Endoscopic nasogallbladder tube or stent placement in acute cholecystitis: a preliminary prospective randomized trial in Japan (with videos)

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Background: There are currently no prospective, controlled trials of endoscopic transpapillary gallbladder drainage in patients with acute cholecystitis.

Objective: We evaluated the technical success rate and efficacy of endoscopic transpapillary gallbladder drainage by using either endoscopic nasogallbladder drainage (ENGBD) or endoscopic gallbladder stenting (EGBS) for patients with acute cholecystitis.

Design: Randomized, controlled study.

Setting: Tertiary-care referral centers.

Patients: Seventy-three consecutive patients with acute cholecystitis were randomized.

Interventions: ENGBD by using a 5F or 7F tube (n = 37) or EGBS (n = 36) by using a 7F stent.

Main Outcome and Measurements: Technical success, clinical success, adverse events, and procedure-related pain score.

Results: The overall technical success rates in the ENGBD and EGBS groups were 91.9% and 86.1%, respectively ($P > .05$). The mean procedure times of ENGBD and EGBS were 20.3 ± 12.1 and 22.2 ± 14.5 minutes, respectively ($P > .05$). The overall clinical success rates by per protocol analysis were 94.1% and 90.3% in the ENGBD and EGBS groups, respectively, whereas the rates by intention-to-treat analysis were 86.5% and 77.8%, respectively ($P > .05$). Moderate adverse events were observed in the ENGBD (n = 2) and EGBS (n = 1) groups. The mean visual analog score of postprocedure pain in the ENGBD group was significantly higher than that in the EGBS group (1.3 ± 1.1 vs 0.4 ± 0.8, respectively; $P < .001$).

Limitations: Small sample size and the participation of multiple endoscopists who may have different levels of experience in endoscopic transpapillary gallbladder drainage.

Conclusions: Both ENGBD and EGBS appear to be suitable for the treatment of acute cholecystitis in patients who are poor candidates for emergency cholecystectomy. (Clinical trial registration number: UMIN000012316.) (Gastrointest Endosc 2015;81:111-8.)

Abbreviations: AE, adverse event; EGBS, endoscopic gallbladder stenting; ENGBD, endoscopic nasogallbladder drainage; ES, endoscopic sphincterotomy; PEP, post-ERCP pancreatitis; PTGBD, percutaneous transhepatic gallbladder drainage; VAS, visual analog scale.

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Acute cholecystitis is one of the most common emergent GI diseases. Early or emergency cholecystectomy is the fundamental treatment for patients with acute cholecystitis who do not respond to initial conservative treatment.[1,2] Although cholecystectomy appears to be safe, the morbidity and mortality rates during and after cholecystectomy in critically ill and poor surgical patients are high.[2-4] Therefore, alternative nonsurgical measures should be used in high-risk patients such as gallbladder decompression by the percutaneous transhepatic approach or via an endoscopic approach.[5-7]

Although percutaneous transhepatic gallbladder drainage (PTGBD) is recommended in the guidelines for acute cholecystitis,[5] an endoscopic transpapillary approach appears to be suitable in patients in whom PTGBD is contraindicated, such as those with severe coagulopathy, thrombocytopenia, or an anatomically inaccessible location.[8] Endoscopic therapy by using endoscopic nasogallbladder drainage (ENGBD) or endoscopic gallbladder stenting (EGBS) has also been performed.[5-7] However, to the best of our knowledge, there are no prospective comparative studies regarding the efficacy of ENGBD and EGBS for acute cholecystitis.

We conducted a preliminary prospective, randomized, controlled, multicenter trial comparing the technical and clinical success rates between ENGBD and EGBS in patients with moderate and severe grades of acute cholecystitis.

METHODS

Patients

This randomized, controlled, multicenter trial was conducted between September 2012 and June 2013 at 6 large-volume endoscopic units that perform more than 400 ERCP procedures each year. The inclusion criteria were patients with acute cholecystitis based on the (1) symptoms, (2) laboratory data, and (3) imaging studies.[9] The exclusion criteria were as follows: (1) patients younger than 20 years of age and who are not considered as adults in Japan, (2) patients in whom the endoscopic approach was difficult because of problems with endoscope insertion (eg, trismus and gastric outlet obstruction), (3) patients with performance status 4 as defined by the Eastern Cooperative Oncology Group,[10] (4) pregnant patients, (5) patients with a surgically altered gastroduodenal and biliary anatomy, and (6) patients who were unwilling to participate or unable to provide written informed consent.

To date, there have been no prospective studies to determine the required sample size for comparing ENGBD and EGBS. Thus, as a pilot study, we enrolled approximately the same number of patients (ie, 33 patients in each group) as in a previous study that compared endoscopic nasobiliary drains with stents for biliary decompression in acute cholangitis[11] pending a large multicenter trial. All patients with acute cholecystitis had initially been treated with antibiotics and intravenous administration of lactated Ringer's solution, but without oral feeding. When patients were assessed to be good surgical candidates for emergency cholecystectomy, laparoscopic or open cholecystectomy was planned. Patients unsuitable for emergency cholecystectomy because of underlying comorbidities and clinical instability or those refusing surgical interventions were considered for endoscopic decompression of the gallbladder. Of these patients, those who failed to respond to medical treatment (n = 73) and those who were unsuitable for emergency cholecystectomy because of their general condition (n = 4) or the unavailability of a surgeon (n = 16) were randomized to undergo ENGBD or EGBS (Fig. 1). The patients were randomized in advance by using randomization software into an ENGBD group or an EGBS group and then distributed by a third person to the endoscopic center by using opaque sealed envelopes. Patients were randomized after the papilla was endoscopically visualized at the time of ERCP.

All patients provided written informed consent to undergo either ENGBD or EGBS. The study was approved by the institutional review board of our hospital (no. 2211). This trial was registered at UMIN (UMIN000012316).

Endoscopic drainage and evaluation

Transpapillary gallbladder drainage via the cystic duct has been used for approximately 30 years.[12] In the current study, drainage was performed without cessation of anticoagulation or antiplatelet drugs. The ENGBD and EGBS techniques were described in previous studies.[6,8] Briefly, after selective bile duct cannulation, a 0.025- or 0.035-inch guidewire (angle-tip, VisiGlide; Olympus Medical Systems, Tokyo, Japan) was advanced into the cystic duct and subsequently into the gallbladder (Fig. 2A). A hydrophilic guidewire (eg, Radifocus; Terumo Co, Ltd, Tokyo, Japan) was found to be especially useful for entering the cystic duct and passing through the valves of Heister. Finally, a 5F to 7F single-pigtail nasogallbladder catheter (Fig. 2B) or a 7F double-pigtail stent (Fig. 2C) was inserted into the gallbladder for ENGBD or EGBS (Videos 1 and 2, respectively; available online at www.giejournal.org). Endoscopic sphincterotomy (ES) was performed only if needed for the treatment of concomitant bile duct stones. All procedures were performed by skilled endoscopists at each institution who had performed at least 200 ERCP procedures and 20 ENGBD or EGBS procedures per year.

When ENGBD or EGBS was technically not possible or clinically ineffective, PTGBD, endoscopic nasobiliary drainage (ENBD), and endoscopic gallbladder aspiration were used as alternative procedures.

In this study, the primary endpoint was the technical success rate. The secondary endpoints were the clinical