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Endoscopic computerized tomography guided percutaneous trans-gastric drainage: A case report on this hybrid approach

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ABSTRACT

Percutaneous drainage, percutaneous transgastric drainage, and endoscopic ultrasound (EUS)-guided transgastric drainage are primarily utilized for drainage of fluid collections dorsal to the stomach. Percutaneous transgastric drainage is performed with computed tomography (CT) guidance, but it requires inflation of a balloon in the stomach, and gastric peristalsis makes it difficult to ensure a reliable puncture route via the stomach. Using endoscopy-assisted CT-guidance, we were able to safely and effectively perform percutaneous transgastric drainage.

A 69-year-old man underwent a pancreaticoduodenectomy for cancer of the inferior section of the common bile duct. Postoperative day 5, the amylase value of the drainage fluid was 1,232 IU/L, we diagnosed a pancreatic fistula developed as a result of pancreaticojejunal anastomotic failure and we performed drainage at the drain which was placed in the foramen of Winslow intraoperatively, however fluid collection dorsal to the stomach was detected on a follow-up abdominal CT scan, and the fluid was a high value of amylase, we judged the drain was not working well and the pancreatic fistula occured. Endoscopy-assisted, CT-guided percutaneous transgastric drainage was therefore performed, and the pancreatic fistula was successfully closed the fistula.

1. Introduction

Percutaneous drainage [1], percutaneous transgastric drainage [2], and endoscopic ultrasound (EUS)-guided transgastric drainage [3] have been primarily used for drainage of fluid collections dorsal to the stomach. Using endoscopy-assisted CT-guidance, we were able to safely and effectively perform percutaneous transgastric drainage.

2. Case presentation

A 69-year-old man was admitted to our hospital with a complaint of jaundice. He has been receiving hemodialysis for diabetic nephropathy and chronic renal failure elsewhere and was referred to us. On admission, his height was 160 cm, his weight was 63 kg, and BMI was 24.6 kg/m^2. There were no noteworthy findings on chest and abdominal examinations. An abdominal CT showed an enhanced lesion in the inferior section of the common bile duct and biopsy detected adenocarcinoma. Based on these findings, a diagnosis of cancer of the common bile duct was made. We therefore decided to perform a pancreaticoduodenectomy. Operation time was 545 minutes and bleeding was 580 ml. Intraoperatively, there was nothing in particular the operation, reconstruction was the child procedure, and a drain was placed in the foramen of Winslow in order to drain this area. Postoperatively, jaundice was improved and hemodialysis performed on schedule.Postoperative day 5, the amylase value of the drainage fluid was 1,232 IU/L, we diagnosed a pancreatic fistula developed as a result of pancreaticojejunal anastomotic failure and we performed drainage at the drain which was placed in the foramen of Winslow intraoperatively. Fluid collection with a diameter of 30 mm and low density dorsal to the stomach was recognized on a follow-up abdominal CT, suggestive of poor drainage. Drainage of this site was then performed. On abdominal CT, the drain was visible near the site of the pancreaticojejunostomy, with no fluid collection in the surrounding area. However, fluid collection was recognized dorsal to the stomach (Fig. 1). No

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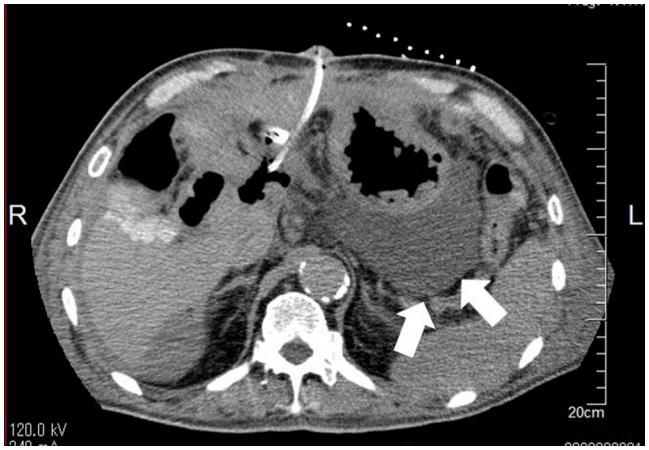

Fig. 1. Fluid collection dorsal to the stomach (arrow).

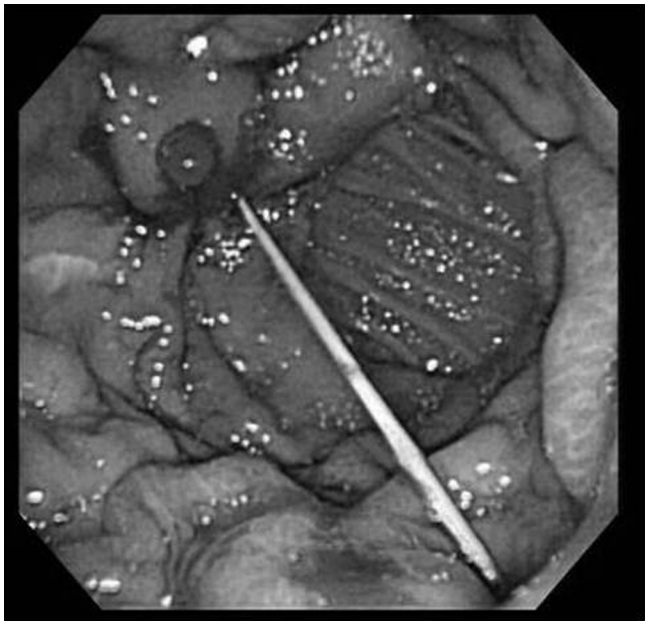

Fig. 2. Percutaneous insertion of the puncture needle and puncture to the posterior wall are observed by endoscopy.

other fluid collection was seen in any other areas of the peritoneal cavity.

We carried out an endoscopic computerized tomography guided percutaneous trans-gastric drainage procedure observing the following technical details. The procedure was under the local anesthesia. First, the puncture route was determined by abdominal CT scan, and a nasal endoscope was inserted to observe the stomach. Next, we located the puncture route into the stomach. Ideal Lifting® (Sumitomo Bakelite Inc., Tokyo, Japan) was then inserted near the planned puncture site, and fixation to the abdominal and gastric walls was performed with 2-0 nylon sutures. Under CT guidance, an 18G needle was advanced toward the site of the fluid collection. Endoscopic observation was performed during transdermal insertion and puncture of the posterior wall of the stomach (Fig. 2). A 0.035-in. diameter/145-cm-long Amplatz Extra Stiff Guidewire® (Boston Scientific Corporation, Quincy, MA, USA) was inserted into the needle and placed. The needle was extracted, and an 8-Fr dilator was inserted with the same dimension and type of Amplatz Extra Stiff Guidewire®. After the fistula was dilated, an 8F Mini-Pigtail Drainage Catheter was inserted. The catheter was aspirated, and suction of the fluid content was confirmed. Finally,

Fig. 3. After the catheter placement, the catheter tip is confirmed to be at the fluid collection site on abdominal CT (arrow).

the catheter tip was confirmed on abdominal CT scan, and the procedure was completed (Fig. 3). The procedure took 15 min after insertion of the endoscope. A follow-up abdominal CT scan showed no fluid collection at dorsal to the stomach which performed procedure after 3 days.

3. Discussion

Methods to drain fluid collections dorsal of the stomach include percutaneous drainage [1], percutaneous transgastric drainage [2], and EUS-guided transgastric drainage [3]. Currently, EUS-guided drainage is the most commonly used technique [4–6] because this modality also provides a real time opportunity to target the required area while avoiding adjacent vascular and other structures [7].

In this case, however, monitoring of the amount and properties of the fluid collection with external drainage was crucial. Since EUS-guided drainage has a major disadvantage due to its nasal drainage route, which causes discomfort to the patient, we chose to perform percutaneous transgastric drainage.

Percutaneous transgastric drainage was first reported on by Ho and Taylor in 1984 [2]. In their case, a puncture of a cyst was performed via the percutaneous and transgastric route. They used endoscopic ultrasound for pancreatic pseudocyst dorsal to the stomach and thus made an internal fistula between the stomach and the pancreatic cyst. Various methods of percutaneous transgastric drainage have been reported since the report of Ho and Taylor. In these reports, puncture was performed under ultrasound or CT guidance.

In the present case, however, CT-guided puncture was selected because a good image of the pancreas could not be obtained with ultrasonography due to gas in the gastric cavity. The procedure in this case was done using an endoscope. The advantages of endoscopy are as follows: (1) Fixation can be done safely, since air is supplied with the endoscope and fixation of the gastric wall is done while observing the gastric lumen. (2) The puncture can be performed safely because space is eliminated by fixation of the gastric and abdominal walls. (3) Later catheter exchange is easy since the gastric and abdominal walls are not separated even after puncture. (4) Finally, the procedure can be performed with greater safety with observation from various angles using CT and endoscopy.

4. Conclusion

Comparisons of endoscopic Computerized tomography guided percutaneous trans-gastric drainage with percutaneous drainage and EUS-guided drainage reveal that endoscopic Computerized tomography guided percutaneous trans-gastric drainage was easier for surgeons to perform, takes less time, and caused less discomfort to the patient. Therefore, it appears that this was a very useful and advantageous technique.

Conflict of interests

The authors declare no conflict of interests for this article.

Funding

None.

Ethical approval

Written informed consent was obtained from the patients for publication of these case reports and accompanying images.

Consent

This patient was properly informed and gave consent for her clinical information to be included in an Elsevier publication.

Author contribution

Nobuhiro Tsutsui performed the surgery, wrote the manuscript and is responsible for the information.
Eigoro Yamanouchi performed the surgery.
Masashi Yoshida reviewed critically the manuscript.
Hironori Ohdaira reviewed critically the manuscript.
Nobuhiro Saito performed the surgery.
Yutaka Suzuki reviewed critically the manuscript.

Guarantor

Nobuhiro Tsutsui is the guarantor of this paper.

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