The American Journal of Surgery (2013) 206, 40-46

The American Journal of Surgery®

Clinical Science

The optimal duration of preoperative biliary drainage for periampullary tumors that cause severe obstructive jaundice

Jun Hyuk Son, M.D.[a], Jaihwan Kim, M.D.[b], Sang Hyub Lee, M.D., Ph.D.[a,*], Jin-Hyeok Hwang, M.D., Ph.D.[b], Ji Kon Ryu, M.D., Ph.D.[a], Yong-Tae Kim, M.D., Ph.D.[a], Yong Bum Yoon, M.D., Ph.D.[a], Jin-Young Jang, M.D., Ph.D.[c], Sun-Whe Kim, M.D., Ph.D.[c], Jai Young Cho, M.D., Ph.D.[d], Yoo-Seok Yoon, M.D., Ph.D.[d], Ho-Seong Han, M.D., Ph.D.[d], Sang Myung Woo, M.D., Ph.D.[e], Woo Jin Lee, M.D., Ph.D.[e], Sang Jae Park, M.D., Ph.D.[e]

[a]Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, Seoul, Korea; [b]Department of Internal Medicine, Seoul National University Bundang Hospital, Seongnam, Korea; [c]Department of Surgery, Seoul National University College of Medicine, Seoul, Korea; [d]Department of Surgery, Seoul National University Bundang Hospital, Seongnam, Korea; [e]Center for Liver Cancer, National Cancer Center, Goyang, Korea

KEYWORDS:
Pancreas;
Common bile duct;
Ampulla of Vater;
Jaundice;
Obstructive;
Drainage

Abstract

BACKGROUND: Despite routine preoperative biliary drainage (PBD) with periampullary cancer, its optimal duration has not been established. The objective of this study was to investigate PBD in severely jaundiced patients.

METHODS: A total of 120 patients with periampullary tumors who underwent surgery with intent to cure after PBD for severe obstructive jaundice were enrolled. According to the duration of PBD, 66 and 54 patients were classified into the long-term ($\geq$2 weeks) and short-term ($<$2 weeks) groups.

RESULTS: PBD-related complications occurred in 6 (9.1%) and 14 (25.9%) patients in the short-term and long-term groups, respectively ($P = .014$). Rates of surgery-related complications and mortalities were not significantly different between the 2 groups. The R0 resection rate tended to be lower ($P = .054$) and the mean length of hospital stay was significantly longer ($P = .039$) in the long-term group.

CONCLUSIONS: PBD duration $<$2 weeks is more appropriate in severely jaundiced patients with periampullary cancer.

Periampullary cancers are neoplasms that arise in the vicinity of the ampulla, including ampullary, duodenal, distal bile duct, and pancreatic head cancer. Surgical resection is the only option for cure if there is no evidence of distant metastasis.[1,2]

Obstructive jaundice is the most common symptom in patients with periampullary cancer. Prolonged and

Drs Jun Hyuk Son and Jaihwan Kim contributed equally to this work as first authors.

The authors declare no conflicts of interest.

* Corresponding author. Tel.: +82-2-2072-2228; fax: +82-2-762-9662.
E-mail address: gidoctor@korea.com

Manuscript received May 23, 2012; revised manuscript July 13, 2012

0002-9610/$ - see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2012.07.047

progressive obstructive jaundice is associated with a proinflammatory state, resulting from portal and systemic endotoxemia and bacterial translocation.[3–7] This proinflammatory state causes an uncontrolled induction of the inflammatory cascade, contributing to the development of complications.[8,9] Obstructive jaundice is also associated with impaired cellular immunity.[3,10,11] The degree of jaundice correlates with disturbances in coagulation, decreased hepatic function, and the development of cholangitis.[12] Moreover, cholestasis has deleterious effects on the cardiovascular system and blood volume, leading to renal dysfunction.[7,13,14]

Because surgery in patients with jaundice carries an increased risk for postoperative complications, preoperative biliary drainage (PBD) has been introduced as a routine procedure.[15,16] However the efficacy of PBD is controversial. In several previous experimental and retrospective studies, PBD reduced morbidity and mortality after surgery.[17,18] On the contrary, several meta-analyses of randomized trials showed that routine PBD carried no benefit in reducing morbidity and mortality.[19–21] In addition, a recent multicenter, prospective randomized trial comparing PBD followed by surgery versus early surgery in patients with obstructive jaundice (serum total bilirubin level, 2.3 to 14.6 mg/dL) due to pancreatic head cancer revealed that routine PBD increased the complication rate.[22] Thereafter, PBD has not been accepted as the routine management in periampullary tumors, including pancreatic head cancer.

Patients with severe obstructive jaundice (serum total bilirubin >15 mg/dL [>258 μmol/L]) due to periampullary cancers usually undergo PBD in clinical practice, because previous studies have shown that severe jaundice is a risk factor for postoperative complications.[23,24] Concerning the duration of PBD, it has been suggested that adequate recovery of hepatic function depends on the duration of biliary decompression and the duration of obstructive jaundice before decompression.[23,25,26] A minimum of 4 to 6 weeks of PBD was advised, with even longer periods proposed for patients with prolonged biliary obstruction before decompression. A more recent study showed that preoperative decompression is necessary for ≥3 weeks before coagulation and hepatic and reticuloendothelial system function start improving.[27] However, increased drainage duration has been known to increase the risk for drainage-related complications,[20,22] and the optimal duration of PBD has not been established.

To investigate the optimal duration of PBD in severely jaundiced patients with periampullary cancers, we evaluated clinical outcomes according to the duration of PBD in this study.

Methods

Patients

A prospectively maintained database was queried for patients who were diagnosed with severe obstructive jaundice (serum total bilirubin >15 mg/dL [>258 μmol/L]) due to periampullary tumor and who underwent surgery with intent to cure with PBD between October 2003 and May 2011 at Seoul National University Hospital, Seoul National University Bundang Hospital, and the National Cancer Center in Korea. Patients who had evidence of distant metastasis or local vascular involvement on computed tomography were not included. Patients who had definite evidence of cirrhosis or other hepatic disease causing hepatic dysfunction or who had histories of alcohol abuse were also excluded. Therefore, a total of 120 patients were analyzed in this study.

This study protocol was approved by each institutional review board of the Human Clinical Research Center.

Patients were divided into 2 separate groups according to the duration of PBD. Patients who underwent PBD for ≥2 weeks were classified as the long-term drainage group, and those who underwent PBD for <2 weeks constituted the short-term drainage group. Biliary drainage was done by endoscopic retrograde cholangiopancreatography or percutaneous transhepatic cholangiography. The standard surgical procedure for resectable tumors was pancreaticoduodenectomy or pylorus-preserving pancreaticoduodenectomy. If resection was deferred because of metastasis or local spread, palliative bypass surgery, which was mostly hepaticojejunostomy with or without gastroenterostomy, was done. All clinical, operative, pathologic, and follow-up data were obtained by retrospective chart review. The following patient characteristics were assessed: age; sex; body mass index; weight loss; duration of symptoms; selected laboratory values, including initial serum total and direct bilirubin and preoperative serum total bilirubin; initial serum creatinine; type of PBD method; type of tumor; and type of operation.

The rates of PBD procedure-related complications, surgery-related complications, and mortality up to 90 days after PBD were evaluated as the primary outcomes. R0 resection rate and hospital stay (from the day of the biliary drainage procedure to discharge) were evaluated as the secondary outcomes.

Definition of events

Drainage procedure–related serious complications included cholangitis, bleeding, acute pancreatitis, acute cholecystitis, bowel perforation, and stent occlusion. Surgery-related serious complications included anastomotic leakage, delayed gastric emptying, intra-abdominal abscess, wound infection, cholangitis, bleeding, and portal vein thrombosis. Other general complications, such as pneumonia and any complications requiring laparotomy, were also evaluated. In-hospital mortality and the length of hospital stay were assessed. The definitions of complications have been used in previous studies that evaluated the management of complications on the basis of generally accepted criteria.[18,23–30] Details on the definitions of complications are listed in Table 1. Immediate procedure-related complications were defined as complications such as