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Recurrent vomiting after pancreaticoduodenectomy with evolving perianastomotic changes and position-dependent gastrojejunal passage: a case report

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Case Report

Keywords: pancreaticoduodenectomy, delayed gastric emptying, surgical drain, intra-abdominal abscess, positional fluoroscopy, case report

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Recurrent vomiting after pancreaticoduodenectomy with evolving perianastomotic changes and position-dependent gastrojejunal passage: a case report

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Abstract

Background: Recurrent vomiting after pancreaticoduodenectomy may be associated with changing anatomical relationships around the gastrojejunostomy. This case illustrates how serial CT and positional fluoroscopy can help assess postoperative oral intake intolerance.

Case presentation: A 75-year-old woman underwent pancreaticoduodenectomy for ampullary adenocarcinoma. A replaced right hepatic artery arising from the superior mesenteric artery influenced drain placement, including placement of a drain posterior to the gastrojejunostomy. Vomiting began

after liquid intake on postoperative day (POD) 7. Review of CT suggested local compression of the anastomosis by the drain. Drain removal on POD 9 was followed by improved tolerance of liquids. Vomiting recurred on POD 13, when CT showed an approximately 5 × 4 cm collection anterior to the gastrojejunostomy. CT-guided aspiration yielded pus, and a drainage catheter was placed. Vomiting persisted at three to four episodes daily in the early period after drainage, decreasing to one to two episodes daily approximately four days later. The patient subsequently tolerated a semiliquid diet, although larger meals provoked symptoms. Upper gastrointestinal fluoroscopy showed slow passage across the anastomosis in the supine and upright positions, with improved passage in the prone position, consistent with symptomatic relief. She tolerated a semiliquid diet without vomiting at discharge on POD 36 and soft solid food without vomiting at follow-up on POD 57.

Conclusions: Serial CT, clinical responses to intervention, and positional fluoroscopy provided complementary evidence of possible local mechanical contributors to recurrent vomiting. Reassessment of perianastomotic anatomy may help explain persistent or recurrent oral intake intolerance during recovery.

Keywords: pancreaticoduodenectomy; delayed gastric emptying; surgical drain; intra-abdominal abscess; positional fluoroscopy; case report

Background

Recurrent vomiting after pancreaticoduodenectomy delays oral feeding and nutritional recovery. The International Study Group of Pancreatic Surgery (ISGPS) definition of delayed gastric emptying (DGE) incorporates nasogastric tube requirements, the time to tolerance of solid food, and the clinical consequences of impaired emptying. It also requires confirmation of anastomotic patency and exclusion of mechanical obstruction [1]. Evaluation of postoperative feeding difficulties therefore

requires attention to both the clinical course and possible anatomical causes of impaired gastrojejunal passage.

Intra-abdominal complications are associated with postoperative DGE. In a series of 1,170 patients undergoing pancreaticoduodenectomy, Marchegiani et al. identified 188 patients with DGE, of whom 71.8% had secondary DGE according to the study definition. Secondary DGE was associated with prolonged recovery and nutritional support requirements [2]. Kunstman et al. also reported associations between DGE, intra-abdominal abscess, and pancreatic fistula [3].

We report a patient whose tolerance of oral intake improved after removal of a drain posterior to the gastrojejunostomy, deteriorated in association with an anterior perianastomotic abscess, and partially recovered after percutaneous drainage. Subsequent fluoroscopy demonstrated position-dependent passage across the anastomosis. These findings illustrate the value of reassessing local anatomy when symptoms recur or recovery remains incomplete.

Case presentation

The clinical timeline is summarized in Figure 1. A CARE reporting checklist is provided as Additional file 1.

Presentation and surgical reconstruction

A 75-year-old woman presented with a one-week history of right upper quadrant pain and a three-day history of dark urine, accompanied by jaundice. Her abdomen was soft, with mild right upper quadrant tenderness, no rebound tenderness, and normal bowel sounds. She had no nausea, vomiting, or abdominal distension before admission and no history of diabetes mellitus. Her medical history included radiofrequency ablation for an arrhythmia. Laboratory testing showed a total bilirubin concentration of 125.4 μmol/L, direct bilirubin of 85.5 μmol/L, and carbohydrate antigen 19-9 (CA19-9) of 44.37 U/mL. Contrast-enhanced computed tomography (CT) and magnetic resonance imaging

(MRI) showed a mass in the pancreatic head–uncinate region, with distal common bile duct narrowing and upstream biliary dilatation.

The patient underwent pancreaticoduodenectomy with adhesiolysis. The procedure began laparoscopically and was converted to an open approach because of subcutaneous emphysema. Resection included a substantial distal gastric resection without pylorus preservation. Reconstruction comprised pancreaticojejunostomy, hepaticojejunostomy, gastrojejunostomy, and a Braun jejunojejunostomy. A replaced right hepatic artery arising from the superior mesenteric artery was identified intraoperatively, and its course prompted modification of the planned drain positions. Three drains, designated D1, D2, and D3 in this report, were placed posterior to the gastrojejunostomy, hepaticojejunostomy, and pancreaticojejunostomy, respectively. A jejunal feeding tube was placed in the efferent limb. The reconstruction and drain arrangement are illustrated in Additional file 2 (Figure S1). The arterial variant is illustrated in the CT image sequence provided as Additional file 3.

Histopathological examination demonstrated ampullary adenocarcinoma of pancreatobiliary type, measuring 2.8 × 2.3 × 1.5 cm, with perineural invasion. The resection margins were reported as negative, and all 14 examined lymph nodes were free of metastasis. The pathological stage was recorded as pT3bN0Mx.

Early vomiting and improvement after drain removal

Postoperative care included antimicrobial treatment, acid suppression, fluid replacement, and nutritional support. The nasogastric tube was removed on postoperative day (POD) 6 and was not reinserted. Vomiting began after the introduction of liquids on POD 7. The episodes were not followed by prominent persistent nausea or abdominal distension. Metoclopramide and dolasetron were administered during the symptomatic period.

Review of the abdominal CT obtained on POD 4 showed D1 posterior to the gastrojejunostomy, with findings suggestive of local compression at the anastomosis and no substantial collection around the drain (Figure 2A–C). The drain was considered a possible contributor to impaired passage and was removed on POD 9. Tolerance of liquids subsequently improved, with no appreciable postprandial vomiting on POD 10–12. D2 was removed on POD 11.

Recurrent vomiting and an anterior perianastomotic abscess

On POD 13, vomiting after liquid intake recurred and increased in frequency. Contrast-enhanced CT demonstrated an approximately 5 × 4 cm encapsulated collection anterior to the gastrojejunostomy, with thickening of the adjacent anastomotic region and gastric remnant wall. There was no marked gastric dilatation (Figure 2D,E).

CT-guided drainage was performed under local anesthesia on the same day. Approximately 10 mL of pus was aspirated through an 18-gauge needle and sent for culture. A pigtail catheter, designated D4, was then placed. The culture grew *Candida albicans*. Drain output was approximately 100 mL/day for the first three days and subsequently decreased to approximately 10–20 mL/day.

Liquid intake continued after drainage. Vomiting initially persisted at three to four episodes daily and decreased to one to two episodes daily approximately four days later. The diet was subsequently advanced to semiliquid food, although larger meals continued to provoke nausea and vomiting. The jejunal feeding tube was removed on POD 16, and D3 was removed on POD 19. A clinical summary on POD 22 continued to document postprandial vomiting.

Positional fluoroscopy and subsequent recovery

Upper gastrointestinal fluoroscopy using iohexol was performed on POD 25. Contrast passed slowly through the gastrojejunostomy in the upright (standing; Figure 3A) and supine (Figure 3B) positions but passed readily in the prone position (Figure 3C). No obvious anastomotic stenosis or filling defect

was identified. The patient also reported symptomatic relief in the prone position. She was advised to adopt a prone or forward-leaning position after meals, and a digestive enzyme preparation was added to her treatment.

Follow-up CT on POD 28 showed near-complete resolution of the perianastomotic abscess, with persistent thickening of the anastomotic region and adjacent gastric wall (Figure 2F). D4 was removed on POD 32. At discharge on POD 36, the patient tolerated a semiliquid diet without vomiting. At follow-up on POD 57, she tolerated soft solid food without vomiting or other reported gastrointestinal symptoms.

Figure 1. Clinical course after pancreaticoduodenectomy.



POD = postoperative day; PD = pancreaticoduodenectomy; GJ = gastrojejunostomy; NG = nasogastric.

Milestones are chronological, not proportional to time. Only documented observations are shown.

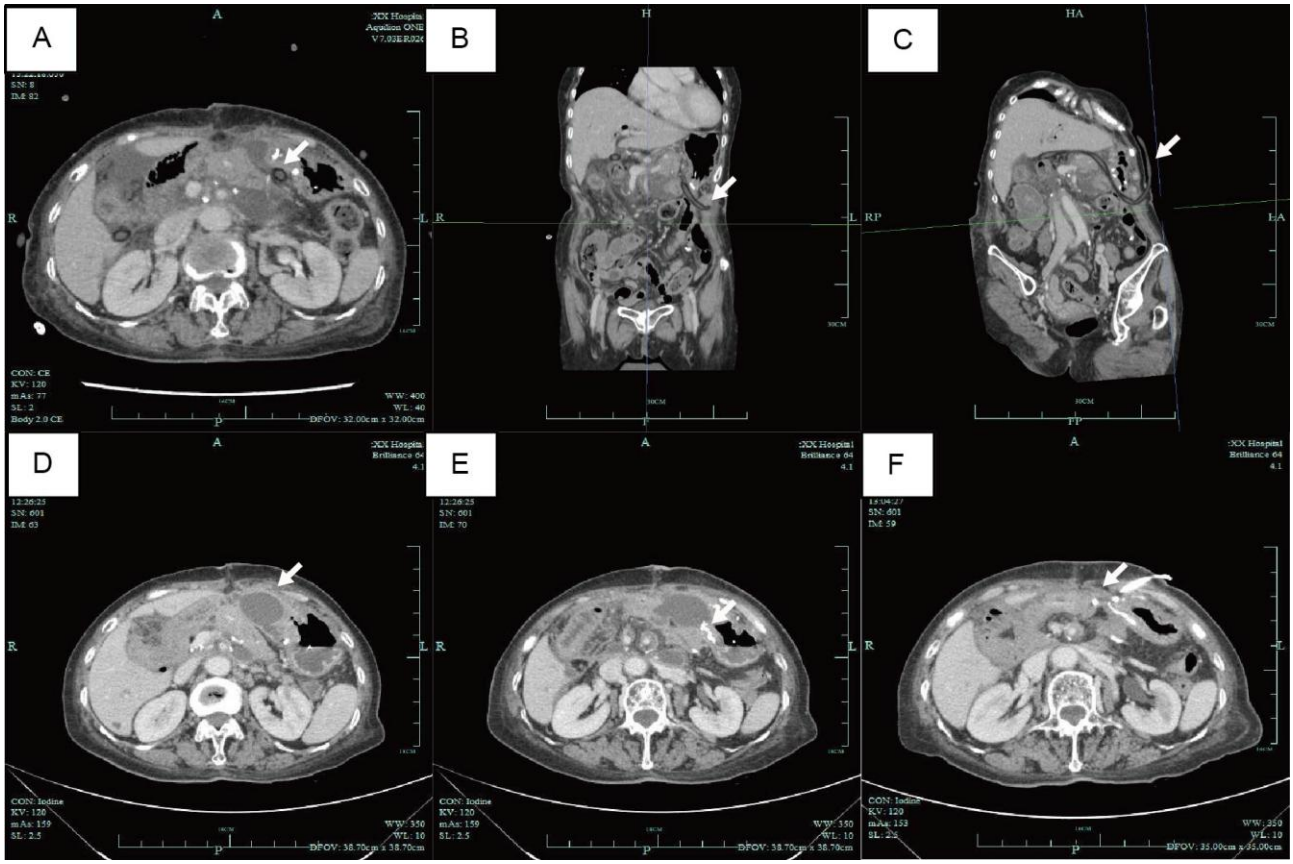


Figure 2. Serial CT findings of drain-related gastrojejunal compression and a subsequent perianastomotic abscess. (A–C) CT on postoperative day (POD) 4 shows the surgical drain posterior to the gastrojejunostomy, with local anastomotic compression. (A) Axial image. (B) Coronal reformatted image. (C) Oblique coronal reformatted image obtained by adjusting the reconstruction plane to display the full course of the drain and its relationship to the gastrojejunostomy. White arrows in A–C indicate the drain. (D,E) Axial CT images on POD 13 show an abscess anterior to the gastrojejunostomy and its compressive relationship with the anastomotic region. The white arrow in D indicates the abscess, whereas the white arrow in E indicates the gastrojejunostomy. (F) Follow-up axial CT on POD 28, at a level comparable to those in D and E, shows near-complete resolution of the abscess after percutaneous drainage. The white arrow indicates the site of the previous abscess.

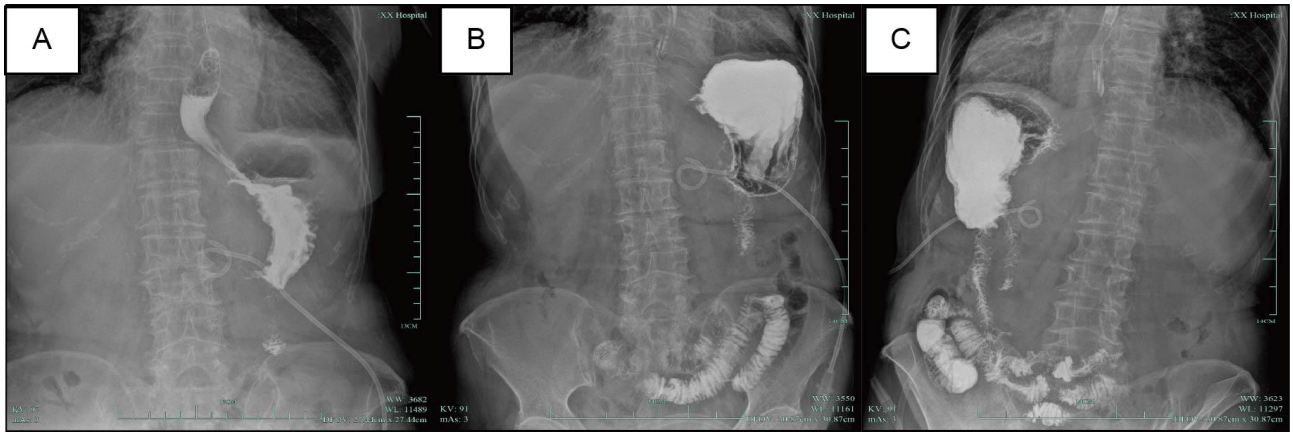


Figure 3. Position-dependent gastrojejunal passage on upper gastrointestinal fluoroscopy. Representative images obtained on postoperative day 25 in the (A) upright (standing), (B) supine, and (C) prone positions. During fluoroscopy, contrast passage through the gastrojejunostomy was slow in the upright and supine positions and improved in the prone position. Panels are arranged by position and do not indicate the order of acquisition.

Discussion and Conclusions

This patient experienced an evolving pattern of oral intake intolerance after pancreaticoduodenectomy. Early CT suggested compression of the gastrojejunostomy by a posterior surgical drain, and removal on POD 9 was followed by improved tolerance of liquids. Vomiting recurred with an anterior perianastomotic abscess on POD 13 and decreased after percutaneous drainage, allowing progression to semiliquid food. Persistent intolerance of larger meals subsequently prompted fluoroscopy, which demonstrated slow passage in the standing and supine positions and improved passage in the prone position, corresponding to symptomatic relief. These successive changes illustrate the importance of following both the local anatomy and the clinical response throughout recovery.

The central observation was that the pattern of impaired gastrojejunal passage changed during the postoperative course. Improvement after drain removal was followed by an abscess-associated recurrence, while incomplete recovery after drainage led to recognition of position-dependent passage.

The ISGPS definition of delayed gastric emptying (DGE) requires confirmation of anastomotic patency and exclusion of mechanical obstruction [1]. Healy et al. further showed that postoperative events unrelated to primary gastric dysfunction can influence classification based on nasogastric tube use and dietary recovery [4]. In this setting, the diagnosis should be reconsidered whenever the clinical pattern changes. Findings that adequately explain an earlier episode may no longer account for recurrent vomiting or stalled dietary progression.

Drain-related intestinal obstruction is an uncommon complication described in individual reports. Bogiatzopoulos et al. documented ileal compression by a pelvic drain against the pelvic sidewall, confirmed at reoperation [5]. Nguyen and Pham reported small bowel obstruction after colectomy that resolved following drain removal [6]. In our patient, the relevant relationship was between the posterior drain and a newly constructed gastrojejunostomy: CT suggested local compression, and drain removal was followed by several days of improved liquid tolerance. A replaced right hepatic artery arising from the superior mesenteric artery provided an additional operative consideration because its course prompted modification of drain placement. El Amrani et al. emphasized the importance of recognizing right hepatic arterial variants during pancreaticoduodenectomy, particularly for arterial preservation and oncological dissection [7]. This case highlights a related practical consideration: when vascular anatomy necessitates a modified drain route, its relationship to the reconstructed stomach and jejunum also requires attention.

Previous reports of obstruction after pancreaticoduodenectomy demonstrate the clinical importance of reconstruction geometry. Yang et al. described compression of a jejunal loop by the superior mesenteric vessels, causing obstruction and pancreatic fistula, with the mechanism confirmed at reoperation [8]. Wu et al. reported efferent-loop obstruction predominantly caused by fixed angulation at the gastrojejunostomy and treated by endoscopic correction of the local geometry [9]. These reports describe a specific obstructing structure or configuration. Our case is distinctive because the findings

around the same anastomosis evolved over time, from suspected posterior drain-related compression to an anterior collection and subsequently to position-dependent passage. This sequence emphasizes that the relationship between the gastrojejunostomy and its surroundings can remain clinically relevant at successive stages of recovery.

The abscess-associated recurrence is consistent with evidence linking intra-abdominal complications to postoperative DGE. In the series reported by Marchegiani et al., 188 of 1,170 patients developed DGE, and 71.8% of these cases were classified as secondary DGE [2]. Kunstman et al. identified postoperative abscess and pancreatic fistula as independent risk factors for DGE [3]. In our patient, the anterior collection and adjacent wall thickening provided an anatomical correlate for recurrent vomiting. Percutaneous drainage, an established approach to postoperative collections after pancreaticoduodenectomy [10], yielded pus and was followed by reduced vomiting and improved dietary tolerance. Persistent intolerance of larger meals after drainage prompted fluoroscopic assessment of gastrojejunal passage on POD 25. Follow-up CT on POD 28 subsequently showed near-complete resolution of the abscess, with persistent wall thickening (Figure 2F).

Positional fluoroscopy complemented CT by demonstrating how passage changed under different conditions. The standing and supine views showed slow transit across the gastrojejunostomy (Figure 3A,B), whereas prone positioning facilitated passage (Figure 3C), without an obvious anastomotic stenosis or filling defect. In the presence of an anterior collection and adjacent wall thickening, posture may have altered the relative orientation or external loading of the gastric remnant and jejunal limb. The concordant improvement in contrast passage and symptoms made the positional finding clinically informative and provided a basis for individualized advice during dietary recovery. In this case, assessment in different positions helped explain persistent feeding difficulty after treatment of the collection.

The principal clinical lesson is that recurrent vomiting after pancreaticoduodenectomy requires renewed diagnostic assessment as the postoperative anatomy evolves. Each change in this patient's course redirected the investigation: early vomiting prompted review of the drain–anastomosis relationship, recurrence after initial improvement led to identification of an anterior abscess, and incomplete recovery after drainage prompted evaluation of position-dependent passage. Serial CT defined the surrounding structural changes, while fluoroscopy assessed transit through the reconstructed outlet. Together, these findings support a practical approach: reassess the current anatomical basis of symptoms whenever vomiting recurs or dietary progression stalls, and direct management toward the findings at that stage. The patient's progression to a semiliquid diet without vomiting at discharge and soft solid food at follow-up provided a meaningful functional outcome.

In conclusion, this case highlights the evolving nature of gastrojejunal passage impairment after pancreaticoduodenectomy and the clinical value of repeated anatomical assessment. Improvement after drain removal, abscess-associated recurrence, and subsequent positional relief illustrate how similar symptoms can accompany different local findings over time. The central message is to reassess both the anastomosis and its surroundings when symptoms recur, integrate structural and dynamic imaging, and adapt management to the current stage of recovery.

Additional files

Additional file 1. CARE reporting checklist. Format: DOCX. Item-by-item mapping to the manuscript sections, with unreported or partially reported items identified.

Additional file 2. Figure S1: reconstruction and drain placement. Single-panel anatomical schematic showing the principal anastomoses, the replaced right hepatic artery, and drains D1–D3. The Braun jejunojejunostomy is omitted to emphasize these anatomical relationships. The schematic is not to scale.

Additional file 3. CT image sequence illustrating the replaced right hepatic artery. Format: de-identified animated GIF (57 frames). Author-supplied preoperative axial CT sequence for illustration of the reported right hepatic arterial variant. Identifying text overlays were masked without changing the remaining image pixels or frame timing.

List of abbreviations

CA19-9: carbohydrate antigen 19-9; CT: computed tomography; DGE: delayed gastric emptying; GJ: gastrojejunostomy; HJ: hepaticojejunostomy; ISGPS: International Study Group of Pancreatic Surgery; MRI: magnetic resonance imaging; PJ: pancreaticojejunostomy; POD: postoperative day; rRHA: replaced right hepatic artery; SMA: superior mesenteric artery.

Declarations

Ethics approval and consent to participate

Ethics approval was not required for this single-patient case report in accordance with the institutional policy of Shaoxing People's Hospital.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Availability of data and materials

The original contributions presented in this study are included in the article and its supplementary materials. Additional patient-level clinical information and imaging data are not publicly available to protect patient privacy. Further inquiries may be directed to the corresponding author.

Competing interests

The authors declare that they have no financial or non-financial competing interests.

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Authors' contributions

YH and HQ contributed equally to imaging interpretation, provision of resources, data curation, and manuscript review and editing, and share first authorship. DZ contributed to conceptualization, data curation, investigation, supervision, and manuscript review and editing. All authors have read and approved the final manuscript.

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Not applicable.

Use of artificial intelligence

OpenAI Codex was used to assist with literature organization, manuscript drafting based on author-provided clinical information and interpretations, English-language revision, reference checking, and document formatting. The authors are responsible for the clinical interpretation, verification of the cited sources, and the accuracy and integrity of the final manuscript.

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Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1CAREchecklist.docx
- Additionalfile2FigureS1.png
- Additionalfile3.gif