Gordhan & PARTNERS
Specialist Surgeons

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Pre-operative biliary drainage

Introduction

- Consequences of obstructive jaundice:
  - Impaired glycogen metabolism
  - Impaired hepatic and renal functions
  - Decreased cell-mediated immunity
  - Increased circulating endotoxins
  - Depressed synthesis of homeostasis factors

- Pre-operative drainage aims to correct these
- Drawbacks -> complications associated with biliary drainage:
  - biliary stent-induced bacterial contamination
  - Risk of cholangitis
  - Inflammatory response in the bile duct - increased risk of anastomotic failure

Consequences of jaundice

Complications from drainage

Special considerations

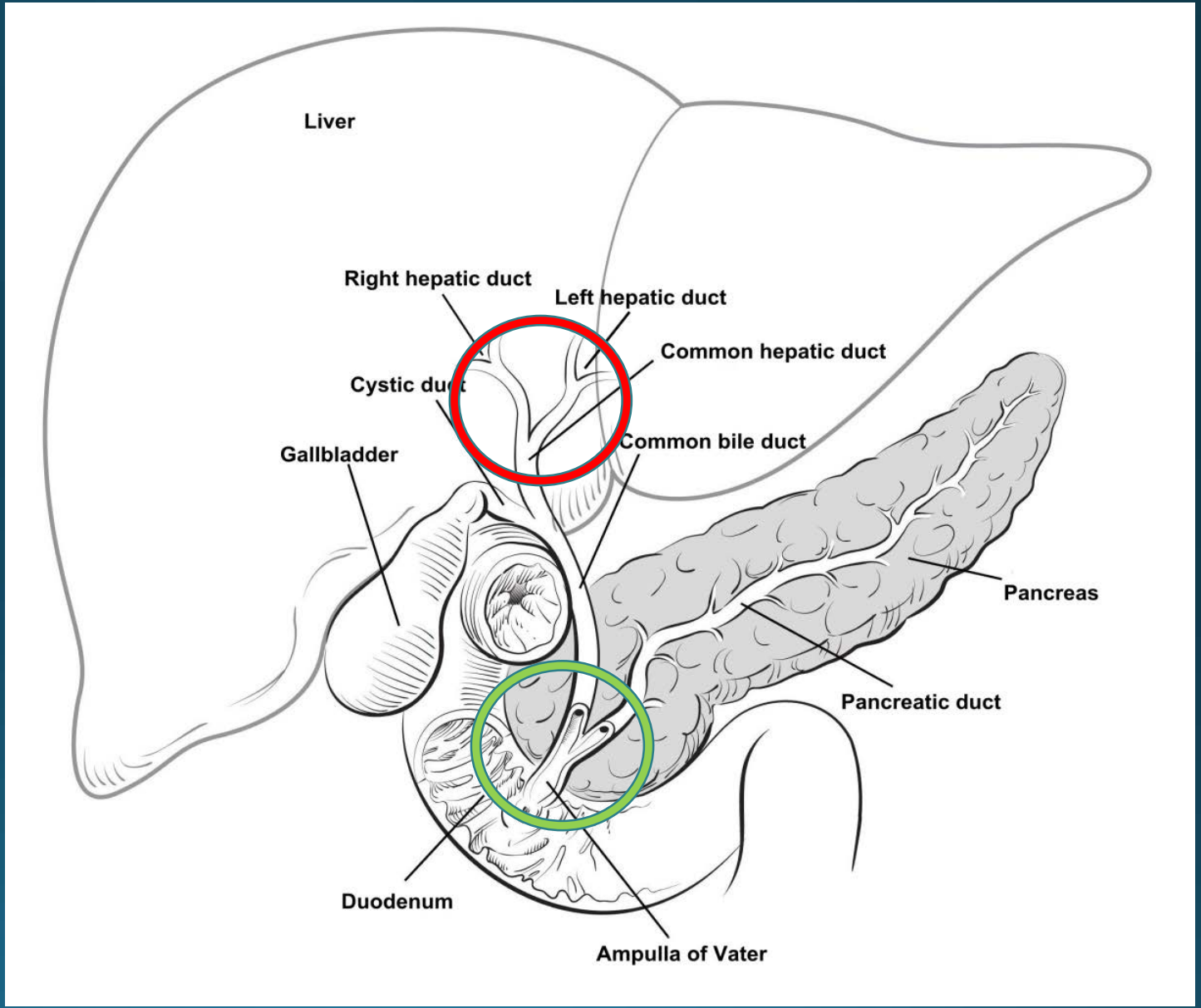
- Absolute indications
- Level of biliary obstruction
  - Proximal vs distal
- Type of drainage
  - Internal vs external
  - Metal vs Plastic
- Evidence
- Guidelines

Absolute indications

- Consensus:
  - Presence of cholangitis
  - Presence of severe pruritis
  - Very high bilirubin at presentation
  - Poor nutritional state at presentation

- Others:
  - Consideration for neo-adjuvant chemotherapy for down-staging
  - Long interval anticipated between stenting and surgery
  - Diagnostic uncertainty

Proximal vs distal



Differences

Proximal

- More diagnostic uncertainty
- Sampling without biliary intubation often not possible
- Spyglass possible investigation of choice
- Non-invasive techniques possible but mostly not diagnostic
- Treatment often based on clinical suspicion
- Close relationship between outcome and hepatocyte function of FLR

Distal

- Less diagnostic uncertainty
- Sampling without biliary intubation norm
- EUS investigation of choice
- Treatment often based on histological confirmation

Types of drainage procedures

Internal

- ERCP and stenting, nasobiliary drainage tubes, endoscopic ultrasound guided catheter placement
- Advantages – restores enterohepatic bile circulation
- Disadvantage – higher rate of bacterial contamination and biliary sepsis

External

- Percutaneous cholangiogram catheters, T-tubes
- Advantages – lower rate of biliary bacterial contamination
- Disadvantage – often more invasive, experienced interventional radiologist

Percutaneous vs endoscopic

- **Preoperative Biliary Drainage in Patients with Resectable Perihilar Cholangiocarcinoma: Is Percutaneous Transhepatic Biliary Drainage Safer and More Effective than Endoscopic Biliary Drainage? A Meta-Analysis.** Al Mahjoub A[1], et al
- J Vasc Interv Radiol. 2017 Apr;28(4):576-582.
- Conclusions: This meta-analysis shows that PTBD has a lower rate of complications than EBD as the initial procedure to perform preoperative biliary drainage in resectable PHCC. PTBD is associated with less conversion and lower rates of pancreatitis and cholangitis.
- **Await results from the DRAINAGE procedure.**

Metal or plastic stent

- **Systematic review and meta-analysis of metal versus plastic stents for preoperative biliary drainage in resectable periampullary or pancreatic head tumors. S. Crippa et al.**
- European Journal of Surgical Oncology, 2016-09-01, Volume 42, Issue 9, Pages 1278-1285.
- Conclusions:
- Although the present systematic review and meta-analysis demonstrates that metal stents are more effective than plastic stents for PBD in patients with resectable periampullary tumors, randomized controlled trials are needed in order to confirm these data with a higher level of evidence.

Metal or plastic stent

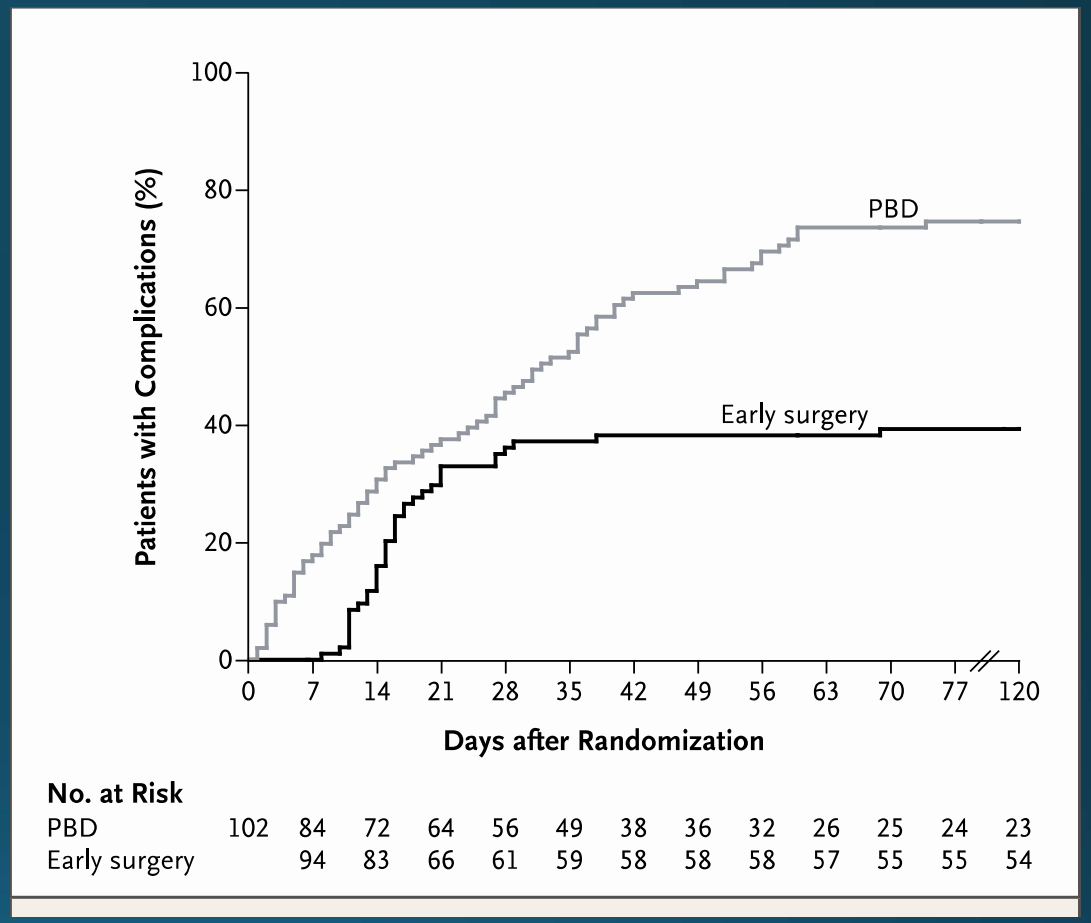
- **Preoperative biliary drainage by plastic or self-expandable metal stents in patients with periampullary tumors: results of a randomized clinical study.** Greger Olsson, et al
- Endosc Int Open. 2017 Sep; 5(9): E798–E808.
- Conclusion:
- This randomized clinical study was unable to demonstrate any superiority of SEMS in the efficacy of preoperative bile drainage, as assessed by the amount of bacteria in the intraoperatively collected bile. However, some data in favor of SEMS were observed among the clinical secondary outcomes variables (preoperative stent exchange rates) without increases in local inflammatory reactions.

Evidence

- Periampullary tumors
- Proximal tumors

Evidence: peri-ampullary tumors

- Van der Gaag, et al, NEJM 2010:
- Routine preoperative biliary drainage in patients undergoing surgery for cancer of the pancreatic head increases the rate of complications.



arly-surgery group, 0.54; 95% confidence interval [CI], 0.41 to 0.71; P<0.001).

Evidence: peri-ampullary tumors

- Fang et al, BJS, 2013
- PBD in patients undergoing surgery for obstructive jaundice is associated with similar mortality but increased serious morbidity compared with no PBD. Therefore, PBD should not be used routinely.

Evidence: peri-ampullary tumors

- Scheufele, et al, Surgery, 2017
- Preoperative biliary drainage does not have a beneficial effect on postoperative outcome. The increase of postoperative overall complications and wound infections urges for precise indications for preoperative biliary drainage and against routine preoperative biliary decompression.

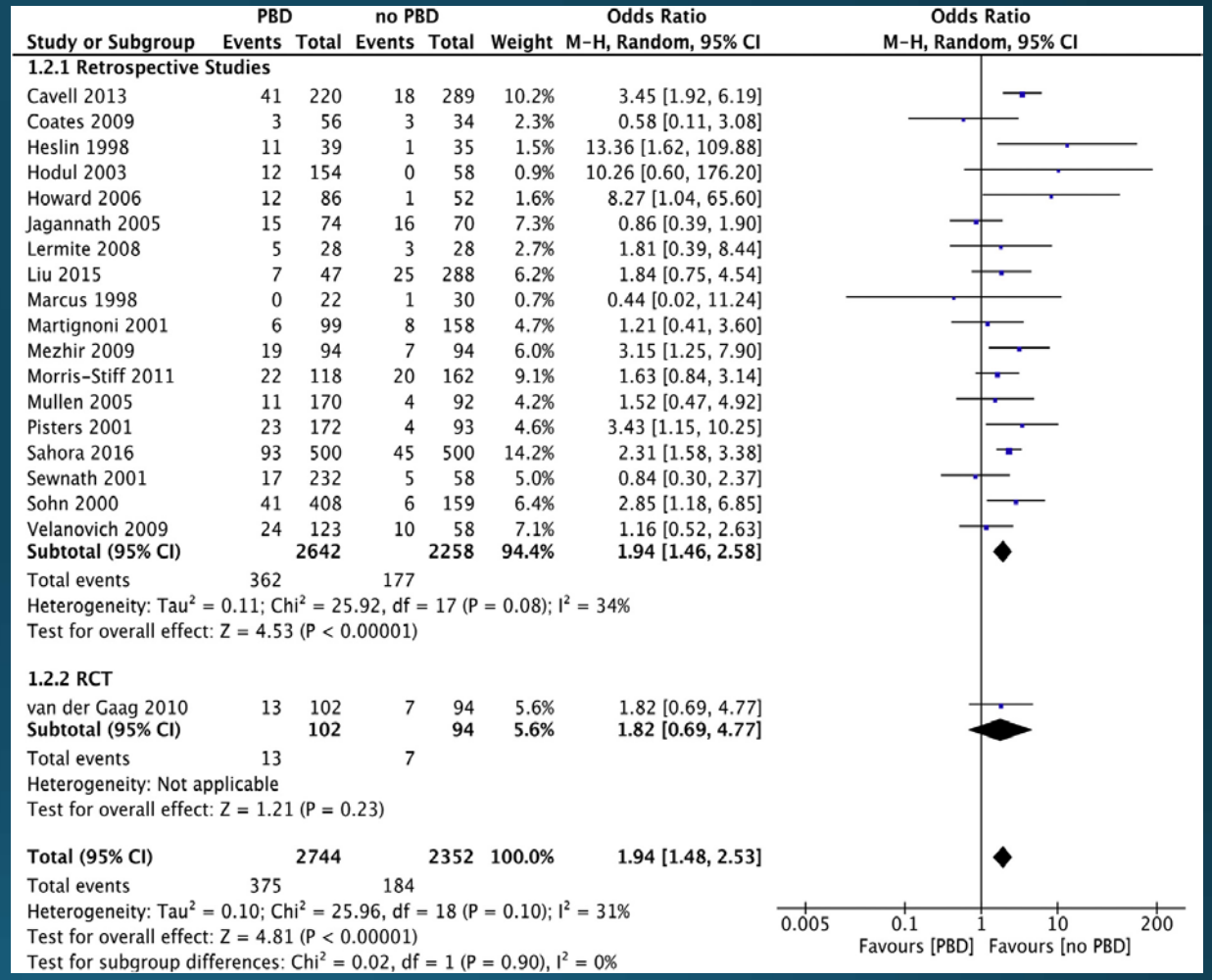


Fig 3. Preoperative biliary drainage increases postoperative wound infections. Subsection 1.2.1 shows the incidence of wound infections in retrospective cohort studies. Subsection 1.2.2 depicts the incidence of wound infection in the randomized controlled trial (RCT). Meta-analysis of retrospective studies revealed an increase in postoperative wound infections (OR 1.94 [95% CI: 1.46–2.58; $P < .00001$]), as did analysis of the RCT (OR 1.82 [95% CI: 0.69–4.77; $P = .23$]). Analyzing all studies, preoperative biliary drainage resulted in a significantly increased incidence of wound infections when compared to nonstented controls (OR 1.94 [95% CI: 1.48–2.53; $P < .00001$]). (Color version of this figure is available online.)

Evidence: proximal lesions

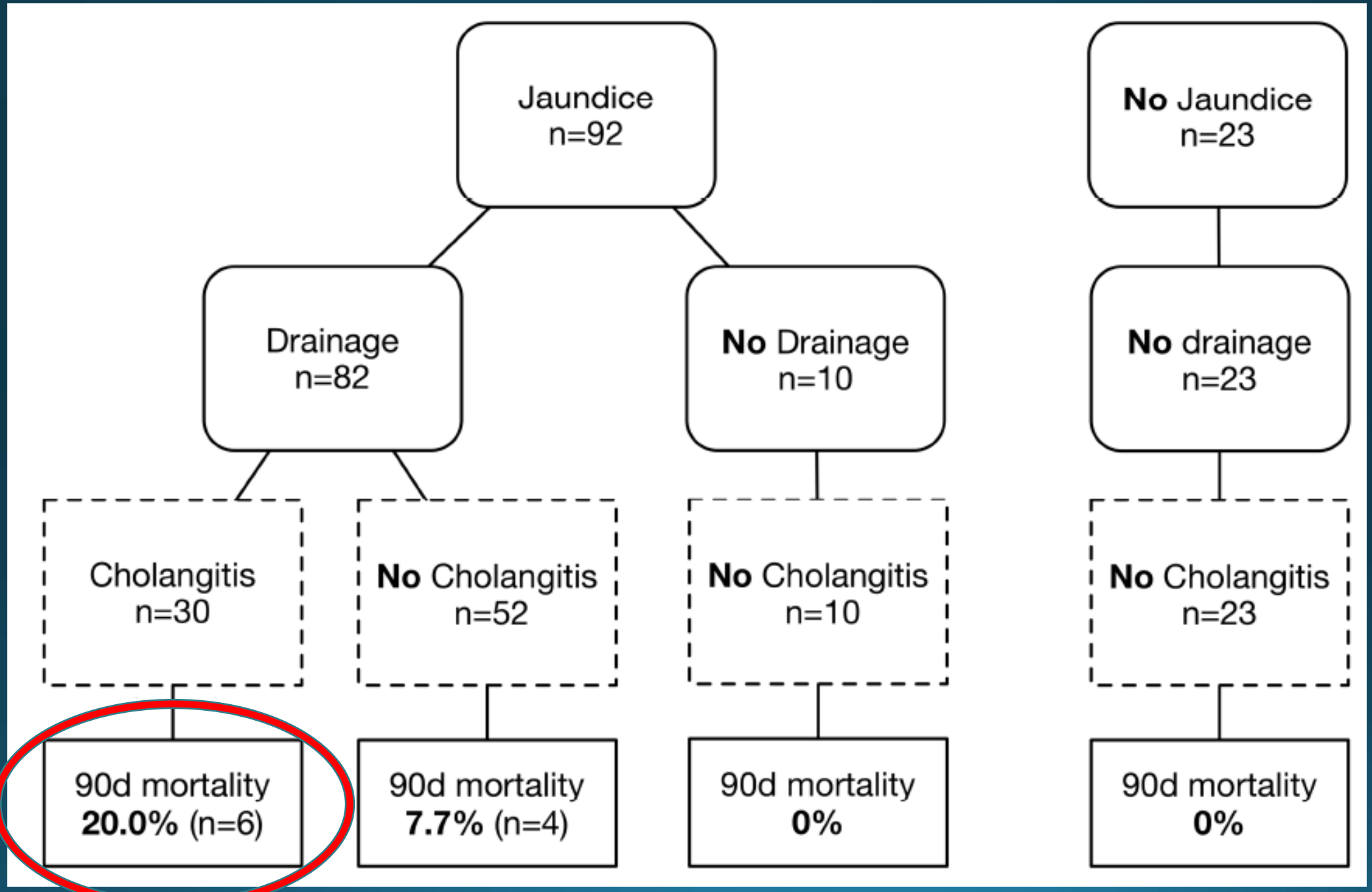
- **Multicentre European study of preoperative biliary drainage for hilar cholangiocarcinoma.** Farges O[1], et al.
- Br J Surg. 2013 Jan;100(2):274-83.
- Conclusion: PBD does not affect overall mortality in jaundiced patients with hilar cholangiocarcinoma, but there may be a difference between patients undergoing right-sided *versus* left-sided hepatectomy.
- **Increased mortality in right vs left hepatectomy and higher mortality rate in patients with bilirubin of > 50 µmol/l.**

Evidence: proximal lesions

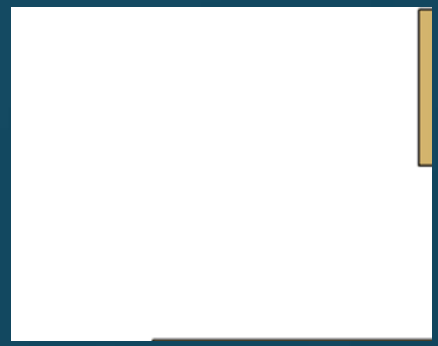
- **Preoperative biliary drainage in patients with hilar cholangiocarcinoma undergoing major hepatectomy.** Xiong JJ[1], et al.
- World J Gastroenterol. 2013 Dec 14;19(46):8731-9.
- Conclusions: Overall postoperative morbidity and mortality rates after major liver resection are not improved by PBD in HCCA patients with jaundice. Preoperative TBIL > 170 μmol/L, Bismuth-Corlette classification and extended liver resection are independent risk factors linked to postoperative complications.

Evidence: proximal lesions

- **Postoperative Mortality after Liver Resection for Perihilar Cholangiocarcinoma: Development of a Risk Score and Importance of Biliary Drainage of the Future Liver Remnant.** Wiggers JK[1], et al.
- J Am Coll Surg. 2016 Aug;223(2):321-331.e1.
- Conclusions: The mortality risk score for patients with resectable PHC can be used for patient counseling and identification of modifiable risk factors, which include FLR volume, FLR drainage status, and preoperative cholangitis. We found no evidence to support preoperative biliary drainage in patients with an FLR volume >50%.


Jaundice
n=92
No Jaundice
n=23
Drainage
n=82
No Drainage
n=10
No drainage
n=23
Cholangitis
n=30
No Cholangitis
n=52
No Cholangitis
n=10
No Cholangitis
n=23
90d mortality
20.0% (n=6)
90d mortality
7.7% (n=4)
90d mortality
0%
90d mortality
0%

Guidelines



- American society of gastroenterologists:
- No role for routine pre-operative biliary drainage in peri-ampullary cancers.

Guidelines

- European society of gastroenterologist:
- We recommend preoperative drainage of potentially resectable malignant CBD obstruction only in patients who are candidates for neoadjuvant therapies, in patients with acute cholangitis, or in patients with intense pruritus and delayed surgery (Recommenda- tion grade A).
- The choice between endoscopic or percutaneous drainage for MHS should be based on local expertise (Recommendation grade D); en- doscopic drainage should be performed in high volume centers with experienced endoscopists and multidisciplinary teams (Recom- mendation grade C).

Survey study on the practice patterns in the endoscopic management of malignant distal biliary obstruction

- Conclusion: There is significant variability in practice patterns for the treatment of MDBO. In spite of the recent ASGE guideline recommendations, some patients with re- sectable MDBO still undergo preoperative ERCP. Current clinical practices are not clearly supported by available data and underscore the need to increase adherence to gastrointestinal societal recommendations and an evidence-based approach to standardized patient care.

In summary

- No place for routine biliary drainage in malignant distal biliary obstruction.
- No clear evidence yet about biliary drainage in malignant hilar obstruction, but available evidence seems to indicate no benefit if the FLR is greater than 50% and the bilirubin less than 50.