Review Article

A Meta-Analysis of Randomized Trials: Immediate Stent Placement vs. Surgical Bypass in the Palliative Management of Malignant Biliary Obstruction

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Abstract

Context. Many patients with unresectable pancreatic and peripancreatic cancer require treatment for malignant biliary obstruction.

Objectives. To conduct a meta-analysis of the English language literature (1985−2011) comparing immediate biliary stent placement and immediate surgical biliary bypass in patients with unresectable pancreatic and peripancreatic cancer and analyze associated hospital utilization patterns.

Methods. After identifying five randomized controlled trials comparing immediate biliary stent placement and immediate surgical biliary bypass, we performed a meta-analysis for dichotomous outcomes, using a random effects model. We compared resource utilization in terms of the number of hospital days before death by reviewing high-quality literature.

Results. Three hundred seventy-nine patients were identified. We found no statistically significant differences in success rates between the two treatments (risk ratio [RR] 0.99; 95% CI 0.93−1.05; $P = 0.67$). Major complications and mortality were not significantly higher after surgical bypass (RR 1.54; 95% CI 0.87−2.71; $P = 0.14$). Recurrent biliary obstruction was significantly less frequent after surgical bypass than after stent placement (RR 0.14; 95% CI 0.03−0.63; $P < 0.01$). Despite similar overall survival rates, longer survival was associated with more hospital days before death in stent patients than in surgical patients.

Conclusion. Nearly all patients with unresectable pancreatic cancer benefit from some procedure to manage biliary obstruction. Patients with low surgical risk benefit more from surgery because the risk of recurrence and subsequent

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hospital utilization are lower than after stent placement. J Pain Symptom Manage 2014;47:307−314. *Published by Elsevier Inc. on behalf of U.S. Cancer Pain Relief Committee.*

Key Words
Pancreatic cancer, biliary bypass, biliary stent

Introduction

Despite the advent of multidisciplinary cancer therapy, pancreatic adenocarcinoma and peripancreatic cancer are still among the most morbid and lethal cancers in the U.S. The only potential for cure remains resection, but even after a presumably curative resection, the median survival time is only 25−34 months.[1−3] The five year survival rate of patients whose cancer is deemed unresectable for cure (per radiologic imaging or intraoperative findings) is less than 5%.[2,4]

Biliary obstruction is a major potential consequence of pancreatic and peripancreatic cancer. At the time of diagnosis, more than 70% of patients have biliary obstruction and require intervention.[5,6] Since the late 1970s, endoscopic management of biliary obstruction has been increasingly used, with correspondingly less use of open abdominal surgical procedures.[7,8] Recent literature has suggested, however, that biliary stent placement, followed by a planned surgical biliary bypass for curative resection after metabolic correction, may be associated with worse outcomes than early or immediate surgical biliary bypass.[9] Up to 50% of patients with unresectable pancreatic cancer eventually require an intervention for gastric outlet obstruction as well.[5,10]

Surgical management of biliary obstruction typically consists of a bypass from the common bile duct or gallbladder to the duodenum or jejunum.[6,11] Endoscopic or percutaneous stent procedures typically include placement of a covered or uncovered metal or plastic stent from the proximal or mid-common bile duct into the duodenum.

For our meta-analysis, we examined published randomized trials to determine the ideal treatment for biliary obstruction in patients with unresectable pancreatic or peripancreatic cancer. Specifically, we performed a meta-analysis of randomized controlled trials comparing stent placement and surgical bypass in the palliative management of malignant biliary obstruction resulting from pancreatic or peripancreatic cancer. We also performed a meta-analysis of inpatient utilization rates to estimate whether the two treatments differ in costliness.

Methods

Search Strategy

We searched PubMed, Cumulative Index to Nursing and Allied Health Literature, and Web of Science for articles, using combinations of these relevant key words: biliary bypass, biliary stent, biliary obstruction, and pancreatic/peripancreatic cancer. Limits placed on the search included English language, randomized controlled trials, and human studies. In addition, we sought referenced studies that were not listed in those three major databases. Publication dates for inclusion were 1985 through 2011. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses protocol, which evolved from the Quality of Reporting of Meta-analyses protocol for systemic reviews and meta-analyses.[12]

Article Selection

Initially, we found 24 publications (Fig. 1). We excluded studies with nonrandomized study designs, review articles, articles containing an unspecified number of patients with pancreatic or peripancreatic cancer, and articles comparing only different types of stents or only different types of surgical operations.

Major Outcomes

The major outcomes that we investigated were technical success of the procedures, major complications of the procedures, mortality, and recurrent biliary obstruction. Each of the studies that we included defined technical success and major complications. Major