Liver Resection Enhanced Recovery After Surgery (ERAS): Utilising PQIP data to demonstrate improvement

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Introduction

Enhanced Recovery After Surgery (ERAS) is an evidence-based, multimodal pathway, which aims to improve postoperative outcomes and patient experience of the perioperative period [1,2]. Examination of liver resection PQIP data indicated that Royal Free Hospital patients experience longer than national average length of stay (LOS). Adopting a multidisciplinary team approach, a Liver Resection ERAS protocol was designed and piloted, targeting improvement in postoperative morbidity and LOS of 5 days.

Methods

The Liver Resection ERAS protocol was developed with input from; anaesthetic, surgical, preoperative assessment, intensive care and ward teams, as well as nutritionists, physiotherapists and pharmacists. The anaesthetic and surgical teams ran education sessions, to all stakeholders, introducing the pathway ahead of the pilot.

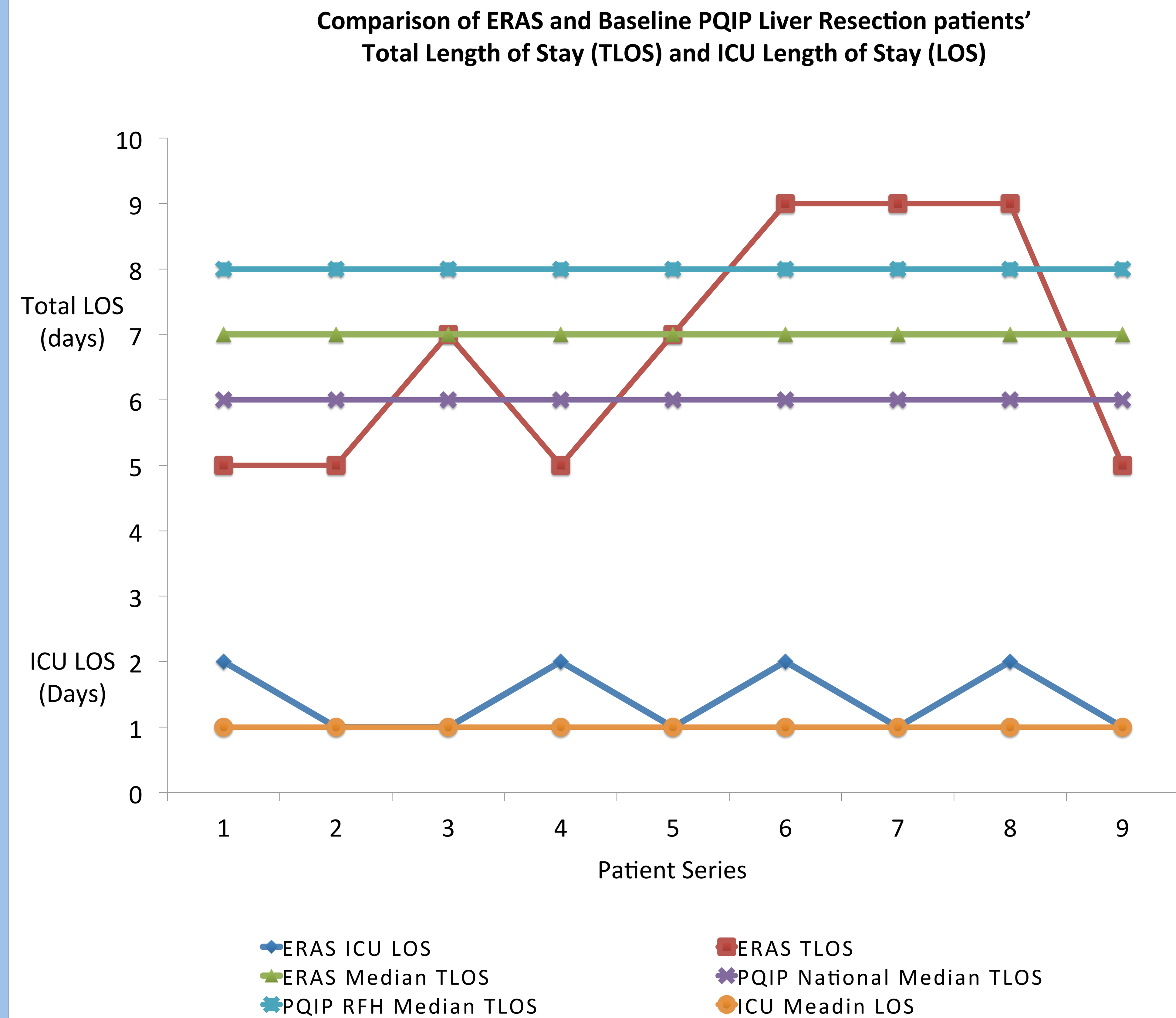
The pilot was run for two-weeks, from the 25th of February to the 1st of March, to assess the pathway in preoperative, intraoperative and postoperative settings. Feedback from staff and patients was collected across the entire mapped pathway, alongside data on Intensive Care Unit (ICU) LOS, Total LOS (TLOS) and postoperative morbidity, until discharge.

Results

Nine patients scheduled for liver resections were included in data analysis. Extent of surgery varied from a single segment resection to complex hemi-hepatectomy.

- ERAS Median TLOS = 7 days (mean LOS was 6.7)
- ERAS ICU median LOS = 1 day
- PQIP RFH median TLOS = 8 days (mean LOS 10.6)[3]
- PQIP National median TLOS = 6 days [3]
- No PQIP ICU LOS data.

Of the Liver Resection ERAS patients, one developed a postoperative collection requiring drainage and another required a re-laparotomy for division of adhesions, resulting in LOS of 9 days.



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Hepatic Resection Enhanced Recovery After Surgery (ERAS) Pathway

CONSULTANT LED OUTPATIENT CLINIC

- Introduce to HPB CNS / ERAS nurse + provide contact details
- Complete Preoperative Assessment (POA) screening tool (POA Nurse ± Consultant Anaesthetist review)
- Send to walk-round POA or arrange Nurse ± Con
- Ensure the relevant blood tests (e.g. cancer marker patients to take to POA
- Offer ERAS education session on the same day
- Provide patient with ERAS resource pack

PREOPERATIVE ASS

- Ensure routine blood tests (FBC, U&E, LFTs, clotti
- Request further tests as indicated:
  - haematinics in patients with anaemia (Hb <1
  - NT pro-BNP in patients with limited functiona
  - HbA1C in diabetic patients
  - TFTs in patients with thyroid disease
- Ensure 2 samples sent for group & screen and ch
- Arrange for optimisation with IV iron if confirme Anaemia Pathway)
- Complete Surgical Risk Score
- Complete Frailty Assessment (refer to social servi
- Complete Nutritional Screen and document nutri nutritional supplements BD for 7 days pre-op)
- Review all medications and give advice on stoppi Anticoagulation Clinic for a bridging protocol as
- Give written instructions about pre-operative fast
  - solid diet up to 6 hours pre-operatively
  - encourage clear liquids (including carbohydra
  - supply pre-operative carbohydrate drinks
- Inform the anaesthetist, surgeon and CNS if any note on Cerner)
- Ensure post-operative critical care bed is organise
- Give advice about what clothes to bring in and w and mobilisation)

Enhanced recovery patient record card
Hepatic resection

12 hours following surgery

Date Time

YOUR GOALS

- Bed exercises – sit on edge of bed if able
- Drink fluids freely
- Breathing exercises
- Leg exercises

Checklist for nursing

Please take into consideration the patients' clinical status at all times, where necessary deviations can be made following discussion with the consultant responsible for the patient at the time.
Please clearly record any deviations in the notes.

Day 0 **Date:**

- ☐ Unrestricted fluids and diet
- ☐ Oral nutritional supplements BD if high risk on nutritional screen
- ☐ Encourage deep breathing and supported coughing if necessary every hour when awake
- ☐ Sit on the edge of the bed within 6-12 hours
- ☐ VTE prophylaxis
- ☐ Analgesia as per postoperative bundle
- ☐ All regular medications to be re-prescribed unless contraindicated
- ☐ Review discharge criteria

Please document variances

Print name: Sign:

Day 1 **Date:**

- ☐ Physiotherapy review
- ☐ Unrestricted fluids and diet
- ☐ Oral nutritional supplements TDS if high risk on nutritional screen
- ☐ Encourage deep breathing and supported coughing if necessary every hour
- ☐ Discontinue IV maintenance fluids
- ☐ Analgesia as per postoperative bundle
- ☐ Remove urinary catheter if sited (unless written documentation to retain)
- ☐ Remove central line (if still in situ)
- ☐ Sitting out of bed for all meals including breakfast
- ☐ Minimum of one active mobilisation aiming for one lap of the ward
- ☐ Review discharge criteria

INTRAOPERATIVE MEDICATION BUNDLE:

ANALGESIA:

Options

1. Thoracic Epidural Analgesia (TEA) Bolus: 0.1-0.2mls/kg 0.125% bupivacaine + 4mcg/ml Fentanyl (bag mix); infusion 6-15 mls/hr bag mix titrated to effect
2. Intrathecal opiates 4-15mcg/kg diamorphine (max 1mg) +/- 0.5% heavy bupivacaine
3. Wound infiltration catheter (between peritoneum & muscle layer) plain Bupivacaine 0.375% fixed rate 5ml/hr for up to 3 days please note dose for patients over 50kg's

Conclusion

Successful implementation of Liver Resection ERAS requires patient engagement and multidisciplinary collaboration. This pilot demonstrated the need for further patient and staff education, and development of additional pathways for low nutritional and high frailty status. Although sample size was limited, initial indications of ERAS efficacy are good, with a reduction in Total Length of Stay of 1 day, in comparison to RFH baseline PQIP data.

References

1. Ljungqvist O, Scott M, Fearon KC, Enhanced Recovery After Surgery: A Review. JAMA Surg. 2017;152(3):292-298.
2. Melloul E, Hübner M, Scott M, et al Guidelines for Perioperative Care for Liver Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations World J Surg. 2016 (10):2425-40.
3. PQIP Royal Free Hospital Annual report, October 2017 - November 2018