using Medline and Cochrane databases. Search terms included 'ERAS' 'enhanced recovery', 'fast-track recovery', 'recovery pathway', 'postoperative care', 'multi-modal analgesia', 'amputation', 'postoperative pain', 'phantom limb pain', and 'length of stay'. The purpose of this review was to identify and review relevant literature and to use this data to develop a novel ERAS pathway for patients undergoing major lower extremity amputation.

Results

Literature review of ERAS pathways specific to vascular surgery resulted in no relevant publications. Universal ERAS concepts including preoperative education, multimodal analgesia, antibiotic prophylaxis, and early postoperative physical mobility were used as a starting point for the development of a novel ERAS pathway for limb amputation at our institution. Key elements of this novel ERAS pathway for limb amputation included: 1) detailed preoperative patient education on perioperative expectations and the typical recovery process 2) preoperative oral analgesics (acetaminophen, pregabalin, duloxetine) and placement of peripheral nerve catheters in the lower extremity on the day of surgery 3) pre-incision antibiotic prophylaxis 4) intraoperative multi-modal, opioid sparing anesthesia technique while avoiding general anesthesia when possible 5) postoperative multimodal analgesic regimen, limited opioid use, and consultation of our anesthesiology acute pain management team 6) early nutrition, mobility, and evaluation by our physical medicine and rehabilitation team postoperatively 7) education regarding limb guard, stump shrinkers and prosthetics follow-up and 8) evaluation for phantom limb pain prior to hospital discharge.

Conclusions

We developed a novel ERAS pathway for treatment of patients undergoing major lower extremity amputation. This protocol has been implemented at our institution and future studies will compare pre- and post-ERAS protocol implementation periods to examine outcomes of length of stay, surgical pain, phantom limb pain, and time to ambulation. Based upon these results, we will continue to refine and adapt our pathway to meet the needs of patients undergoing major lower extremity amputation.