Endoscopic or Percutaneous Biliary Drainage for Klatskin Tumors?

Thomas Walter, MD, PhD, Chia S. Ho, MD, Anne M. Horgan, MD, Andrew Warkentin, BHSc, Steve Gallinger, MD, PhD, Paul D. Greig, MD, PhD, Paul Kortan, MD, and Jennifer J. Knox, MD, PhD

ABSTRACT

Purpose: Controversy exists regarding the preferred biliary drainage technique in patients with Klatskin tumors because few comparative studies exist. This study compared outcomes of endoscopic biliary drainage (EBD) and percutaneous transhepatic biliary drainage (PTBD).

Materials and Methods: Consecutive patients (N = 129) with Klatskin tumors treated with initial EBD or PTBD were identified, and their clinical histories were retrospectively reviewed. The primary endpoint was the time to therapeutic success (TTS), defined as the time between the first drainage and a total bilirubin measurement of 40 μmol/L or lower.

Results: EBD was the first biliary decompression procedure performed in 87 patients; PTBD was performed first in 42. Technical success rates (78% with EBD vs 98% with PTBD; $P = .004$) and therapeutic success rates (49% vs 79%, respectively; $P = .002$) were significantly lower in the EBD group than in the PTBD group. Forty-four patients in the EBD group (51%) subsequently underwent PTBD before therapeutic success was achieved or antitumoral treatment was started. Median TTSs were 61 days in the EBD group and 44 days in the PTBD group, and multivariate analysis showed a hazard ratio of 0.63 (95% confidence interval, 0.41–0.99; $P = .045$). In patients treated with surgery or chemotherapy with or without radiation therapy, median times to treatment were 76 and 68 days in the EBD and PTBD groups, respectively ($P = .76$). Cholangitis occurred in 25% and 21% of patients in the EBD and PTBD groups, respectively ($P = .34$).

Conclusions: PTBD should be seriously considered for biliary decompression when treating patients with Klatskin tumor.

ABBREVIATIONS

CI = confidence interval, EBD = endoscopic biliary drainage, HR = hazard ratio, PTBD = percutaneous transhepatic biliary drainage, TTS = time to therapeutic success

Perihilar cholangiocarcinoma, also called Klatskin tumor, can be defined as a tumor located above the junction of the cystic duct up to and including the second-order biliary branches of the right and left bile ducts. These cancers have a poor prognosis, with 5-year survival rates in the range of 5%–15% (1). Surgical resection, when possible, remains the only curative treatment option; perhaps liver transplantation can be performed in highly selected cases (2). Approximately 80% of patients with Klatskin tumors are diagnosed with their disease at an unresectable/metastatic stage, and treatment with chemotherapy (3) or chemoradiation therapy is therefore palliative. Moreover, almost all these patients present with obstructive jaundice, the optimal management of which has important implications. First, effective biliary drainage provides symptomatic relief from pruritus, cholangitis, pain, and jaundice. Second, optimal biliary decompression allows administration of chemotherapy/chemoradiation therapy safely as early as possible and avoids potentially life-threatening sepsis.

Endoscopic biliary drainage (EBD) has been recognized as the treatment of choice in Europe and North America for bile duct obstruction in cholangiocarcinoma, perhaps in

From the Division of Medical Oncology (T.W., A.M.H., J.J.K.), University of Toronto, Princess Margaret Hospital; Department of Surgery (S.G.), University of Toronto, Mount Sinai Hospital; Department of Medical Imaging (C.S.H., A.W.) and Division of General Surgery (P.D.G.), University of Toronto, Toronto General Hospital; Center for Therapeutic Endoscopy and Endoscopic Oncology (P.K.), St. Michael's Hospital, Toronto, Ontario, Canada; and Department of Gastroenterology (T.W.), Edouard Herriot Hospital, Lyon, France. Received May 21, 2012; final revision received August 22, 2012; accepted September 7, 2012. **Address correspondence to** T.W., Division of Medical Oncology and Hematology, Princess Margaret Hospital, 610 University Ave., Toronto, ON, Canada M5G 2M9; E-mail: thomas.walter@chu-lyon.fr

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part as a result of the study reported by Speer et al in 1987 (4), and because it does not require external access. Percutaneous biliary drainage has comparable results, and experts usually recommend it when endoscopic expertise is not available or has failed, or if there are multiple isolated segments with cholangitis (5). However, some retrospective studies from Europe and Asia (6–8) show that PTBD may be done upfront instead of EBD, with better efficacy and fewer complications.

Therefore, the best biliary drainage intervention for Klatskin tumor remains under debate. Therefore, we did a retrospective analysis comparing the outcomes of EBD and PTBD in patients with Klatskin tumor who were seen in our tertiary center. Our primary endpoint was to compare the time to therapeutic success (TTS)—defined as the time between the first procedure and the first total bilirubin measurement of 40 μmol/L or lower—of the two procedures. This primary endpoint is able to capture the possible superiority of one procedure versus the other in patients receiving an antitumoral treatment and those receiving supportive care. Secondary endpoints assessed the technical and therapeutic success rates, the rate of conversion to the alternative procedure, the time to treatment, the overall survival, and complications of both procedures.

MATERIALS AND METHODS

Patients

Among 820 consecutive patients newly diagnosed with biliary tract cancer and managed at the University Health Network (Toronto, Ontario, Canada) from January 1, 1991, to May 31, 2011, 149 presented with a Klatskin tumor. Among them, 129 patients underwent a biliary drainage before any treatment and were included in the present study. There were no selection criteria for biliary decompression. The referring physicians decided whether endoscopic or percutaneous techniques were to be used. Institutional review board approval was obtained for this retrospective study. Histologic diagnosis and baseline Eastern Cooperative Oncology Group performance status were retrieved for all patients. All tumors were staged with the American Joint Committee on Cancer/Union for International Cancer Control tumor/node/metastasis classification (seventh edition) (9) and with the modified Bismuth–Corlette system (10) based on imaging studies by two of the investigators. The date and the type of first antitumor treatment were recorded.

Biliary Drainage Procedures

EBD and PTBD procedures were performed in different centers over a period of two decades, so technical procedures were not uniform. However, 30% of the first EBD procedures and 70% of the first PTBD procedures were performed in a single local institution. These institutions are referred to as reference centers in the present study, and these procedural techniques have already been published (11,12). In the case of multisegmental obstruction, the decision whether to attempt drainage of the entire liver was at the discretion of the attending endoscopist or interventional radiologist. A self-expandable metal stent (uncovered) was placed upfront by endoscopists or radiologists in very few patients with palliative treatment intent, histologic proof of cholangiocarcinoma, and with a life expectancy more than 3–6 months. The number, type, and location (right, left, or both sides) of material inserted during the first procedure were recorded.

An AccuStick set (Boston Scientific, Natick, Massachusetts) was used for PTBD. Ultrasound guidance was used for the initial ductal puncture, whereas fluoroscopy was used for catheter insertion, manipulation, and advancement. A Glidewire was inserted into the opacified duct and used to guide insertion of the AccuStick set, which consists of a 6-F sheath and plastic dilator. A 4-F Kumpe catheter (Cook, Bloomington, Indiana) was then inserted through the sheath to access the bile duct, and advanced to the duodenum. An internal/external drain (8 or 10 F) was placed with its distal end in the duodenum. Its external portion was then fixed to the skin. After an initial external drainage that lasted 24–72 hours, a low-profile device was usually applied to the catheter at skin level to establish internal drainage (12,13).

For EBD, a therapeutic duodenoscope was routinely used for common bile duct cannulation. Retrograde cholangiography was performed to localize the site of obstruction. After biliary sphincterotomy, stent diameter was chosen on the basis of the maximum size that could be inserted, taking into account the possible need for two or more stents in selected cases. Polyethylene stents (7, 10, or 11.5 F) were usually used for the first procedure.

Definition of Events

Technical success was defined as successful stent/drain insertion across the malignant stricture as determined by the operator after the first procedure. Therapeutic success was considered to have been achieved when a total bilirubin level of 40 μmol/L or lower was achieved. The number of procedures in which the same technique was used before therapeutic success was achieved and/or treatment was started was recorded. The TTS was calculated from the date of the first biliary drainage procedure to the date of first total bilirubin level measurement of 40 μmol/L or lower; patients without therapeutic success at the time of curative surgery or palliative surgical biliary bypass were censured at this time to calculate the TTS. Patients had regular follow-up until the beginning of antitumoral treatment, with serum bilirubin level values recorded at 7–10-day intervals. The time to treatment was calculated from the date of the first procedure to the start date of antitumor treatment. Overall survival time was calculated from date of first procedure to the date of last follow-up.