

Effect of Preoperative Endoscopic Decompression on Malignant Biliary Obstruction and Postoperative Infection

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ABSTRACT

Background/Aims: The role of preoperative biliary drainage as an adjunct in patients undergoing surgical resection for malignant biliary obstruction is controversial. The objective of the present study was to evaluate the effects of preoperative endoscopic biliary drainage and its possible association with postoperative infection in patients presenting neoplastic obstructive jaundice.

Methodology: The medical records of 53 patients presenting periampullary neoplasia were reviewed. In all of these patients, bile was obtained intraoperatively by puncture. Among the 53 patients, 14 had been submitted to preoperative endoscopic drainage (Group I) and 39 had undergone surgery without decompression (Group II). For statistical analysis, the level of significance was set at 5%.

Results: Bile culture was positive in 13 (92.8%) of

the patients in Group I, a significantly higher incidence than that observed in group II, in which 16 (41%) of the patients presented positive cultures ($p=0.001$). There was no significant difference in general postoperative morbidity between groups (64.2% for group I *vs.* 46% for group II) or mortality (0% *vs.* 7.6%, respectively). When infective complications (cholangitis, pneumonia, wall infection) were analyzed separately, a higher incidence, although without significance, was found in Group I than in Group II (50% *vs.* 28.2%, respectively; $p=0.1913$).

Conclusions: The presence of an endoscopic biliary drain provokes bacterial colonization, possibly due to the combination of residual cholestasis and duodenal reflux to the bile duct, raising concerns about the possible appearance of infective complications during the postoperative period.

KEY WORDS:

Biliary obstruction;
Biliary drainage;
Duodenal-pancreatic resection;
Periampullary tumor;
Endoscopic decompression;
Surgery, Infection,
Morbidity;
Mortality

INTRODUCTION

The role of preoperative biliary drainage as an adjunct in patients undergoing surgical resection for malignant biliary obstruction is controversial. It has been reported that the mortality rate due to surgical treatment of malignant obstructive jaundice ranges from 5% to 27% and that the morbidity rate is approximately 50% (1,2). Preoperative biliary drainage has been considered in order to reduce morbidity and mortality rates. However, for various reasons, this topic is still under discussion (2). Experimental and clinical studies have shown that external biliary drainage does not improve the outcome of subsequent operations (3,4). There is strong evidence, however, that internal biliary drainage probably does have a beneficial effect because it restores the nutritional state and immune function, while reducing endotoxemia (5-8). In a clinical practice study, preoperative endoscopic decompression did not reduce the postoperative mortality and morbidity (9). In addition, it has been shown that the systemic inflammatory response continues to be intense after internal biliary drainage, a fact that may be attributable to bacterial colonization (10). Results

of recent retrospective studies have suggested that the placement of biliary drains and subsequent bacterial colonization of the biliary tree may increase the rates of morbidity and mortality (11). In the present study, we evaluated the effect of internal biliary drainage on the microbiology of the bile and on postoperative infections in patients with malignant bile obstruction.

METHODOLOGY

The medical records of 53 patients with malignant obstructive jaundice who underwent surgery between February 1995 and November 2000 were reviewed retrospectively. Fourteen of these patients had been submitted to preoperative endoscopic biliary decompression (Group I), whereas 39 had not (Group II). Endoscopic biliary decompression was performed in 9 patients with a 10-French biliary stent, in 2 patients with an 11.5-French stent, in 2 patients by papillotomy and in 1 patient by infundibulotomy. The effect of decompression was evaluated both clinically and by determination of bilirubin and alkaline phosphatase concentrations.

During surgery, prior to manipulation of other

structures, the common bile duct was punctured and bile was collected for microbiological analysis (thioglycolate medium + complement) in order to test for the presence of aerobic and anaerobic organisms.

Morbidity and mortality during hospitalization were evaluated. Data concerning biochemical measurements were analyzed statistically by the nonparametric Wilcoxon test and all other data were analyzed by Fisher's exact test, with the level of significance set at $p < 0.05$.

RESULTS

The mean age of the patients in Group I ($n=14$; 6 men and 8 women) was 69.6 years (range, 47 to 86 years), whereas the mean age of those in Group II ($n=39$; 21 men and 18 women) was 60.1 years (range, 27 to 80 years). At admission, Groups I and II did not differ significantly in mean levels of total bilirubin (13.3mg/mL and 16.8mg/mL, respectively), alkaline phosphatase (697 U/L and 690 U/L) or albumin

(3.61mg/mL and 3.33mg/mL). In Group I, mean total bilirubin and alkaline phosphatase values were significantly lower after endoscopic decompression (4.49 ± 13.3 mg/mL, $p=0.01$; and 361 ± 697 U/L, $p=0.02$, respectively).

Endoscopic treatment resulted in complications in 2 patients: acute cholecystitis in 1 and cholangitis in the other.

Group I was submitted to six duodenopancreatic resections for curative purposes and to eight palliative surgeries. A significantly lower percentage of resections was performed in Group II ($n=6$ patients; $p=0.04$) (**Table 1**).

Bile culture was positive in 13 (92.8%) of the patients in Group I, a significantly higher incidence than that observed in group II, in which 16 (41%) of the patients presented positive cultures ($p=0.001$). **Table 2** shows the microorganisms identified, as well as the frequency at which each occurred in the bile cultures of patients in both groups.

There was no significant difference between groups in general postoperative morbidity (64.2% for group I vs. 46% for group II) or mortality (0% vs. 7.6%, respectively). When infective complications (cholangitis, pneumonia, wall infection) were analyzed separately, a higher, although nonsignificant, incidence was found in Group I than in Group II (50% vs. 28.2%, respectively; $p=0.1913$) (**Table 3**).

DISCUSSION

Despite the controversy involving the indication for preoperative endoscopic biliary decompression in patients with malignant obstructive jaundice, we, along with other authors, have believed for some time that biliary drainage improves the outcome of subsequent operations (3,4). In the present evaluation, endoscopic decompression was indicated for patients whose staging exams showed a more restricted form of disease. In such patients, curative resection was indicated, since the objective was to operate on patients without cholestasis and improve the outcome of major surgeries. When the preoperative evaluation revealed locally advanced disease in a patient at high surgical risk, palliative surgery was performed without preoperative biliary decompression.

Our findings demonstrate that preoperative endoscopic biliary drainage was responsible for a higher frequency of bacterial contamination, as well as contamination of the bile duct by a variety of other germs, including aerobic and anaerobic microorganisms.

In all patients submitted to preoperative biliary decompression, dissection of the hepatic pedicle was found to be more laborious. This was due to peribiliary participation in the inflammatory process, as previously reported (12). In some cases, after the bile duct had been opened, food residues were observed, together with biliary sludge and a putrid odor, indicating persistent cholestasis, duodenal bile reflux and the presence of anaerobes.

The implications of infected bile in biliary tract surgery are not clear. Could the presence of bacteria in

TABLE 1 Patient Characteristics

	Group I (n=14)	Group II (n= 39)	p
Age (years)	69.6 (47-86)	60.1 (27-80)	NS
Total bilirubin (mg/mL)	13.3	16.8	NS
Alkaline phosphatase (U/L)	697	690	NS
Albumin (mg/mL)	3.61	3.33	NS
Whipple's procedure	6 (42.8%)	7 (17.9%)	0.04

NS: Nonsignificant.

TABLE 2 Frequency of Bacteria Detected in Bile Culture

	Group I (n=14)	Group II (n=39)
<i>E. coli</i>	10	10
<i>Serratia marsensis</i>	3	0
<i>Klebsiella pneumoniae</i>	4	6
<i>Enterobacter aerogenes</i>	1	0
<i>Streptococcus D group</i>	3	0
<i>Aeromonas sp</i>	1	0
<i>Clostridium perfringens</i>	1	0
<i>Acinetobacter anitratus</i>	1	0
<i>Bacteroides Fragilis</i>	2	0
<i>Enterobacter cloacae</i>	1	1
<i>Klebsiella oxytoca</i>	1	0
<i>Citrobacter diversus</i>	2	0
<i>Proteus vulgaris</i>	1	0
<i>Staphylococcus aureus</i>	1	3
<i>Pseudomonas aeruginosa</i>	1	0
<i>Staphylococcus conni</i>	1	1

TABLE 3 Evaluation of Morbidity and Mortality

	Group I (n=14)	Group II (n= 39)	p
Bile contamination	13 (92.8%)	16 (41%)	0.001
Postoperative infection	7 (50%)	11 (28%)	NS
Morbidity	9 (64.2%)	18 (46%)	NS
Mortality	0	3 (7.6%)	NS

NS: Nonsignificant.

the bile be associated with postoperative infections? This question remains unanswered (13). However, there is evidence that the incidence of infective complications was not significantly higher in patients whose bile was infected than in those whose bile was sterile (2).

In this study, general postoperative morbidity and mortality were similar for the two groups, and the rate of infective complications (cholangitis, pneumonia and wall infection) was more frequent in Group I, although the difference was not statistically significant. This supports the idea that preoperative endoscopic biliary decompression, in addition to being responsible for colonization of the bile by pathogenic microorganisms, does not confer the benefits expect-

ed.

In another study, preoperative biliary decompression increased the risk of postoperative wound infection after duodenopancreatic resection, but there was no increased risk for major postoperative complications or for death associated with preoperative stent placement (14).

At present, we recommend endoscopic biliary exam and biliary decompression only for patients at high surgical risk who present malignant obstructive jaundice without duodenal occlusion with periampullary tumor and severe cholangitis. In our opinion, biliary drainage should be avoided whenever possible in patients who present periampullary tumor and are candidates for surgical resection.

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