

*Research Article***Endoscopic ultrasound-guided gallbladder drainage in patients with obstructive jaundice**

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Abstract

Background and study aim: Recently, endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) has emerged using a self-expandable metallic stent (SEMS). The aim of the study was to evaluate the long-term outcomes of this procedure. Also, the efficacy and safety of endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) with SEMS were assessed. **Patients and methods:** 16 Consecutive patients who underwent EUS-GBD for acute cholecystitis or obstructive jaundice between February 2014 and September 2016 were included in this retrospective study. EUS-GBD was performed under guidance of EUS and fluoroscopy, through puncturing the gallbladder with a needle, inserting a guidewire, dilating the puncture hole, and placing a SEMS.

Results: The rates of technical success, functional success and adverse events were 100%, 87.5%, and 93.75%, respectively. The median procedure time was 26.9 min (range 19 - 42 min). The median follow up time was 284 days (range 14 - 969 days) and during this follow up period recurrence of cholecystitis was observed in 6 patients (37.5%). **Conclusion:** EUS-GBD with a SEMS is a possible alternative treatment for acute cholecystitis or obstructive jaundice in high surgical risk patients. Long-term outcomes after EUS-GBD were promising.

Key words: Endoscopic ultrasound- guided gallbladder drainage; EUS-GBD; Cholecystitis.

Introduction

Laparoscopic cholecystectomy is currently considered the treatment of choice for most patients with acute cholecystitis⁽¹⁻³⁾.

In high surgical risk patients such as having advanced malignant tumor or severe other organ failure gallbladder drainage is considered an alternative method. Percutaneous transhepatic gallbladder drainage (PTGBD) is the gold standard method for gallbladder drainage^(4, 5). However, PTGBD has also several adverse events including bleeding, decreasing of patient's quality of life due to external drainage, and it is unsuitable for patients who have massive ascites or dementia, which may lead to the possibility of self-tube removal⁽⁶⁾.

For these conditions, percutaneous transhepatic gallbladder aspiration and endoscopic transpapillary gallbladder drainage with either nasobiliary drainage tube or stent placement are usually performed as alternative methods⁽⁷⁾.

Recently, endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) has emerged⁽⁸⁻¹⁵⁾. However; the long term follow up of EUS-GBD is still unclear.

The aim of this study was to evaluate long term outcomes of EUS-GBD in high risk patients with acute cholecystitis or cholangitis and obstructive jaundice who are not candidate for surgical intervention.

Materials and methods

In this study, consecutive patients who underwent EUS-GBD for acute cholecystitis or obstructive jaundice between February 2014 and September 2016 were retrospectively included. In our hospital, indication of EUS-GBD was the following: having advanced malignant tumor, severe other organ failures, or risk of self-tube removal.

The patients were continually followed up by blood tests and imaging modalities every 2-4 month.

Patients provided their written, informed consent for all procedures associated with the study. This study was approved by the Hospital's Institutional Review Board (IRB) for human research.

Technical tips of EUS-GBD

All patients were given antibiotics before prior to procedure. Also, all patients underwent/ had computed tomography (CT) the day after EUS-guided gallbladder drainage.

First, an echoendoscope (GF-UGT260; Olympus Optical, Tokyo, Japan) was introduced into the stomach or duodenum.

The echoendoscope was manipulated until an appropriate puncture route; free from interposing vessels using color Doppler was identified. The puncture site was selected as the region where the distance between the gastrointestinal tract and the gallbladder was smallest (1 cm or less). When both the stomach and duodenum provided equally good access, the duodenum was selected as the puncture site because it was easier to maintain the scope position at the duodenum than at the stomach.

The neck or body of the gallbladder was generally chosen as the ideal target and was then punctured with a 19G FNA needle (SonoTip Pro Control 19G; Medi-Globe GmbH, Rosenheim, Germany) under EUS guidance. Bile juice was aspirated and a small amount of contrast medium was injected.

Then, 0.025-inch guidewire (VisiGlide; Olympus Medical Systems, Tokyo, Japan) was

then inserted within the gallbladder through the FNA needle. Next, a fine gauge balloon catheter (4mm, REN; KANEKA, Osaka, Japan) was inserted, and the gallbladder and the intestine wall were dilated. After this procedure, fully covered self-expandable metal stent placement (FCSEMS; BONA stent, Standard Sci Tech Inc, Seoul, Korea) from the gallbladder to the intestine was performed under EUS and fluoroscopic guidance using intra-channel release technique.

Finally, a double pig tail plastic stent (7Fr, 10cm; Cook Medical, Bloomington, Indiana, USA) was placed within the metallic stent to prevent stent migration⁽¹¹⁾.

Results

Patients' characteristics

Total 16 patients (mean age 74.8 years, range 63-90 years; 11 males, 5 female) were enrolled in this study (Table 1). Ten patients were ASA class III and six patients were ASA class IV. Also, six patients had advanced malignancy (one patient had renal cell carcinoma with pancreatic metastasis, another patient had pancreatic cancer with liver and lymph node metastasis, another patient had combined pancreatic cancer and cholangiocarcinoma and three patients had advanced cholangiocarcinoma). On blood examination, the mean white blood cell (WBC) count was 9570/ μ l, and the mean C-reactive protein (CRP) was 12.86 mg/dl. Indications for EUS-GBD were acute cholecystitis (n = 13) and biliary obstruction due to cholangiocarcinoma (n = 3).

Table (1): Patients' characteristics

Parameters	Descriptive statistics (n=16)
Age (years)	
Range	(63-90)
Mean \pm SD	74.81 \pm 7.42
Sex	
Male	11(68.75%)
Female	5(31.25%)
Performance status	
I	1(6.25%)
II	13(81.25%)
III	2(12.5%)
Advanced malignancy	
No	10(62.5%)
Yes	6(37.5%)
WBC	
Range	(4.95-17.85)
Mean \pm SD	9.79 \pm 3.85
CRP	
Range	(0.37-36.07)
Mean \pm SD	12.86 \pm 9.72
Indication of EUS	
Acute Cholecystitis	13(81.25%)
Biliary obstruction due to cholangiocarcinoma	3 (18.75)
Underlying conditions	
III	10 (62.5%)
IV	6 (37.5%)

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