

CASE REPORT

경피 내시경하 위루술로 발생한 합병증 및 치료 2예

이현주, 정록선, 박민선, 표정희, 김승영, 현종진, 정성우, 구자설, 이상우, 최재현

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Two Cases of Uncommon Complication during Percutaneous Endoscopic Gastrostomy Tube Replacement and Treatment

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We presented two interesting cases of gastrocolocutaneous fistula that occurred after percutaneous endoscopic gastrostomy (PEG) tube placement, and its management. This fistula is a rare complication that occurs after PEG insertion, which is an epithelial connection between mucosa of the stomach, colon, and skin. The management of the fistula is controversial, ranging from conservative to surgical intervention. Endoscopists should be aware of the possibility of gastrocolocutaneous fistula after PEG insertion, and should evaluate the risk factors that may contribute to the development of gastrocolocutaneous fistula before the procedure. We reviewed complications of gastrostomy tube insertion, symptoms of gastrocolocutaneous fistula, and its risk factors. (*Korean J Gastroenterol* 2014;63:120-124)

Key Words: Gastrostomy; Complication; Fistula

INTRODUCTION

Since its introduction in the 1980s, percutaneous endoscopic gastrostomy (PEG) tube insertion has been a widely accepted approach to achievement of enteral nutritional support. Complications, such as wound infection, leakage, hemorrhage, perforation, tube migration, and buried bumper syndrome may follow PEG tube insertion.^{1,2} Gastrocolocutaneous fistula, a connection between stomach, colon, and skin, is a rare complication that may occur in patients, particularly those with neurologic disorders. Symptoms due to gastrocolocutaneous fistula range from severe peritonitis to no symptom at all.³ When fistula is suspected, it can be diagnosed by fistulography, with injection of barium or gastro-

grafin through the tube, abdominal CT, gastroscopy, and colonoscopy.⁴ We reported on two cases of patients who presented with gastrocolocutaneous fistula after PEG tube insertion, and its management. In the first case, only conservative management was administered, and in the second case, endoscopic clipping was performed.

CASE REPORT

1. Case 1

A 65-year-old man, who was in a bed-ridden state due to a right cerebellum infarct eight years ago, suffered from a repeated aspiration pneumonia event. He underwent PEG tube insertion, which was performed under upper endoscopic

Received April 29, 2013. Revised June 10, 2013. Accepted June 27, 2013.

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Financial support: None. Conflict of interest: None.

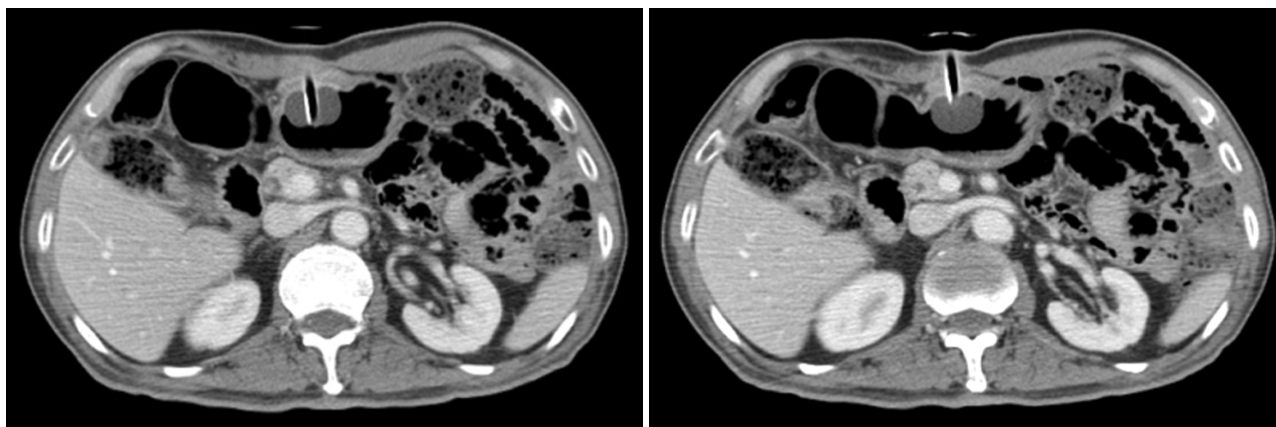


Fig. 1. Percutaneous endoscopic gastrostomy tube penetrating the mid portion of the transverse colon.

visualization. The patient was placed in a supine position, and the stomach was inflated with air. A trocar needle was inserted through the abdominal wall into the stomach by endoscopic visualization, and a guide wire was introduced into the gastric lumen using a trocar needle. The guide wire was pulled out through the mouth, and a gastrostomy tube was tied to the guide wire. The guide wire and gastrostomy tube were pulled through the mouth into the stomach again and passed through the abdominal wall together. The patient showed no immediate complication and experienced no additional adverse events for six months.

After six months, he was admitted for PEG tube replacement. When the new PEG tube was passed through the abdominal wall from the stomach, it was stained with fecal material. Gastrocolocutaneous fistula was suspected, and abdominal CT was performed. On the abdominal CT, a PEG gastrostomy tube penetrated the mid portion of the transverse colon (Fig. 1). In addition, passage of the PEG tube through the transverse colon was confirmed by colonoscopy (Fig. 2). There was no evidence of acute inflammation around the penetration site. However, the patient developed fever and abdominal tenderness after replacement of the PEG tube. Although there was no increase in the patient's white blood cells (WBC) count or CRP level, because he showed suspected symptoms of peritonitis, we recommended surgical management, however, the patient refused to undergo surgery. Without surgical intervention, antibiotics (ceftriaxone and metronidazole) were administered, and the misplaced PEG tube was removed. Antibiotics were administered for two weeks, and, after improvement of the patient's general condition, a gastrostomy tube was reinserted using a fluoro-

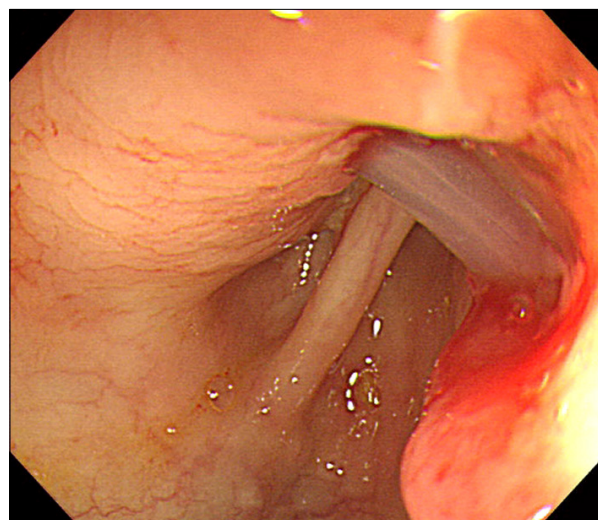


Fig. 2. Percutaneous endoscopic gastrostomy tube passing through the transverse colon.

scopic-guided procedure (18 Fr). For over one year, the patient remained uneventful with gastrostomy tube feeding.

2. Case 2

A 47 year-old-man who was bed-ridden due to traumatic subdural hematoma underwent PEG tube insertion without acute complication and remained uneventful for one year, until the second gastrostomy tube change. PEG tube insertion was performed using the same method explained in the previous case, using the same PEG tube. He was admitted due to gastrostomy tube removal, and when a new gastrostomy tube was inserted, fecal material was observed on the tube. Abdominal CT was performed to determine the existence of gastroenterofistula, and in the CT finding, a fistulous track was observed between the abdominal wall and

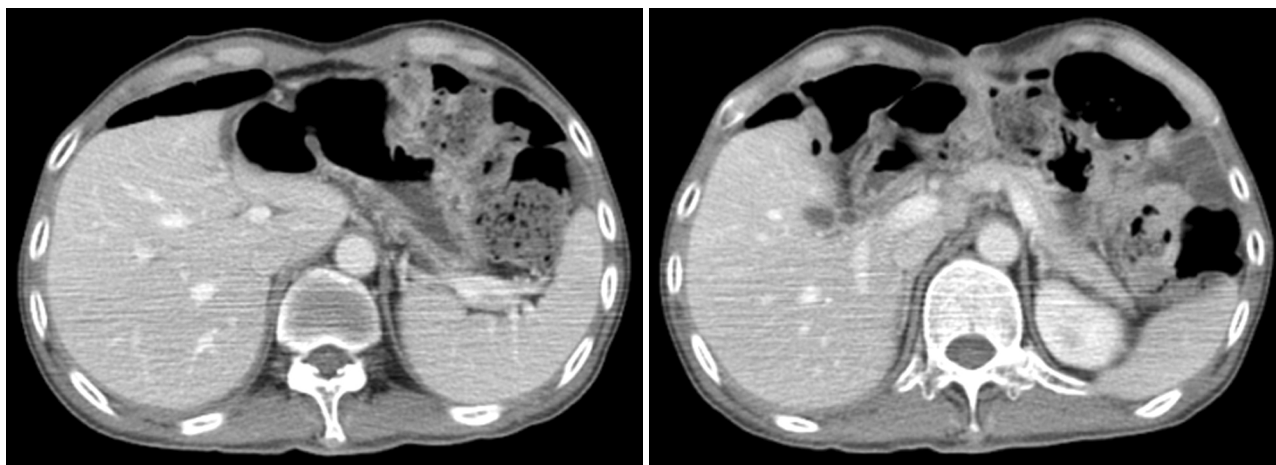


Fig. 3. Fistulous track between the abdominal wall and transverse colon.

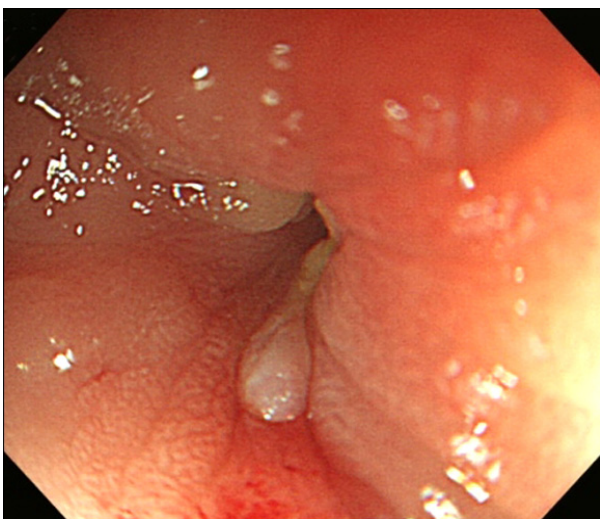


Fig. 4. Fistular opening on the transverse colon.

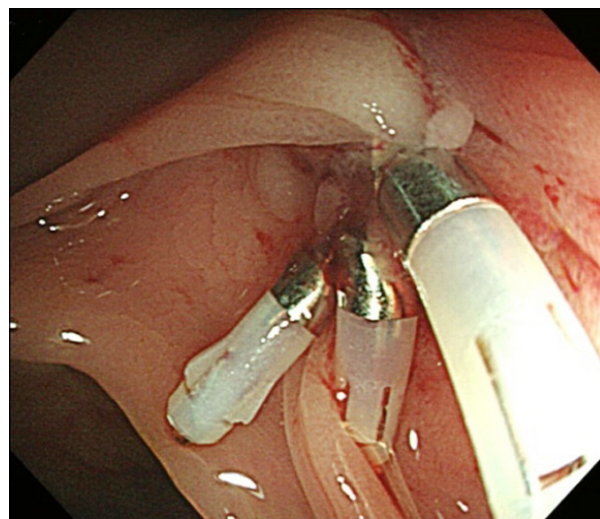


Fig. 5. Clipping performed on the site of the fistular opening.

transverse colon, which was suspected to be connected to the stomach (Fig. 3). In addition, colonoscopy was performed, and a fistular opening was observed on the transverse colon (Fig. 4). When the transverse colon was inflated with air, an air bubble was seen on the abdominal cutaneous fistular opening, indicating the presence of a colocutaneous fistula. Clipping was performed on the site of the fistular opening (Fig. 5), and after clipping, no more air bubbles were observed on the abdominal cutaneous fistular opening. After the clipping procedure, the patient showed fever and mild elevation in WBC count ($14,180/\mu\text{L}$), therefore, antibiotics (ciprofloxacin and metronidazole) were administered. Three days after antibiotic treatment, the patients' laboratory findings and his symptoms showed improvement, therefore, per-

cutaneous gastrostomy was inserted using a sono-guided procedure (18 Fr). The patient received antibiotics for 10 days, and was discharged. There was no occurrence of complication during three months of follow-up.

DISCUSSION

PEG is a safe and effective procedure for enteral nutrition, and has been widely used since its first introduction in the 1980s. The most common indication for PEG tube placement is neurologic disorders such as stroke or traumatic irreversible brain damage.^{1,2,4}

Complications that can occur after PEG tube insertion include wound infection, leakage, hemorrhage, perforation,

tube migration, and buried bumper syndrome.^{1,2,5} Gastrocolocutaneous fistula is a rare complication that occurs during PEG tube insertion. Khattak et al.⁶ reported a 2-3% incidence of gastrocolic or gastrocolocutaneous fistula during PEG tube insertion, and Okutani et al.⁷ reported incidence of this complication rate of 0.76%. In many cases, the gastrocolocutaneous fistula does not manifest any symptoms or signs in the first place, and they are usually recognized during or after replacement of the PEG tube.³

In some cases, even after several events of PEG tube change, there may be no peritoneal symptoms or signs, and gastrocolonic fistula may only be found by imaging studies such as abdominal CT or barium injection through the PEG tube. Clinical symptoms manifested by gastrocolocutaneous fistula include abdominal pain, fecal discharge around the tube and, in cases when the tube tip is located in the transverse colon after tube dislocation, the patient would show diarrhea after feeding.^{3,6,7}

Several factors are responsible for gastrocolocutaneous fistula complication during PEG tube insertion. The most common indication of PEG tube insertion is neurologic disorder, and these patients tend to have abnormal posture and spinal deformity, which may contribute to abnormal positioning of the stomach, resulting in injury of other viscera during gastrostomy tube insertion. Excessive inflation of air into the stomach during the PEG tube insertion procedure may also be responsible for gastrocolocutaneous fistula. Excessive air in the stomach can cause anterior rotation of the greater curvature of the stomach and this can carry gastrocolic omentum and transverse colon anterior to the stomach.⁸ Previous abdominal surgery may also contribute to development of gastrocolocutaneous fistula.^{3,9}

In our first case, the patient was in a bed-ridden state due to cerebellum infarction, which might be a risk factor for dislocation of the transverse colon to the anterior part of the stomach, and the gastrocolocutaneous fistula resulted from the initial gastrostomy insertion procedure; however, as there were no recognizable symptoms of gastrocolocutaneous fistula, the fistula was first noted during PEG tube replacement. Because the patient presented with fever and abdominal pain after PEG tube replacement and he refused the surgical intervention, conservative management with antibiotics was administered. The fistula is presumed to have closed spontaneously, as the patient's clinical symptoms and laboratory

findings improved.

Our second case also presents a patient with neurologic disorder. The gastrocolocutaneous fistula was not recognized until the third gastrostomy tube change. In the second case, the clips successfully closed a colonic opening. In the first case, after antibiotic management, a gastrostomy tube was inserted by fluoroscopic-guided procedure and in the second case, sono-guided procedure. Both methods allow real-time moving images during the procedure, however, the fluoroscopic-guided procedure uses contrast and X-rays, a form of ionizing radiation.

There is no gold standard for management of colocolocutaneous fistula due to misplacement of the PEG tube, ranging from conservative to invasive exploration of the colon. Hwang et al.⁴ suggested that spontaneous closure of the fistula can be disturbed by delayed gastric emptying or leakage of gastric juice through the fistula, and endoscopic treatments would be helpful in wound healing. On the other hand, Gyökeres et al.¹⁰ suggested that intervention like surgery is not always needed because uncomplicated fistula closure usually occurs spontaneously within a few days to weeks. Recent reviews have also suggested that conservative management is sufficient for management of a well-established fistula.^{3,10}

The two cases mentioned above showed a rare complication of a PEG tube insertion, gastrocolocutaneous fistula, and showed two different methods for management of gastrocolocutaneous fistula. Therefore, endoscopists should be aware that gastrocolocutaneous fistula may occur during PEG tube insertion, particularly in patients with risk factors such as neurologic disorders, and should try to minimize the complications.

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