FP01 - FREE PAPER SESSION 1 (LIVER)

FP01-01

INITIAL PER OPERATIVE FLUID RESTRICTION AS A PART OF GOAL-ORIENTED FLUID MANAGEMENT PROTOCOL FOR LIVER RESECTIONS IS NOT ASSOCIATED WITH POST OPERATIVE ORGAN DYSFUNCTION

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Background: Modern per operative fluid management protocols for liver resections are goal-oriented. Initial fluid restriction during mobilization and parenchymal dissection may be used to lower down central venous pressure (≤5mmHg) and cardiac preload, aiming at preventing venous back bleeding. Final fluid restoration with high administration rate normalizes intravascular volume and aims to secure proper organ perfusion and haemostasis control at the end of operation. Effective fluid restriction at administration rate as low as 1 mL/kg/hour may lead to temporary reduced organ perfusion pressure and postoperative organ dysfunction.

Study design: Consecutive patients resected for colorectal liver metastases between January 2018 and December 2022 at Uppsala University Hospital in Sweden were per operatively managed according to a goal-oriented fluid management protocol with initial fluid restriction. Those patients were reviewed retrospectively for organ hypoperfusion adverse effects: acute kidney injury (AKI), major adverse cardiac events (MACE) and clinically significant venous thromboembolism (TE).

Results: During the study period 390 patients were operated with 444 liver resections. Patients age was 69 [61;75] years (median [IQR]), BMI 25 [23;29] and 159 (36%) patients had ASA score ≥3. A total of 110 (25%) major liver resections and 28 (6%) laparoscopic minor resections were performed. Median operation time was 181 [135;264] min, intraoperative blood loss was 300 [100;600] mL. Median intraoperative fluid administration rate was 7.8 [6.0;10.3] mL/kg/hour, with an observed weight gain of 1.7 [0.5;2.7] kg at post operative day one. AKI occurred in 6 (1%) patients, MACE in 0 (0%) patients and TE in 11 (3%). Major complications defined as Dindo-Clavien ≥3b were observed 35 (8%) patients and 90-day mortality was 0.9%.

Neither low administration rates or total amount of fluids given were associated to post operative AKI, MACE or TE.

Conclusion: Goal-oriented fluid management during liver resections with initial fluid restriction at low administration rates followed by fluid restoration appears safe and is not associated to renal, cardiovascular and thromboembolic complications.

FP01-02

DOES ENHANCED RECOVERY PROGRAMS IN LIVER SURGERY IMPACT SURVIVAL? THE PRESTIGE PROSPECTIVE STUDY COHORT

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Introduction: Significant advancements in the management of patients undergoing liver surgery (LS) have been achieved; however, postoperative morbidity remains a key determinant of long-term survival. The enhanced recovery program (ERP), a multimodal, evidence-based care protocol, aims to mitigate the physiological stress induced by surgery, with robust evidence supporting a dose-response relationship between compliance and improved clinical outcomes. This study investigates the association between high compliance with ERP protocols and overall survival (OS) following LS.

Method: This prospective multicenter cohort study compared OS among patients with high ERP compliance (≥70%, defined as adherence to at least 15 of 21 protocol items) to those with low compliance (<70%). Data were collected from french and belgian tertiary centers between 2019 and 2024 participating to the PRESTIGE Cohort (*erP incReasE Survival afTer lIver surGEry)*.

Results: Of 360 patients included, 153 (42.6%) exhibited high ERP compliance. Kaplan-Meier OS estimates at 1, 3, and 5 years were 97%, 91%, and 70% in the high compliance group, compared to 89%, 67%, and 45% in the low compliance group ($p < 0.001$). High ERP compliance was independently associated with reduced mortality risk (HR: 0.05, 95% CI: 0.27−0.93, p = 0.028). Conversely, severe weight loss (HR: 7.8, 95% CI: 1.55−39.8, p = 0.013) and higher ASA scores (ASA-2: HR: 7.8, 95% CI: 1.1−58.2, p = 0.045; ASA-3: HR: 11.4, 95% CI: 1.5−85.9, p = 0.018) were significantly associated with increased mortality.

Conclusion: High compliance with ERP protocols significantly enhances long-term survival following liver surgery, underscoring the importance of implementing structured perioperative care strategies. Conversely, severe

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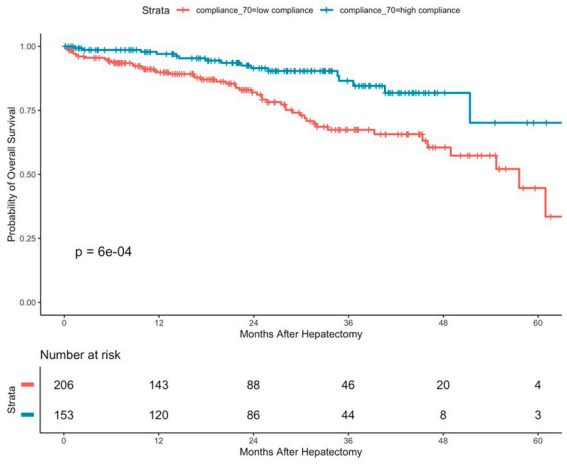
weight loss and elevated ASA scores serve as critical predictors of poorer outcomes.



FP01-03

CONVERSION TO OPEN SURGERY FOLLOWING ROBOTIC LIVER SURGERY IN A FRENCH NATIONAL COHORT

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Introduction: Robotic-assisted surgery offers distinct advantages, including enhanced precision and improved ergonomics, driving the adoption of Robotic-assisted liver surgery (RLS) as a promising surgical approach.

Learning curves are widely employed to evaluate performance improvements over time, with conversion to open surgery (OC) as a measurable and relevant endpoint.

This study aims to identify factors influencing OC and evaluate learning curve dynamics in a multicenter French cohort.

Method: Patients undergoing RLS between 2010 and 2024 across 10 French tertiary HPB centers were included in the ACHBT-FRIES (French Robotic Liver Surgery) cohort. All centres had previous laparoscopic liver surgery experience.

Predictors of OC were identified through univariable and multivariable regression analyses, adjusting for confounders. Key variables included surgical complexity, defined by the Institut Mutualiste Montsouris (IMM) classification (IMM 1−3), and the frequency of RLS procedures (weekly or less frequent).

Learning curve effects were analyzed using cumulative sum (CUSUM) analysis to identify performance trends and milestones, stratified by surgical difficulty and procedural frequency.

Results: A total of 617 patients underwent RLS during the study period, with 10.4% (n = 64) requiring OC.

Multivariable analysis identified prior surgical history (OR: 2.01, 95% CI: 1.02−4.01, p = 0.046) and surgical complexity (IMM 2: OR: 3.09, 95% CI: 1.36−7.14, p = 0.007; IMM 3: OR: 3.46, 95% CI: 1.57−7.84, p = 0.002) as independent predictors of OC. The frequency of RLS procedures (weekly or less frequent) was not significantly associated with OC risk.

CUSUM analysis revealed that learning curves were achieved after 41 procedures, with 35 cases for weekly procedures and 47 cases for less frequent procedures. When stratified by surgical complexity, learning milestones were reached 51 procedures for IMM 1 cases and 58 procedures for IMM 2 and IMM 3 cases.

Conclusion: This study highlights the significant impact of surgical complexity and prior surgical history on the likelihood of conversion to open surgery in RLS, rather than procedural frequency. Learning curve analysis underscores the importance of procedural frequency and volume for high-complexity cases, in achieving proficiency.

Structured training programs with case selection strategies are essential to minimize conversion rates and improve outcomes in RLS.