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Case Report

Colonoscopy-assisted Placement of Percutaneous Endoscopic Gastrostomy: Report of Two Cases

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ABSTRACT: Occasionally, percutaneous endoscopic gastrostomy placement cannot be completed due to anatomical reasons, such as the position of other organs. The location of the transverse colon ventral to the stomach made it difficult to prevent the accidental puncture of the colon in two elderly patients with dysphasia. We adjusted the position of the colon to clear the route to the stomach for puncture and safe gastrostomy tube placement. This technique of using a colonoscope to push and bend the transverse colon inferiorly, which allowed us to successfully achieve gastrostomy placement without any adverse events, is an easy and effective method for moving interposed transverse colon segments for gastrostomy placement.

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KEYWORDS: percutaneous endoscopic gastrostomy, colonoscope, gastrocolocutaneous fistula

Introduction

Percutaneous endoscopic gastrostomy (PEG) is widely used as a route of enteral nutrition for patients with dysphagia and head and neck cancers. However, complications such as bleeding, aspiration pneumonia, wound infection, and accidental puncture of interposed organs are frequently observed.^{1,2)} Although various techniques, including application of digital pressure to the abdominal wall, transillumination, and confirmation by fluoroscopy, have been used to prevent the accidental puncture of other organs, it can occur due to anatomical reasons. Here we report two cases of successful PEG placement using colonoscopy to move the transverse colon interposed between the stomach and abdominal wall during PEG to prevent accidental puncture. This case report was reviewed and approved by the Institutional Review Board of Toho University Ohashi Medical Center (approval #H17041).

Case Presentation

Case 1: a 75-year-old woman

The patient had dementia and brain infarction causing dysphasia and was hospitalized due to repeated pneumonia. PEG placement was planned because of dysphasia. Computed tomography (CT) before the procedure revealed that the transverse colon was not interposed between the stomach and abdominal wall. Fluoroscopy during PEG, however, revealed a large volume of gas in the transverse colon, and the insufflation of air into the stomach could not move the gas in the transverse colon inferiorly from the ventral part of the stomach. Therefore, PEG was rescheduled for another day. As a pretreatment, the patient was given a laxative (75 mg of sodium picosulfate), but this did not affect the gas in the transverse colon (Fig. 1). Therefore, we used a colonoscope to physically move the colon; we inserted a colonoscope to the level of the he-

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patric flexure and inverted and pushed it to bend the transverse colon inferiorly. The movement of the transverse colon, which had been located between the stomach and abdominal wall, allowed us to prevent its accidental puncture inferiorly and to place the PEG tube safely (Fig. 2). The PEG tube was placed using the modified introducer method with an Ideal Button (24 Fr) (Olympus, Tokyo, Japan). There were no complications after the operation, and the absence of accidental puncture of the colon was confirmed by CT one week later (Fig. 3).



Fig. 1 Fluoroscopic image before the operation.

Fluoroscopic image before PEG reveals the presence of gas in the transverse colon superior to the gastric bubble.

Case 2: an 83-year-old man

The patient was hospitalized due to pneumonia. His past history included cardiac infarction and chronic atrial fibrillation. PEG placement was planned after dysphagia was noted. CT before the operation revealed that the transverse colon was located between the stomach and abdominal wall (Fig. 4). Therefore, similar to Case 1, this patient was given a laxative (75 mg of sodium picosulfate) as a pre-treatment. A colonoscope was inserted before PEG placement and was pushed to bend the transverse colon inferiorly. By moving the transverse colon inferiorly, it was no longer located between the stomach and abdominal wall, thereby allowing us to place the PEG tube safely (Fig. 5). The pull method was used to place the PEG tube with a One-Step Button (24 Fr) (Boston Scientific, Natick, MA,



Fig. 3 CT image one week after PEG placement. PEG was placed without the accidental puncture of the transverse colon.

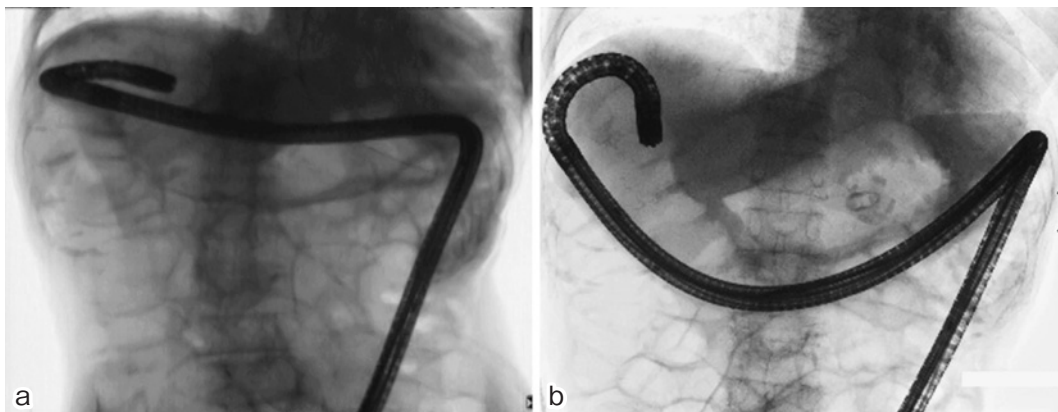


Fig. 2 Fluoroscopic images during PEG.

- a. A colonoscope was inserted to the level of the hepatic flexure.
- b. The transverse colon was subsequently bent inferiorly to clear the route to the stomach for puncture and PEG placement by pushing the colonoscope.

USA). There were no complications after the operation, and the absence of accidental puncture of the colon was confirmed by CT 1 week later. Written informed consents were obtained from both the patients before the procedure.

Discussion

The location of the transverse colon ventral to the stomach made it difficult to prevent the accidental puncture of the colon by ordinary PEG placement procedure in two patients. We adjusted the position of the colon to clear the route to the stomach for puncture and safe PEG placement.

Although PEG is considered a minimally invasive technique, there are various associated complications, including the accidental puncture of interposed organs, particu-

larly the colon, the accidental puncture of which has long been reported.³⁻⁵⁾ The occurrence of gastrocolocutaneous fistula is low and is estimated to be 1.3%-3%.^{6,7)} This complication may be later found by feculent odor from PEG stoma and/or undigested formula in patients' feces. In addition, it cannot be identified in many patients until the replacement of the PEG tube. Whenever it is found, not only does the PEG tube have to be removed but the existing fistula also has to be closed and a new PEG has to be created, placing a great burden on the patient.

In recent reports, CT has been useful for determining the existence of interposed organs between the stomach and abdominal wall. When the presence of such organs was confirmed, PEG was performed with the assistance of laparoscopy.⁸⁾ In such patients, however, it is often difficult to conduct PEG placement using the conventional technique. Moreover, the position of the unfixed colon greatly varies: such as in Case 1, the transverse colon is unexpectedly located anterior to the stomach at the time of PEG placement despite no appearance of interposed colon in the preprocedural CT. When interposed organs are located ventral to the stomach, laparoscopy-assisted PEG or surgical gastrostomy is often performed. However, patients requiring PEG for dysphasia are often debilitated, being less tolerant of invasive procedure; therefore, minimally invasive techniques should be desirable. The other option is percutaneous transesophageal gastro-tubing (PTEG),⁹⁾ which requires a high degree of skill and the maintenance and replacement of which is rather complex.

Colonoscopy-assisted placement of PEG in the presence of an interposed colon has been previously reported. When

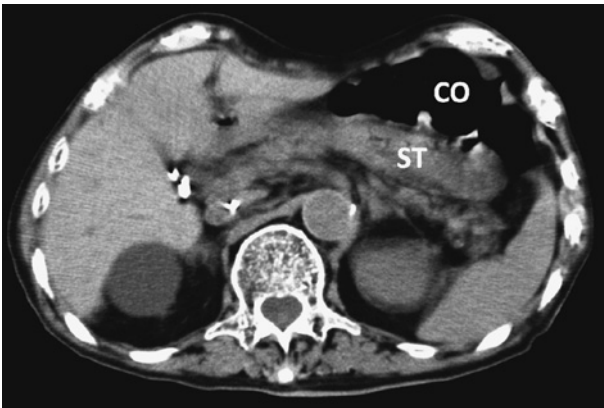


Fig. 4 CT image before gastrostomy.

The transverse colon was located in front of the stomach. CO: colon, ST: stomach

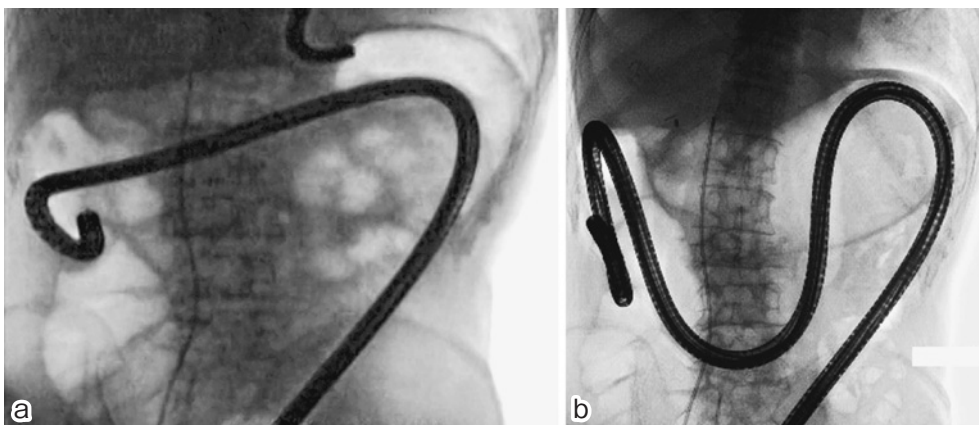


Fig. 5 Fluoroscopic images during PEG.

- A colonoscope was inserted to the level of the hepatic flexure.
- The transverse colon was subsequently bent inferiorly to clear the route to the stomach for puncture and PEG placement by pushing the colonoscope.

the sigmoid colon is interposed, PEG can be placed by straightening a bent sigmoid colon, located ventral to the stomach, using a colonoscope.¹⁰⁾ When the transverse colon is interposed, PEG can be placed after moving the transverse colon from the ventral part of the stomach by twisting and pulling the colonoscope.^{11, 12)} Compared with these techniques, our technique, which uses a colonoscope to push and bend the transverse colon inferiorly, is very simple. In the two patients we encountered, we cleared the route to the stomach from the skin by inserting the colonoscope to the level of the hepatic flexure and pushing it to move the central part of the transverse colon inferiorly. When it comes to preparation for colonoscopy, we only used 75 mg of sodium picosulfate through a nasogastric tube, which did not render the procedure cumbersome. Possible limitations of the present procedure include the simultaneous insertion of two endoscopes requiring more endoscopists compared with ordinary PEG placement and the need for the preparation of colonoscopy.

This technique of using a colonoscope to push and bend the transverse colon inferiorly is an easy and effective method for the transverse colon to stay in front of the stomach.

Conflicts of interest: None declared.

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