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Reduced Length of Stay in Major Hepatectomy Surgery After Implementation of an Enhanced Recovery Pathway in U.S. Veterans

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Background
Enhanced Recovery After Surgery (ERAS) protocols have been shown to improve the postoperative recovery of patients undergoing many types of surgeries[1]. However, evidence is lacking for ERAS pathways in major liver surgery, which is associated with significant postoperative pain and complications [2, 3]. This data is especially lacking in the United States (U.S.) veteran population [4].

Materials and Methods Continued

Our inclusion criteria incorporated all patients over the age of 18 who underwent an open hepatectomy. Exclusion criteria were procedures with additional non-hepatopectomy resections and death during hospital course. A total of 24 patients were evaluated. Nine completed the ERAS pathway versus fifteen in the traditional group. Patient demographic information was collected including age (years) and American Society of Anesthesiology Class (ASA 1-4).

Pre-operative components of the protocol included patient education, avoidance of bowel preparation, and consumption of clear carbohydrate drinks until two hours prior to surgery. All patients without contraindication received regional anesthesia. Patients received bilateral continuous erector spinae plane (ESP) blocks. Intra-operative measures included standardized anesthetic management, goal directed fluid therapy, and minimizing the use of intravenous opiates. Post-operative components included avoidance of nasogastric tubes, encouragement of liquids immediately after surgery, and early ambulation. The primary outcome was postoperative LOS. Secondary outcomes were perioperative oral morphine equivalents. We tested for differences between patients using two-tailed Mann-Whitney U tests.

Results
There was a clinically significant reduction in LOS in the ERAS group (7.2 days +/- 4.7) compared to traditional care (11.2 days +/- 7.2, p=0.06). Patients in the ERAS group used significantly less intraoperative opioids (63.9 mg +/- 34.3) than the control group (104.7mg +/- 38.7, p=0.01).

Conclusion
The ERAS group also used significantly less postoperative narcotics (152.7 mg +/- 60) than the control group (335.9 mg +/- 240, p=0.003). Patient controlled analgesia (PCA) was required for 73% of the traditional patients compared to 0% in the ERAS group (p=0.00009).

References

Image 1: Hunter Holmes McGuire VA Medical Center

Image 2: Ultrasound approach to ESP

Figure 1: incidence of Cancer in Males

Figure 2: Cancer Related Mortality Rates in Males

Figure 3: Enhanced Recovery After Surgery Components

Graph 1: Length of Stay, Controls vs ERAS Groups

Graph 2: Perioperative Narcotic Use

Graph 3: Postoperative Dilaudid PCE use

Purpose
This study aimed to evaluate the impact of an ERAS pathway in U.S. veterans undergoing major hepatectomy surgery. We hypothesized that the adoption of an ERAS pathway reduces decreased length of stay (LOS) and perioperative narcotic usage.

Materials and Methods
After approval from the Hunter Holmes McGuire VA Medical Center IRB, we compared data from consecutive patients undergoing elective open hepatectomy within an ERAS pathway (January 2019-December 2019) to a previous cohort of patients before introduction of ERAS (July 2016-December 2017). One surgeon performed all the procedures.
Introduction/Background

Purpose: Impact of an ERAS pathway in U.S. veterans undergoing major hepatectomy surgery
Methods

- Patient education,
- Avoidance of bowel preparation
- Consumption of clear carbohydrate drinks until two hours prior to surgery
- Regional Anesthesia

Intra-operative

- Goal directed fluid therapy
- Standardized anesthetic management
- Minimizing the use of intravenous opiates

Post-operative

- Avoidance of nasogastric tubes
- Encouragement of liquids immediately after surgery
- Early ambulation

Figure 3: Enhanced Recovery After Surgery Components

Image 2: Ultrasound approach to ESP
Results

Graph 1: Length of Stay, Controls vs ERAS Groups
Results

Graph 2: Perioperative Narcotic Use

Graph 3: Postoperative Dilaudid PCA use
Discussion and Conclusion

- Decreased hospital LOS
- Decreased perioperative opioid consumption
- Novel use of ERAS in US veteran population
- Quality Improvement
- Continuous ESP catheters for open hepatectomy