



Petersen's Hernia after Subtotal Gastrectomy with Billroth II Gastrojejunostomy for Gastric Cancer: A Specific CT Finding

위암으로 Billroth II 위공장문합술을 통한 위아전절제술을 받고 난 후 발생한 Petersen 탈장: 특징적인 CT 소견

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Petersen's hernia is a rare internal hernia occurring after any type of gastrojejunal anastomosis. This type of internal hernia after laparoscopic gastrectomy with Roux-en-Y reconstruction for obesity treatment has been reported frequently. However, reports about Petersen's hernia after gastrectomy with Billroth II gastrojejunostomy for gastric cancer are relatively rare. To diagnose internal hernia, whirl sign has been reported to be a sensitive predictor of internal hernia. However, it is hard to diagnose a specific type of internal hernia. We report a case of Petersen's hernia after radical subtotal gastrectomy with Billroth II gastrojejunostomy for gastric cancer with an unreported specific computed tomography finding that suggests Petersen's hernia.

Index terms

Postoperative Hernia
Computed Tomography, X-Ray
Gastroenterostomy
Gastric Cancer

INTRODUCTION

Petersen's hernia was first described in 1900 by German surgeon, Dr. Walther Petersen. It is a specific type of internal hernia in which the small bowel moves into a potential space bounded by the caudal surface of the transverse mesocolon, the retroperitoneum and the mesentery of the gastrojejunostomy's limb (1). This type of internal hernia after laparoscopic gastrectomy with Roux-en-Y reconstruction for the treatment of obesity have been reported frequently (2, 3). However, reports about Petersen's hernia after gastrectomy with Billroth II gastrojejunostomy for gastric cancer are a few.

We report a case of Petersen's hernia after radical subtotal gastrectomy with Billroth II gastrojejunostomy through antecolic route for gastric cancer and demonstrate an unreported specific

computed tomography (CT) finding as a predictor of Petersen's hernia.

CASE REPORT

A 37-year-old woman presented with intermittent abdominal pain. She had undergone a robot-assisted radical subtotal gastrectomy with Billroth II gastrojejunostomy for advanced gastric cancer 8 months prior to her presentation. After undergoing gastrectomy, she was followed up with outpatient visits and received XELOX for 6 months. She did not have any other noteworthy symptoms and her physical examination results were also unremarkable. Laboratory investigations revealed nonspecific findings (C-reactive protein < 0.3 mg/L, white blood cell 6240/ μ L). Abdominal contrast-enhanced CT images showed

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the whirl sign, which indicates mesenteric vessel rotation, with mesenteric fat haziness (Fig. 1A, arrow). On a coronal image, the vessels showed engorgement (Fig. 1B, arrow) and the small bowel showed diffuse dilatation without evidence of strangulation (Fig. 1B, arrowheads). Furthermore, the interposed small bowel appeared (Fig. 1C, asterisk) between the transverse colon (Fig. 1C, arrowheads) and the afferent limb (Fig. 1C, arrow).

A diagnostic laparoscopy was performed, and revealed internal herniation of the efferent limb (Fig. 1D, arrow) through the Petersen defect, a space between the transverse mesocolon (Fig. 1D, E, asterisks) and the afferent limb (Fig. 1D, E, arrowheads), confirming the diagnosis of Petersen's hernia. A dilated small

bowel loop was observed without any sign of strangulation. The herniated small bowel was successfully reduced and the Petersen defect was closed by running absorbable sutures (Fig. 1E). The patient was followed up and no recurrence of intestinal obstruction was observed thereafter.

DISCUSSION

Petersen's hernia is a rare specific type of internal hernia in which the small bowel moves into a potential space bounded by the caudal surface of the transverse mesocolon, the retroperitoneum and the mesentery of the gastrojejunostomy's limb (1).

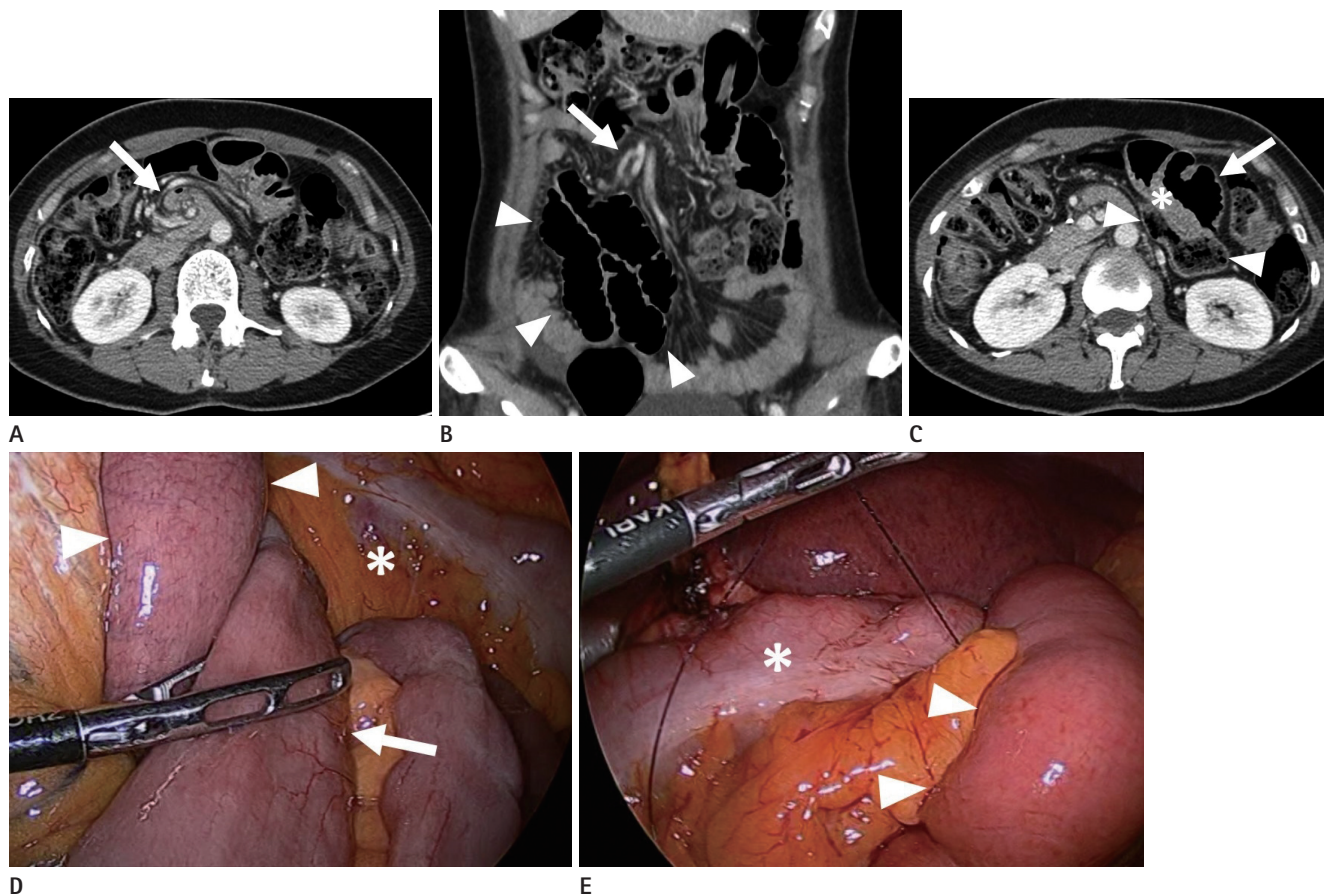


Fig. 1. Petersen's hernia in a 37-year-old woman.

A. Abdominal contrast enhanced CT showing whirl sign which indicates mesenteric vessel rotation and mesenteric fat haziness (arrow).

B. Abdominal contrast enhanced CT coronal image showing engorged vessels (arrow) and small bowel with diffuse dilatation without evidence of strangulation (arrowheads).

C. Abdominal contrast enhanced CT showing small bowel (asterisk) interposed between the transverse colon (arrowheads) and the afferent limb (arrow) like a sandwich.

D. A diagnostic laparoscopy showing internal herniation of the efferent limb (arrow) through the Petersen defect, a space between the transverse mesocolon (asterisk) and the afferent limb (arrowheads).

E. The herniated small bowel was successfully reduced and the Petersen defect between the transverse mesocolon (asterisk) and the afferent limb (arrowheads) was closed using absorbable suture.

CT = computed tomography

This type of internal hernia usually occurs within 1 year after bariatric surgery or (subtotal) gastrectomy performed to treat cancer, although it can develop several years after surgery (2). Internal hernias more frequently develop after laparoscopic surgery than laparotomy. This might be because more adhesion occurs after laparotomy which can reduce the mobility of the small bowel, and this in turn, prevents the internal herniation of the small bowel (2, 3). Loss of body weight and abdominal fat after gastrectomy which may widen potential spaces is another predisposing factor (3). Closure of all the mesenteric defects with running non-absorbable sutures can reduce the risk of an internal hernia developing after gastrectomy (2). Petersen's hernia can lead to the small intestinal obstruction and necrosis of the small bowel necessitating intestinal resection. When Petersen's hernia is diagnosed, the herniated intestinal loop should be reduced with the closure of all the mesenteric defect (2, 4-6).

The diagnosis of internal hernia including Petersen's hernia is challenging due to nonspecific clinical symptoms, laboratory findings and radiological findings (2, 3). The most common clinical symptoms are abdominal pain, nausea and vomiting, and these might be transient and self-resolving (2, 3). On CT, rotation of the mesenteric vessels, mesenteric fat haziness, intestinal distention in the upper abdomen, and herniated intestinal loop above the gastric level can be seen (7). The whirl sign has been reported to be the most sensitive single predictor of internal hernia (3, 7). However, even if these aforementioned signs are present on CT, it is hard to diagnose a specific type of internal hernia. In this case report, we demonstrate a specific CT finding, which is an interposed small bowel between the transverse colon and the gastrojejunostomy's limb as a predictor

of Petersen's hernia. It is a reasonable finding considering that Petersen's hernia is an internal hernia through a space between the transverse mesocolon and the gastrojejunostomy's limb.

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위암으로 Billroth II 위공장문합술을 통한 위아전절제술을 받고 난 후 발생한 Petersen 탈장: 특징적인 CT 소견

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Petersen 탈장은 위공장문합술 후에 드물게 발생하는 내탈장이다. 비만의 치료를 위해 Roux-en-Y 위우회술을 시행한 후에 발생한 Petersen 탈장은 상대적으로 빈번하게 보고되었으나, 위암으로 Billroth II 위공장문합술을 통한 위아전절제술을 받고 난 후에 발생한 경우는 거의 보고되지 않았다. 컴퓨터단층촬영에서 whirl sign이 내탈장을 진단할 수 있는 가장 민감한 소견으로 보고되어 있다. 그러나 이러한 소견이 보이더라도, 구체적인 내탈장 타입을 진단하는 것은 어려운 경우가 많다. 저자들은 위암으로 Billroth II 위공장문합술을 통한 위아전절제술을 받고 난 후에 발생한 Petersen 탈장을 보고하며, 내탈장 중에서도 Petersen 탈장을 나타내는 이전에 보고되지 않았던 특징적인 영상소견을 보고한다.

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