



Invited Review Article

Stent placement as a bridge to surgery in malignant biliary obstruction (pancreatic cancer, distal bile duct cancer, and hilar tumors)



Mario Rodarte-Shade, Michel Kahaleh*

A B S T R A C T

Preoperative biliary drainage (PBD) has been a matter of controversy for years. It was initially aimed to improve the clinical status of patients with malignant obstructive jaundice prior to surgery. However, its efficacy and safety have not been proven by randomized controlled trials. Most drawbacks of PBD are related to the increase in procedure-related adverse events and inappropriate biliary decompression. Current trends in PBD show that using self-expanding metallic stents (SEMSs) may reduce the high incidence of stent-related complications with improved outcomes. The aim of this study was to review the current literature regarding PBD in patients with resectable distal pancreaticobiliary and hilar tumors.

Copyright © 2015, Society of Gastrointestinal Intervention. Published by Elsevier. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Keywords: distal bile duct cancer, hilar tumor, malignant biliary obstruction, pancreatic cancer, preoperative biliary drainage

Introduction

Malignant biliary obstruction encompasses a group of neoplasms that compromise bile duct flow and clinically presents with obstructive jaundice. Obstruction can be anatomically classified as “distal” or “proximal.” Proximal bile duct obstruction refers to hilar bile duct cholangiocarcinomas (i.e., Klatskin tumors), whereas distal bile duct obstruction refers to periampullary tumors. Periampullary tumors are defined as neoplasms arising from the head of the pancreas, the distal bile duct, the ampulla of Vater, or the second portion of the duodenum. Because of the broad range of tumors, pancreatic cancer by far remains the most common malignancy in Western countries. During 2014 in the United States, 46,420 patients were expected to be diagnosed with pancreatic cancer. It is also the fourth most common cause of cancer-related death among men (after lung cancer, prostate cancer, and colorectal cancer) and among women (after lung cancer, breast cancer, and colorectal cancer).¹ At the time of diagnosis, approximately only 20% of patients can receive curative surgery.^{2,3} Hence, most patients will require palliative decompression.

Preoperative biliary drainage (PBD) is an old concept that was first described in 1935 by Allen O. Whipple.⁴ Preoperative biliary drainage emerged as a treatment to counteract the deleterious effects of biliary obstruction. Literature suggests that performing surgical resection (i.e., pancreatoduodenectomy) in the setting of hyperbilirubinemia is associated with higher perioperative mortality.^{5,6} However, conflicting data has been published regarding the efficacy and safety of routine PBD. The aim of this article was to

review the existing literature concerning the use of PBD in patients with resectable distal pancreaticobiliary malignancies. Preoperative biliary drainage in hilar tumor is also discussed separately.

Pathophysiology of biliary obstruction

Biliary obstruction and cholestasis has several deleterious effects on patient homeostasis. Most evidence comes from experimental studies in animals that received bile duct ligation. Gut functions are severely impaired in different ways. Jaundiced rats indicate that intestinal barrier function is compromised.⁷ Such impairment has been related to a decreased number and function of gut mucosal T lymphocytes,^{8,9} decreased Kupffer cell function,¹⁰ increased intestinal permeability,¹¹ impaired cell-mediated immunity,¹² impaired reticuloendothelial function,¹³ and altered mucosal immunity.¹⁴ In addition, these gut barrier dysfunctions have been associated with significant bacterial translocation that may be related to endotoxemia that adversely affects patients with biliary obstruction.^{11,15} Other experimental studies in animals and clinical observations in jaundiced patients have demonstrated a high concentration of tumor necrosis factor (TNF) and interleukin-6, which may also contribute to the high morbidity rate of jaundiced patients.^{11,16} In addition to these experimental observations, obstructive jaundice has been associated with deleterious effects on the cardiovascular system and on renal function.^{17–19} Other detrimental consequences of cholestasis include direct hepatic injury with altered hepatic protein synthesis^{20,21} that, in conjunction with deficient vitamin K absorption, produce coagulation

Division of Gastroenterology and Hepatology, Weill Cornell Medical College, New York, NY, USA

Received 13 November 2014; Revised 5 February 2015; Accepted 7 February 2015

* Corresponding author. Division of Gastroenterology and Hepatology, Weill Cornell Medical College, 1305 York Avenue, 4th Floor, New York, NY 10021, USA.

E-mail address: mkahaleh@gmail.com (M. Kahaleh).

Table 1 The Adverse Effects of Biliary Obstruction

Impaired intestinal barrier function
Decreased number and function of gut mucosal T lymphocytes
Decreased Kupffer cell function
Increased intestinal permeability
Impaired cell-mediated immunity
Impaired reticuloendothelial function
Altered mucosal immunity
Bacterial translocation
Endotoxemia (high TNF and IL-6 levels)
Cardiovascular dysfunction
Renal dysfunction
Direct hepatic injury
Coagulation abnormalities

IL-6, interleukin-6; TNF, tumor necrosis factor.

abnormalities.²² Animal models have demonstrated most benefits of PBD; however, the clinical benefits of PBD have not been clearly established. [Table 1](#) lists the adverse effects of biliary obstruction, based on animal models and clinical observations.

Preoperative biliary drainage versus early surgery

Routine PBD in patients with pancreaticobiliary malignancies has been a matter of controversy for years. Early studies primarily included patients who underwent percutaneous biliary drainage. These studies were mostly represented by retrospective and small case series with methodological flaws and contradictory results. Percutaneous transhepatic biliary decompression was initially described as a safe and potentially helpful procedure that allowed normalization of hepatic function and theoretically resulted in a lower operative morbidity in treated patients than in jaundiced patients.²³ Some studies also report that PBD is associated with reduced mortality, less morbidity, and shorter hospital stays.^{24–27} By contrast, further early trials showed that routine PBD by percutaneous methods did not offer any advantage in comparison to surgery without drainage.²⁸ Furthermore, some publications report that patients who undergo preoperative percutaneous transhepatic biliary drainage have an increased rate of complications resulting from the procedure and do not benefit from preoperative drainage.²⁹ The preoperative percutaneous biliary drainage was also associated with increased hospital cost related to the procedure and without any clear benefit in operative risk.³⁰

More recent publications include a greater number of patients who underwent internal drainage by endoscopic retrograde cholangiopancreatography (ERCP), and report that patients who underwent PBD did not have any difference in outcomes in comparison to patients who went directly to surgery.^{31–33} A retrospective analysis of 257 patients who underwent pancreatoduodenectomy showed that a subgroup of 99 patients who had PBD did not have any difference in morbidity, infectious complications, reoperation rate, mortality, or long-term survival.³¹ Another retrospective cohort reported the outcomes of 311 patients who were submitted to pancreatoduodenectomy.³² Of these, 232 patients received preoperative internal biliary drainage. They were compared to the patients who underwent immediate surgery ($n = 58$). The authors found that PBD did not influence the incidence of postoperative complications. A retrospective review of 184 patients of 241 consecutive patients who underwent surgery showed no significant incidence of postoperative complications between patients who had preoperative drainage and patients who did not.³³

Several studies have not associated PBD with an increased rate of complications; however, there are other authors with contradictory results that claim an increased risk of adverse events—primarily, infectious complications. Most results come from retrospective

reviews of prospectively collected consecutive series at major pancreaticobiliary centers.^{34–39} Research has found that PBD increases the risk of positive intraoperative bile cultures, which also has been associated with postoperative infectious complications and a similar microorganism profile.³⁴ Experience with 240 consecutive cases of pancreatoduodenectomy performed at the Memorial Sloan Kettering Cancer Center (New York, NY, USA) revealed that PBD (performed in 175 patients) was associated with a high rate of complications, infectious complications, intra-abdominal abscess, and postoperative death.³⁵ A subsequent study from the same group, which involved 340 consecutive patients who underwent pancreatoduodenectomy, showed that PBD was associated with a stent-related complication rate of 23% and a two-fold increase in postpancreatotomy infectious complications.³⁶ A retrospective analysis of 567 patients who underwent pancreatoduodenectomy at the Johns Hopkins University School of Medicine (Baltimore, MD, USA) found that 408 (72%) of patients underwent PBD. The authors of this analysis found that preoperative biliary stenting did not increase the overall complication rate or mortality rate in patients who underwent pancreatoduodenectomy; however, stenting did appear to increase the rate of pancreatic fistula, wound infection, and bile contamination.³⁷ Another research group found that PBD was associated with increased operative time, intraoperative blood loss, and higher incidence of wound infection; however, it did not increase major morbidity and mortality.³⁸ A group at the University of Texas MD Anderson Cancer Center (Houston, TX, USA) evaluated perioperative morbidity and mortality in 300 consecutive patients who underwent pancreatoduodenectomy.³⁹ The group found that PBD (performed in 172 patients) did increase the risk of postoperative wound infection; however, there was no increase in the risk of major postoperative complications or death.

Several recent meta-analyses have been published regarding the controversy of PBD.^{40–45} Major drawbacks of these meta-analyses are the inclusion of retrospective series, methodological flaws, and the inclusion of patients who underwent percutaneous PBD or endoscopic PBD. [Table 2](#) shows the results of the most recent meta-analyses.

DRainage vs OPeration (DROP-trial)

A recent multicenter controlled trial randomized patients with resectable cancer of the pancreatic head to undergo PBD for 4–6 weeks, followed by surgery, or to undergo surgery alone within 1 week after diagnosis.^{46,47} This Dutch study enrolled 202 patients. It was conceived to compare the outcome of both strategies. The primary outcome studied in the trial was the rate of serious complications. The rate of overall serious complications were significantly higher in patients who underwent PBD (74% vs. 39%, $P < 0.001$). However, there was not a significantly increased rate of surgery-related complications (47% vs. 37%, $P = 0.14$). In addition, the mortality and length of stay did not differ between the two groups. Based on these results, the authors concluded that routine PBD in patients undergoing surgery for pancreatic cancer increases the rate of serious complications.

Despite the adequate methodology used in this study, there are some major drawbacks that need to be considered and have been previously noted.⁴⁸ The DROP-trial, which included low-volume ERCP centers, reports a high number of serious complications in the PBD group that were mostly related to the drainage procedure. Endoscopic retrograde cholangiopancreatography is a technically demanding and potentially high-risk procedure that needs to be performed in tertiary centers by experienced therapeutic endoscopists. In the best scenario, there is a consistently expected failure rate of up to 10%.⁴⁹ However, the DROP-trial shows a failure rate of 25% in patients who subsequently required a second drainage

Download English Version:

<https://daneshyari.com/en/article/3310936>

Download Persian Version:

<https://daneshyari.com/article/3310936>

[Daneshyari.com](https://daneshyari.com)