

Emergency General Surgery

Practice Management Guidelines: Cirrhosis

I. Purpose: Patients with cirrhosis who require emergency general surgery have significantly higher morbidity and mortality rates than patients without cirrhosis [1]. While data on outcomes and risk prognostication remain limited in this population, this document outlines perioperative management considerations for the cirrhotic patient.

II. Guideline:

A. Initial evaluation of the cirrhotic patient with EGS pathology

a. Liver disease stratification scores

- i. MELD 3.0: INR, total bilirubin, Creatinine, albumin, Na, age, sex
- ii. Child-Pugh: INR, total bilirubin, albumin + ascites + hepatic encephalopathy

b. Imaging review for sequelae of portal hypertension including abdominal wall varices, splenomegaly, ascites

c. Postoperative risk scores

- i. Patients with MELD>20 or Child-Pugh class C have a high risk of postoperative decompensation and death. However, there is no absolute cutoff to exclude a patient from surgery, and prognostication is patient dependent. [2]
- ii. There are several risk scores available to aid in prognostication:
 1. POTTER: <https://apps.apple.com/us/app/potter/id1364985773>
 2. Mayo Postoperative Mortality Risk Score:
<https://www.mayoclinic.org/medical-professionals/transplant-medicine/calculators/post-operative-mortality-risk-in-patients-with-cirrhosis/itt-20434721>
 3. VOCAL-Penn Cirrhosis Surgical Risk Score:
<https://www.vocalpennscore.com/>

B. Preoperative correction of coagulopathy

a. INR

- i. Do not attempt to reverse INR unless there is active bleeding or the patient is taking a vitamin K antagonist [3]

- b. Platelets
 - i. Do not administer preoperative platelet transfusion unless there is evidence of active bleeding or platelet count <30,000 [4]
 - ii. Hold preoperative DVT prophylaxis if platelet count <50,000 [5]
- c. Fibrinogen
 - i. Transfuse cryoprecipitate to goal >100 before emergency surgery [2] or if active bleeding [1], [3]
- d. TEG
 - i. If available expeditiously, use TEG to direct resuscitation and minimize perioperative transfusion needs [6]

C. Cholecystitis in the cirrhotic patient

a. Imaging workup

- i. Right upper quadrant ultrasound (RUQUS) will often show a thickened gallbladder wall from portal hypertension-related congestion and/or pericholecystic fluid from ascites. These findings are not confirmatory for acute cholecystitis.
- ii. Obtain HIDA if RUQUS/CT are nondiagnostic regardless of MELD score. This may require delayed images up to 24 hours. [7]
- iii. Obtain MRCP if HIDA is non-diagnostic and/or there is concurrent concern for biliary obstruction.

b. Treatment

- i. MELD \leq 13 or Child Pugh A or B: antibiotics plus laparoscopic cholecystectomy [8] [9]
- ii. MELD >13 or Child Pugh C or decompensated cirrhosis:
 - 1. Do not offer cholecystectomy
 - 2. Start with antibiotic therapy alone
 - 3. If the patient fails antibiotic therapy alone, consult both IR and GI for multidisciplinary discussion of percutaneous cholecystostomy versus advanced endoscopic management [8] [10]:
 - a. If patient has ascites: avoid percutaneous cholecystostomy and engage GI for advanced endoscopic options

- c. **Transplant surgery consult** instead of EGS if the patient is on the transplant list, has history of HCC, or has a TIPS

D. Post-operative management

a. Hepatic encephalopathy (HE)

- i. Chronic diagnosis: resume home regimen with po tolerance

- ii. New diagnosis with symptoms concerning for HE:
 - 1. Check ammonia level; do not need to trend if high
 - 2. Start lactulose (20g or 30 mL po BID-TID), titrate to 2-3 bowel movements/day [11]
 - 3. Add rifaximin (550mg po BID) if poor response to lactulose
- iii. If po intolerance: use lactulose enemas instead q4-6 hours
- iv. Hepatology consult if encephalopathy is refractory to above medications

b. Ascites

- i. Diuretics
 - 1. Resume home diuretic regimen when hemodynamics and renal function allow
 - 2. If initiating new medication regimen [12]:
 - a. Spironolactone as first agent: 100mg daily oral, can titrate to 400mg q24 hours oral
 - b. Furosemide as second agent: 40mg daily oral, can titrate to 160mg q24 hours oral
- ii. Surgical drain if present
 - 1. Drain emptying frequency
 - a. Q4 hours for 72 hours
 - b. Remove as soon as possible after 72 hours if ascites medically controlled [11]
 - 2. Albumin replacement
 - a. Replace each liter of ascites drained with 6g of 25% albumin
 - 3. SBP prophylaxis
 - a. Should be continued while drain is in place if the patient has already completed intra-abdominal sepsis coverage
 - i. Oral: ciprofloxacin 500mg q24 hours
 - ii. IV: ceftriaxone 1g q24 hours
- iii. Large-volume paracentesis (LVP) if no surgical drain
 - 1. Indications
 - a. Ascites leakage from surgical incisions
 - b. Concern for bacterial peritonitis
 - c. Inability to start diuretics due to hemodynamic concerns or renal function
 - 2. Albumin replacement
 - a. If LVP is performed removing >5 L, 25% albumin infusion at a dose of 6–8 g/L of ascites drained should be administered [11]
- iv. Hepatology consult if ascites unresponsive to diuretics

c. Prophylactic anticoagulation

- i. Start if platelet count >50,000 [5]
- ii. If CrCl>30ml/min: enoxaparin 40mg daily
- iii. If CrCl<30ml/min: subcutaneous heparin 5,000 units q8 hours

d. Fluid management

- i. Use balanced crystalloid (plasmalyte or lactated ringer's) rather than normal saline to reduce risk of hyperchloremic acidosis and renal injury [11]

e. Common postoperative medications

- i. Opiates: reduce dosing and lengthen intervals due to delayed clearance [2]
 - 1. Start with Oxycodone 2.5-5mg q6 hours
 - 2. Start with IV Hydromorphone 0.125-0.25mg q6 hours
- ii. Acetaminophen is safe up to 2g daily [2]
 - 1. Dose either 500mg q6 or 650mg TID
- iii. Avoid NSAIDS due to risk of renal injury [2]
- iv. Avoid benzodiazepines due to delayed hepatic clearance [2]

f. SBP prophylaxis

- i. Indications
 - 1. Home regimen: Continue patients on home SBP prophylaxis once antibiotics for intra-abdominal sepsis are completed
 - 2. Intraperitoneal ascites drain in place [13]
 - 3. For high-risk cirrhotic patients, start on SBP prophylaxis if [14]:
 - a. Prior history of SBP
 - b. Ascites fluid with low protein (<1.5g/L)
 - c. Child Pugh class C
 - d. Renal dysfunction (Cr >1.2, BUN >25, Na <130)
 - e. Active GI bleeding
- ii. Therapy options [14]
 - 1. Oral ciprofloxacin 500mg q24 hours
 - 2. IV ceftriaxone 1g q24 hours if po intolerance [2]

E. Indications for perioperative hepatology consult

- a. Assistance with decompensated cirrhosis management including refractory ascites/encephalopathy or GI bleeding
- b. Evaluation for TIPS (transjugular intrahepatic portosystemic shunt) for refractory ascites
- c. Liver transplant evaluation for acute liver failure
- d. Long-term management of portal vein thrombosis

III. References

1. Bleszynski, M.S., et al., *Acute care and emergency general surgery in patients with chronic liver disease: how can we optimize perioperative care? A review of the literature*. *World J Emerg Surg*, 2018. **13**: p. 32.
2. Northup, P.G., L.S. Friedman, and P.S. Kamath, *AGA Clinical Practice Update on Surgical Risk Assessment and Perioperative Management in Cirrhosis: Expert Review*. *Clin Gastroenterol Hepatol*, 2019. **17**(4): p. 595-606.
3. Kaltenbach, M.G. and N. Mahmud, *Assessing the risk of surgery in patients with cirrhosis*. *Hepatol Commun*, 2023. **7**(4).
4. Northup, P.G., et al., *Vascular Liver Disorders, Portal Vein Thrombosis, and Procedural Bleeding in Patients With Liver Disease: 2020 Practice Guidance by the American Association for the Study of Liver Diseases*. *Hepatology*, 2021. **73**(1): p. 366-413.
5. Simonetto, D.A., et al., *ACG Clinical Guideline: Disorders of the Hepatic and Mesenteric Circulation*. *Am J Gastroenterol*, 2020. **115**(1): p. 18-40.
6. De Pietri, L., et al., *Thrombelastography-guided blood product use before invasive procedures in cirrhosis with severe coagulopathy: A randomized, controlled trial*. *Hepatology*, 2016. **63**(2): p. 566-73.
7. Ziessman, H.A., *Nuclear medicine hepatobiliary imaging*. *Clin Gastroenterol Hepatol*, 2010. **8**(2): p. 111-6.
8. Wang, S.Y., et al., *Management of Gallstones and Acute Cholecystitis in Patients with Liver Cirrhosis: What Should We Consider When Performing Surgery?* *Gut Liver*, 2021. **15**(4): p. 517-527.
9. Delis, S., et al., *Laparoscopic cholecystectomy in cirrhotic patients: the value of MELD score and Child-Pugh classification in predicting outcome*. *Surg Endosc*, 2010. **24**(2): p. 407-12.
10. Hanna, K., et al., *Non-operative management of cirrhotic patients with acute calculous cholecystitis: How effective is it?* *Am J Surg*, 2023. **226**(5): p. 668-674.
11. Seshadri, A., et al., *Management of Decompensated Cirrhosis in the Surgical ICU: an American Association for the Surgery of Trauma Critical Care Committee Clinical Consensus Document*. *Trauma Surg Acute Care Open*, 2022. **7**(1): p. e000936.
12. Aithal, G.P., et al., *Guidelines on the management of ascites in cirrhosis*. *Gut*, 2021. **70**(1): p. 9-29.
13. Macken, L., et al., *Palliative long-term abdominal drains for the management of refractory ascites due to cirrhosis: a consensus document*. *Frontline Gastroenterol*, 2022. **13**(e1): p. e116-e125.
14. Biggins, S.W., et al., *Diagnosis, Evaluation, and Management of Ascites, Spontaneous Bacterial Peritonitis and Hepatorenal Syndrome: 2021 Practice Guidance by the American Association for the Study of Liver Diseases*. *Hepatology*, 2021. **74**(2): p. 1014-1048.

Authors:

Stefanie P. Lazow, MD

Michael C. Smith, MD

Michael Derickson, MD

Andrew Medvecz, MD

October 28, 2024