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Case Report

Successful endoscopic closure of an esophageal leak after endoscopic ultrasound-guided hepaticoesophagostomy by using n-butyl-2 cyanoacrylate

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ABSTRACT

Endoscopic ultrasound-guided hepaticoesophagostomy (EUS-HES) refers to EUS-guided biliary access from the abdominal part of the esophagus, an uncommon choice of route for biliary drainage. In the patient reported herein, an esophageal laceration and leakage at the site of placement of a metal stent occurred a few days after EUS-HES. To plug the laceration, 0.5 mL of n-butyl-2 cyanoacrylate mixed with 1 mL of lipiodol was injected through an endoscopic retrograde cholangiopancreatography catheter. We performed EUS-guided transgastric drainage for drainage of the peritoneal fluid collection. The procedures were successful and the laceration eventually healed, with no further leakage.

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Keywords: Endoscopic ultrasound-guided hepaticoesophagostomy; Esophageal leak; N-butyl-2 cyanoacrylate

Introduction

Endoscopic ultrasound-guided biliary drainage (EUS-BD) has been suggested as a useful alternate technique for BD after failed endoscopic retrograde cholangiopancreatography (ERCP).¹ Potential complications of this drainage procedure are bleeding, bile leak, stent migration, and peritonitis. Some of these complications could be potentially fatal and necessitate immediate surgical management. EUS-guided hepaticoesophagostomy (EUS-HES) provides EUS-guided biliary access from the abdominal part of the esophagus,^{2,3} and is not a commonly used route for BD. We present the case of a patient who developed the rare complication of esophageal leak at the site of an inserted metallic stent after EUS-HES and was managed successfully.

Case Report

The patient was a 69-year-old man diagnosed as having unresectable pancreatic head cancer, in whom BD for biliary obstruction was initially performed by EUS-guided choledochoduodenostomy (EUS-CDS), because abdominal computed tomography (CT) revealed stenosis of the 2nd portion of the duodenum and

obstruction of the lower bile duct by the pancreatic head cancer. He presented with repeated episodes of high fever, chills and liver dysfunction secondary to duodenobiliary reflux during palliative chemotherapy, because pneumobilia was continuously recognized and CT images revealed no evident occlusion of the EUS-CDS stent. Therefore, EUS-CDS was considered as an unsafe BD route, and EUS-guided hepaticocystostomy (EUS-HGS) was attempted as a salvage BD route after obtaining informed consent from the patient. Under endosonographic ultrasound guidance, we explored a puncture position for easy access to segment B2 under the diaphragm. We punctured the route with a standard 19-gauge needle, obtained segment B2 access and performed cholangiography. As a result, the route unintentionally became transesophageal under the diaphragm. After cauterized dilatation of the fistula with a 6.5 Fr cystotome, an 8 mm × 10 cm partially covered metal stent with a bare proximal end was eventually successfully introduced between segment B2 and the lower abdominal esophagus. The distal end of the stent was grasped with the forceps and moved into the stomach, thereby accomplishing EUS-HES (Fig. 1, 2).

The patient developed fever and abdominal pain within a few days after the EUS-HES. Abdominal CT revealed fluid collection and free air up to the lesser curvature of the stomach (Fig. 3).

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E-mail address: yushashi@east.ncc.go.jp (Y. Hashimoto). ORCID: <https://orcid.org/0000-0002-0777-4573>pISSN 2636-0004 eISSN 2636-0012 <https://doi.org/10.18528/ijgii180046>© This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Fig. 1. Endoscopic image of hepaticoesophagostomy.

Fig. 2. X-ray image of hepaticoesophagostomy.

Fig. 3. Abdominal computed tomography (CT) image after hepaticoesophagostomy. The abdominal CT image revealed fluid collection and free air up to the lesser curvature of the stomach (arrows).

Fig. 4. Esophagogastrography image after hepaticoesophagostomy (HES). A contrast leak was identified along the HES stent (arrows).

Esophagogastrography was performed and a contrast leak was identified along the HES stent (Fig. 4). Esophagogastroduodenoscopy revealed an esophageal laceration above the stent. To plug the laceration, 0.5 mL of NBCA (n-butyl-2 cyanoacrylate) mixed with 1 mL of lipiodol (two sessions) was injected through the ERCP catheter into the laceration (Fig. 5). We performed EUS-guided transgastric drainage with a 7 Fr nasoperitoneal and 7 Fr gastroperitoneal tube for drainage of the peritoneal fluid collection (Fig. 6). Intensive antibiotic and antifungal therapy was initiated. Sequentially obtained CT images revealed the NBCA as a high density adjoining the metal stent (Fig. 7). EUS identified a hyperechoic area with a strong acoustic shadow along the stent, consistent with the location of the injected NBCA. Esophagogastrography no longer showed any evidence of esophageal leak, thereby confirming healing of the laceration. The patient showed gradual clinical improvement, his nasoperitoneal tube was removed and he resumed oral intake on day 16 after the EUS-HES. Finally, he was discharged on day 37 after the EUS-HES. He

did not develop any episodes of cholangitis during the one-year follow-up.

Discussion

While it might be challenging, it must be important to handle severe adverse events such as stent migration, bile peritonitis and bile leak caused by EUS-BD. EUS-BD is mostly accomplished by EUS-CDS or EUS-HGS. EUS-HES is not the preferred method, because of the elevated risk of severe mediastinal complications such as mediastinitis or pneumomediastinum, although there is no available literature yet on the safety and usefulness of EUS-HES.^{1,4}

In this case, although we first attempted EUS-HGS, we performed EUS-HES instead. We were not aware of the risk of the complication of mediastinitis or pneumomediastinum, because we made sure that the puncture route was endosonographically

Fig. 5. Endoscopic image after injection of n-butyl-2 cyanoacrylate with lipiodol into the esophageal laceration (arrows).

Fig. 6. X-ray image after endoscopic ultrasound-guided transgastric drainage.

under the diaphragm and intraperitoneal. However, it should be remembered that the esophageal wall is thinner and more fragile than the stomach wall. To create the fistula, a 6.5 Fr cauterized cystotome was used and an oblique laceration was made in the thin esophageal wall. The 8-mm stent was not sufficient to plug the laceration, since its proximal end was pulled down with the forceps into the stomach. The stent was therefore bent at the laceration, which could have been the cause of the esophageal leak after the EUS-HES.

TTSC (through-the-scope clip), gastrointestinal stent and NBCA were utilized for the gastrointestinal perforation and fistula

Fig. 7. Computed tomography image one month after injection of n-butyl-2 cyanoacrylate (arrows).

creation.⁵ This case was challenging, because the laceration was not beneficial from the point of view of the TTSC or gastrointestinal stent due to the technical difficulty. NBCA injected through the ERCP catheter was the most suitable material to seal the laceration. The NBCA plugged the laceration and facilitated healing of the esophageal laceration. Follow-up CT showed the persistent presence of the NBCA at one month, as shown in Fig. 4. NBCA is known as a cheap dermal bond. In the presence of tissue moisture, it immediately polymerizes into a solid substance that firmly adheres to the tissue. It is not affected by gastric or pancreatic enzymes. In the field of surgery, NBCA has been applied for post-surgical fistula closure.⁶

We have described a case that developed the rare complication of esophageal leak along the stent after EUS-HES, which was successfully treated by injection of NBCA.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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