Case Report

A Rare Case of Gastrojejunocutaneous Fistula after Percutaneous Endoscopic Gastrostomy

Atsushi Okita\textsuperscript{a,b}\textsuperscript{*}, and Jun Ohtani\textsuperscript{b}

\textsuperscript{a}Department of Surgery, Okayama City Hospital, Okayama 700-8557, Japan,  
\textsuperscript{b}Department of Surgery, Unnan City Hospital, Unnan, Shimane 699-1221, Japan

We report a rare case of fistulation to the jejunum after percutaneous endoscopic gastrostomy (PEG). An 85-year-old man with previous cerebral infarction and swallowing disturbance underwent PEG. Nine months later, he developed a high fever and discharge around the gastrostomy button. He was diagnosed with aspiration pneumonia, and administered antibiotic therapy. Examination showed digestive fluid around the gastrostomy button. Gastrointestinal contrast-enhanced CT revealed a gastrojejunocutaneous fistula. The button was removed, and the fistula closed naturally. PEG was performed again. The patient’s postoperative course was uneventful. Gastrojejunocutaneous fistula should be considered in cases involving increased discharge from a gastrostomy fistula.

Key words: percutaneous endoscopic gastrostomy, gastrojejunocutaneous fistula

Percutaneous endoscopic gastrostomy (PEG) was first reported in 1980 [1] and has since been widely accepted as faster, safer, and more effective than classical laparotomy procedures. PEG is a relatively common procedure, but is known to be associated with various complications. The frequency of complications after the endoscopic installation of enteral feeding tubes has been reported to range from 8-30%, and serious complications requiring treatment occur in about 1-4% of cases [2]. The most common complications include wound infection, pneumoperitoneum, and feeding tube-related mechanical problems, such as tube blockage [3]. Enterocutaneous fistulas, on the other hand, are very rare. We report a case in which a gastrojejunocutaneous fistula developed nine months after PEG.

Case Report

An 85-year-old man presented at Unnan City Hospital with stool-like peristomal leakage from a gastrostomy button together with abdominal fullness and fever. He had previously suffered a cerebral infarction, resulting in a swallowing disturbance and aspiration pneumonia, and had undergone PEG using the introducer technique. He subsequently received care at home. Four months later, the gastrostomy tube was uneventfully replaced with a gastrostomy button.

Nine months after the PEG procedure, the patient developed a fever of 39.2°C. A discharge composed of stool-like digestive fluids was seen around the gastrostomy button, and enteral feeding was stopped. Three days later, the amount of the peristomal discharge had increased and the patient visited our hospital. He was diagnosed with aspiration pneumonia with left pleural effusion. As a result, he was admitted and treated with
antibiotic therapy combined with thoracic drainage. On admission, green-brown digestive fluid was observed around the gastrostomy button during an abdominal physical examination (Fig. 1), but no signs of peritoneal irritation were detected. Contrast-enhanced radiography performed via the gastrostomy fistula on day three showed that the contrast medium had flowed into the jejunum. Gastrointestinal contrast-enhanced computed tomography (CT) performed on day 5 revealed a gastrojejunocutaneous fistula, but the tip of the gastrostomy button was located in the stomach (Fig. 2, 3). The amount of drainage fluid was low, and so the gauze used to collect it did not have to be replaced frequently. We opted for conservative therapy because of the likelihood of spontaneous fistula closure. Therefore the gastrostomy button was removed immediately. By day 16, the fistula had closed naturally. On day 18, a nasogastric tube was inserted and enteral feeding was started. On day 41, under CT, the stomach was directly punctured superior to the previous PEG site with a needle, and a guidewire was inserted into the stomach. Under endoscopy, a gastrostomy tube was then inserted using the “pull” technique. The patient’s postoperative course was uneventful, and he was transferred to receive care at home on day 89.

**Discussion**

Post-PEG gastrointestinal fistulas are rare [4], with a reported incidence ranging from 2-3% [5]. In particular, fistulation to the small bowels after PEG is extremely rare [5]. Although Mago et al. [6] reported that it is possible for gastrostomy tubes to be misplaced in the intestine, they did not indicate the actual loca-

---

Fig. 1 A discharge composed of digestive fluids was noted around the gastrostomy button.

Fig. 2 An axial computed tomography scan after the injection of contrast medium via the gastrostomy fistula. The colon was stained as fluoroscopy had been performed two days earlier. The jejunum was located on the right side of the gastrostomy tube between the stomach and abdominal wall, and was stained. White arrow: PEG button, arrowhead: the jejunum.

Fig. 3 A schematic representation of the location of the PEG button, stomach, and jejunum.
tion of the misplaced tubes (i.e., whether they were in the colon or small bowel). Bui et al. [7] were the first to report fistula formation in the small intestine after PEG; however, since their report, only 7 cases (in 6 reports) of such fistulas have been described in the literature (Table 1). All but one of these cases involved young patients. The patients’ initial clinical symptoms were intestinal obstruction in 3 cases, discharge around the gastrostomy site in 2 cases, and diarrhea in 2 cases. As for the treatments employed, 6 patients underwent laparotomy and surgical gastrostomy, and conservative therapy (tube removal) was successful in the remaining case.

The mechanism responsible for the formation of post-PEG fistulas is multifactorial. Bui et al. [7] focused on the patient’s position during the PEG procedure and suggested that a semi-sitting position might help the intestine to drop below the level of the stomach. Evans et al. [8] found that a large amount of air was introduced into the jejunum during PEG, and that the resultant distension of the jejunum pushed the transverse mesocolon upwards, which led to the tube penetrating the elevated jejunum and passing through the mesocolon into the stomach. Kubiak et al. [4] reported that during the PEG procedure, a portion of the jejunal loop moved upwards and became attached to the anterior abdominal wall. In addition, local infection and tight application of the external retention flange to the skin induced local inflammation leading to tube migration. De Vogelaere et al. [9] reported that the wall of the ileum was interposed between the abdominal wall and the stomach, and caught by the introducer needle, thus leading to its gradual erosion, and the tube passed into the ileum over weeks.

Meanwhile, Patwardan et al. [5] suggested that an abnormal posture and spinal deformities contribute to abnormal positioning of the stomach and might be responsible for the increased incidence of post-PEG fistulas. In addition, because the point of entry of the PEG tube was located in the posterior wall of the stomach in all cases in their series, inflation of the stomach before the insertion of gastrostomy tube resulted in anterior rotation of the greater curvature of the stomach, moving the intestines anterior to the stomach. As a result, the needle passed through the intestine before entering the posterior wall of the stomach. Karhadkar et al. [10] reported that there are no methods that can completely prevent fistulas from developing after PEG.

At our hospital, transillumination and finger identification of the proposed tube insertion site for endoscopic recognition are routinely performed before the skin is punctured. In the present case, PEG was performed uneventfully in the usual manner and a CT scan showed that the PEG site was located in the anterior wall of the stomach. Therefore it is unlikely that rotation of the stomach caused by inflation during the procedure was responsible for the patient’s fistula. In addition, the patient had not undergone any previous abdominal surgery, did not exhibit any spinal deformities, and was bedridden. We could not definitively determine whether the jejunum had been elevated up to the level of the anterior abdominal wall during the procedure. However, the jejunum was the right of the gastrostomy button, so it is doubtful that it was elevated

<table>
<thead>
<tr>
<th>Authors (yrs)</th>
<th>Age (yrs)</th>
<th>Gender</th>
<th>Interval between PEG and onset</th>
<th>Clinical symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evans PM et al. [6] (1994)</td>
<td>22</td>
<td>Male</td>
<td>1 week</td>
<td>Increased discharge around the PEG site</td>
<td>Laparotomy and surgical gastrostomy</td>
</tr>
<tr>
<td>Kubiak R et al. [4] (1999)</td>
<td>12</td>
<td>Male</td>
<td>14 months</td>
<td>Leakage of a bilious fluid from around the tube</td>
<td>Laparotomy and surgical gastrostomy</td>
</tr>
<tr>
<td>De Vogelaere K et al. [9] (2000)</td>
<td>32</td>
<td>Male</td>
<td>4 months</td>
<td>Diarrhea</td>
<td>Laparotomy and surgical gastrostomy</td>
</tr>
<tr>
<td>Patwardhan N et al. [10] (2000)</td>
<td>5</td>
<td>Male</td>
<td>2 days</td>
<td>Intestinal obstruction</td>
<td>Laparotomy and surgical gastrostomy</td>
</tr>
<tr>
<td>Karhadkar AS et al. [10] (2006)</td>
<td>81</td>
<td>Male</td>
<td>12 months</td>
<td>Chronic diarrhea after tube replacement</td>
<td>Removal of tube and fluoroscopic percutaneous gastrostomy</td>
</tr>
<tr>
<td>Our case</td>
<td>85</td>
<td>Male</td>
<td>9 months</td>
<td>Increased peristomal discharge</td>
<td>Removal of gastrostomy button and PEG</td>
</tr>
</tbody>
</table>
the amount of drainage fluid was so low that the gauze
our case, the fistula originated from the jejunum, but
reasonable period of conservative management [11]. In
fistulas. Patients with these unfavorable predictive fac-
quality evidence. A previous report suggested that the
suggested although none of them are supported by high
adhesion in the peristomal space between the abdominal
Based on our experience, we consider it necessary to
Adhesion in the peristomal space between the
Entercutaneous fistulas are an intractable complica-
to the level of the stomach and became fixed between
the stomach and abdominal wall during the procedure.
If the jejunum had been trapped between the stomach
and the abdominal wall during the procedure, complica-
tions such as intestinal obstruction or perforation
likely have occurred.
Moreover, the period between the PEG and the
detection of the fistula was nine months, and the
case’s clinical course was otherwise uneventful.
Therefore, we consider the fistula to have formed gradu-
ally. One possible explanation for the patient’s fistula
was that following the PEG, the jejunum adhered to
the tube insertion site between the stomach and anterior
abdominal wall because of inflammation associated
with the PEG procedure and become interposed there.
Continuous mechanical stimulation then led to gradual
erosion, and the jejunal wall became connected to the
gastrocutaneous fistula. However, we cannot com-
pletely eliminate the possibility of jejunal wall fixation
during the PEG procedure, as in the report by De
Vogelaere et al. [9], under the lack of postoperative
imaging evaluation.

In conclusion, we reported a case in which a gastro-
jejunocutaneous fistula (an extremely rare complica-
tion) developed after PEG. Particular attention should
be paid to abnormal discharges around PEG sites, even
if adequate nutritional support is being supplied via the
gastrostomy tube.

References
1. Gauderer MWL, Ponsky JL and Izant RJ Jr: Gastrostomy without
laparotomy: a percutaneous endoscopic technique. J Paediatr
2. Löser C, Aschl G, Hébuterne X, Mathus-Vliegen EMH, Muscaritoli
M, Niv Y, Rollins H, Singer P and Skelly RH: ESPEN guidelines
on artificial enteral nutrition—percutaneous endoscopic gastrostomy
3. Rahnemai-Azar AA, Rahnemaiazar AA, Naghshizadian R, Kurtz A
and Farkas DT: Percutaneous endoscopic gastrostomy: indications,
technique, complications and management. World J Gastroenterol
4. Kubiak R, Wilcox DT and Spitz L: Gastrojejunal fistula after inser-
tion of percutaneous endoscopic gastrostomy. J Pediatr Surg
5. Patwardhan N, McHugh K, Drake D and Spitz L: Gastroenteric
fistula complicating percutaneous endoscopic gastrostomy. J
6. Magó H, Chen CL, Wesson DE and Filler RM: Incisionless gas-
5: 66–69.
7. Bui HD, Dang CV, Schlater T and Nghiem CH: A new complica-
tion of percutaneous endoscopic gastrostomy. Am J Gastroenterol
8. Evans PM and Serpell JW: Small bowel fistula: a complication of
percutaneous endoscopic gastrostomy insertion. Aust NZ J Surg
Gastroileocutaneous fistula: an unusual complication of percutane-
10. Karhadkar AS, Schwartz HJ and Dutta SK: Jejunocutaneous fis-
tula manifesting as chronic diarrhea after PEG tube replacement.
11. Martínez JL, Luque-de-León E, Mier J, Blanco-Benavides R and
Robledo F: Systematic management of postoperative enterocuta-
32: 436–443.
12. Davis KG and Johnson EK: Controversies in the care of the