Elective surgery in cirrhotic patients, when to operate, when to manage conservatively

> Martin Brand Department of Surgery University of Pretoria



Agenda

- Background
- Surgical planning
- Pre-operative optimisation
- Post operative complications
- Conclusion
- Must reads

• Useful applications



Background

- CTP-A is 10%,CTP-B is 30% and CTP-C is 76–82%
- The reasons for poor outcomes:
 - hyperdynamic circulation and increased output
 - decreased hepatic perfusion, vulnerable to hypoxemia and hypotension
 - vulnerable to bacterial infection, bleeding and to poor wound healing
- 30% cirrhotic patients have postoperative complication: postoperative ascites, encephalopathy, renal failure, bleeding and infection.
- LOS nearly double in AAA repair CTP-A patients with cirrhosis compared with non-cirrhotics
- Risk factors for poor outcome include:
 - pre-operative platelet transfusion
 - intra-operative blood transfusion
 - intraoperative blood loss>500 mL
 - CP score
 - serum albumin
 - INR



Surgical planning

Determine the degree of liver cirrhosis?

What is the extent of the proposed general surgical procedure?

What are the risks of not operating on the patient?



Determining the degree of liver cirrhosis



Classifying the severity of liver disease

ASA

- subjective system: "mild" and "severe" systemic disease not specifically defined
- not specific to liver disease and does not allow for portal hypertension or nutritional status

ASA Physical Status 1: A normal healthy patient
ASA Physical Status 2: A patient with mild systemic disease
ASA Physical Status 3: A patient with severe systemic disease
ASA Physical Status 4: A patient with severe systemic disease that is a constant threat to life
ASA Physical Status 5: A moribund patient who is not expected to survive without the operation

ASA Physical Status 6: A declared brain dead patient whose organs are being removed for donor purposes



- Child Pugh Score
 - criticized because it allows a wide variation of liver metabolic function in each group, especially CP-B group.
 - allows clinicians to underestimate or overestimate liver function
 - Doesn't consider portal hypertension
 - CP A patients with portal hypertension, mortality rates = CP-B patients
- Criticisms
 - Subjectivity: binary response of "yes" or "no"
 - 2 parameters are relatively subjective as to severity (encephalopathy and ascites),
 - Doesn't include renal function
 - Doesn't include age



• MELD

- serum bilirubin, INR, creatinine
- accounts for renal function
- objective: a weighting to each variable
- linear relationship to mortality: mortality rises by 1% for each MELD point below 20, 2% for higher MELD scores
- MELD above a threshold of 8–14 predicts a poor outcome with intraabdominal surgery



Comparing CP-score to MELD score

 1 and 3 month mortality rates in emergency and elective surgical interventions in known cirrhotic patients. There was good overall correlation between the CTP and MELD scores (r =0.76)

Peng et al. 2012

 Mortality correlation greater in the emergency surgery group than in the elective surgery group (r =0.81 and r =0.65 respectively)

Farnsworth et al. 2013



- Mayo Clinic Model
 - ASA, CTP, MELD, older age and emergency versus elective surgery
 - no patients under 30yo died, and a higher mortality occurred in those over age 70 years.
 - Online calculator: http://www.mayoclinic.org/meld/mayomodel9.html

Teh et al. 2007



What is the extent of the proposed general surgical procedure?



Type of surgery

- Abdominal or gastrointestinal surgery possibly has the worst outcomes
- A large study of patients with predominantly alcoholic cirrhosis, looked at elective abdominal surgery outcomes
- Overall In-hospital mortality: 28%

-	CP-A:	10%
-	CP-B:	17%
-	CP-C:	63%
_	MELD <10:	9%
-	MELD 10–15:	19%
-	MELD >15:	54%

- Laparoscopic cholecystectomy low risk:
 - CTP-A patients
 - CTP-B without significant portal hypertension

Shaik et al. 2009



Other surgery

- 24 patients with cirrhosis having elective repair of infra-renal aortic aneurysm there were no perioperative deaths
 - 2 CTP-B and none were CTP-C.
 - both CP-B patients (MELD>10) died within 6 months
- A review of 62 head & neck surgery px
 - 30% mortality among CP-B (17 cases) and CP-C (n=3) px
 - 4.8% in the 42 CP-A px

Marrocco-Trischitta et al. 2011

Kao et al. 2010

- An analysis of 9 cardiac surgery studies (210px)
 - CP-A 5% (6/118)
 - CP-B 32.2% (19/59)
 - CP-C 67% (6/9)

Modi et al. 2010



Pre-operative optimization

- Patients, especially in the Child Pugh B group may be optimized preoperatively to improve their operability. (Abbas et al.)
- Specific factors include (Pandey et al):
 - Protein-energy malnutrition may be corrected in an attempt to decrease infections, wound dehiscence, ascites and mortality
 - Coagulopathy
 - Electrolyte correction, especially sodium imbalance and renal dysfunction
 - Gut decontamination with lactulose and oral metronidazole



- Pre-procedural portosystemic shunting
 - D. Azoulay et al. Neoadjuvant transjugular intrahepatic portosystemic shunt: a solution for extrahepatic abdominal operation in cirrhotic patients with severe portal hypertension. J Am Coll Surg, 193 (1) 2001: 46-51
 - G. Moulin et al. TIPS for portal decompression to allow palliative treatment of adenocarcinoma of the esophagus. Cardiovasc Intervent Radiol, 18 (3) 1995: 186-188
 - Gil A et al. The role of transjugular intrahepatic portosystemic shunt prior to abdominal tumoral surgery in cirrhotic patients with portal hypertension. EJSO 30 (1), 2004:46-52



Post-operative management

- Most common complications
 - Encephalopathy
 - Ascites
 - Infection
 - Bleeding
 - NB: complications may occur several days or a few weeks postoperatively
- Management principles
 - Salt restriction
 - Avoid hypotension
 - Prevent constipation
 - Monitor analgesic requirements
 - Avoid drugs metabolized by cytochrome P450 enzymes



Laparoscopic cholecystectomy

- Meta-analysis (Laurence et al.):
 - increased overall morbidity rate, 21% versus 6%
 - increased rate of intra-operative hemorrhage, 26% versus 3
 - increased need for conversion to an open cholecystectomy, 7% versus 4%
 - no difference in all-cause mortality.

Tips

- Do not to place the umbilical port first
- Recurrent acute cholecystitis and CP-B & CP-C cirrhosis should not have a cholecystectomy: cholecystostomy tube +/- endoscopic cystic duct drain



Umbilical herniorrhaphy

- The most common hernia in cirrhotic patients
- Conservative management: 77% required an emergency repair, 15% mortality rate. (Coelho et al.)
- Increased incidence of surgical site infection in the mesh group compared to the primary tissue repair group, 16% versus 9%. (all were managed conservatively.)
- At 6 month follow-up there was an increased recurrence rate in the primary repair group versus mesh group of 14% versus 3%.
- OR for hernia recurrence 8.5 if a shunt was not placed. (Kasl et al.)
- In conclusion, umbilical hernias in cirrhotic patients should be repaired electively using mesh following placement of a shunt if there is significant ascites.



What are the risks of not operating on the patient?



- common sense
- surgical experience
- conservative measures are not always an option
 - failure of the measure may still require surgery
 - expedient infective source control may not be possible
 - time delay may result in inoperable patient
- multi-disciplinary team approach
- appropriate counseling of the patient and their family members is imperative



Conclusion

- Determine the degree of cirrhosis
 - CP-A consider surgery
 - Except if there is portal hypertension
 - CP-B:
 - if early B, optimise and consider surgery
 - late B, consider conservative mx
 - Any CP-B with portal hypertension, consider conservative mx
 - CP-C avoid surgery, conservative/ palliative treatment



Must reads

Teh SH et al. **Risk factors for mortality after surgery in patients with cirrhosi**s. Gastroenterology2007;132:1261–9

Abbas N et al. **Perioperative Care of Patients With Liver Cirrhosis: A Review.** Health Serv Insights. 2017; 10: 1178632917691270



Useful applications

MDCalc

https://www.mdcalc.com/meld-score-model-end-stage-liverdisease-12-older

Mayo Clinic Model http://www.mayoclinic.org/meld/mayomodel9.html



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Thank you

martin.brand@up.ac.za

