

Case Report

Not all post-Whipple hemorrhage is Whipple-related: inferior rectal artery aneurysm rupture masquerading as delayed bleeding after pancreatoduodenectomy

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ABSTRACT

Delayed haemorrhage following pancreatoduodenectomy is a rare but life-threatening complication that is usually attributed to peri-pancreatic vessel erosion or anastomotic bleeding. We describe an extraordinary case of massive lower gastrointestinal bleeding caused by rupture of an inferior rectal artery aneurysm in a patient who had undergone pylorus-resecting pancreatoduodenectomy for moderately differentiated ampullary adenocarcinoma. Despite successful endovascular embolization, persistent haemodynamic instability mandated surgical re-exploration. We highlight diagnostic challenges, the pivotal role of cross-sectional imaging and interventional radiology, and key principles for managing obscure postoperative haemorrhage. This case underscores a key diagnostic pitfall: not all delayed haemorrhage after pancreatoduodenectomy originates from the pancreatic bed. Clinicians should deliberately search for extra-pancreatic sources—extending imaging to the pelvis and engaging interventional radiology early—to avoid misdirected interventions and delays in haemostasis. To our knowledge, this is the first report linking an inferior rectal artery aneurysm to post-Whipple bleeding. Awareness of distant vascular sources and a structured multidisciplinary approach can improve outcomes when conventional causes are excluded.

Keywords: Delayed hemorrhage, Whipples surgery, Post pancreatectomy hemorrhage, Aneurysmal bleed

INTRODUCTION

Pancreatoduodenectomy (Whipple procedure) remains the only curative option for periampullary malignancies, yet it is associated with a morbidity rate approaching 50%.^{1,2} Postoperative haemorrhage occurs in 2–7% of cases and carries a mortality of up to 40%.^{3,4} Early bleeding (≤ 24 h) is typically technical, whereas delayed bleeding (>24 h) is most often related to pseudo-aneurysm formation, pancreatic fistula-related erosion of the gastroduodenal or hepatic artery stump, or marginal ulceration at the gastrojejunostomy.^{5,6} Bleeding originating below the pelvic brim after Whipple surgery

is virtually unheard of. Inferior rectal (hemorrhoidal) artery aneurysms are themselves vanishingly rare, with <20 cases described, usually in association with trauma, pelvic infection or systemic vasculitis.⁷

In practice, a powerful anchoring bias leads teams to presume that all delayed bleeding is peri-pancreatic (e.g., GDA stump/pseudo-aneurysm or anastomotic sites). This report cautions that catastrophic haemorrhage may arise from anatomically remote vasculature and will be missed unless the diagnostic field and differential are deliberately broadened beyond the pancreatic bed.

CASE REPORT

A 53-year-old man with type 2 diabetes mellitus and no other comorbidities presented with progressive obstructive jaundice and weight loss. Magnetic-resonance cholangiopancreatography (MRCP) revealed a 2.8 cm periampullary mass with biliary obstruction. Endoscopic retrograde cholangiopancreatography (ERCP) achieved biliary drainage and biopsy confirmed moderately

differentiated adenocarcinoma of the ampulla. Following optimisation—including glycaemic control and cardiopulmonary evaluation—he underwent pylorus-resecting pancreatoduodenectomy with standard lymphadenectomy. Intra-operative blood loss was 300 ml, no vascular reconstruction was required, and the final resection was R0.

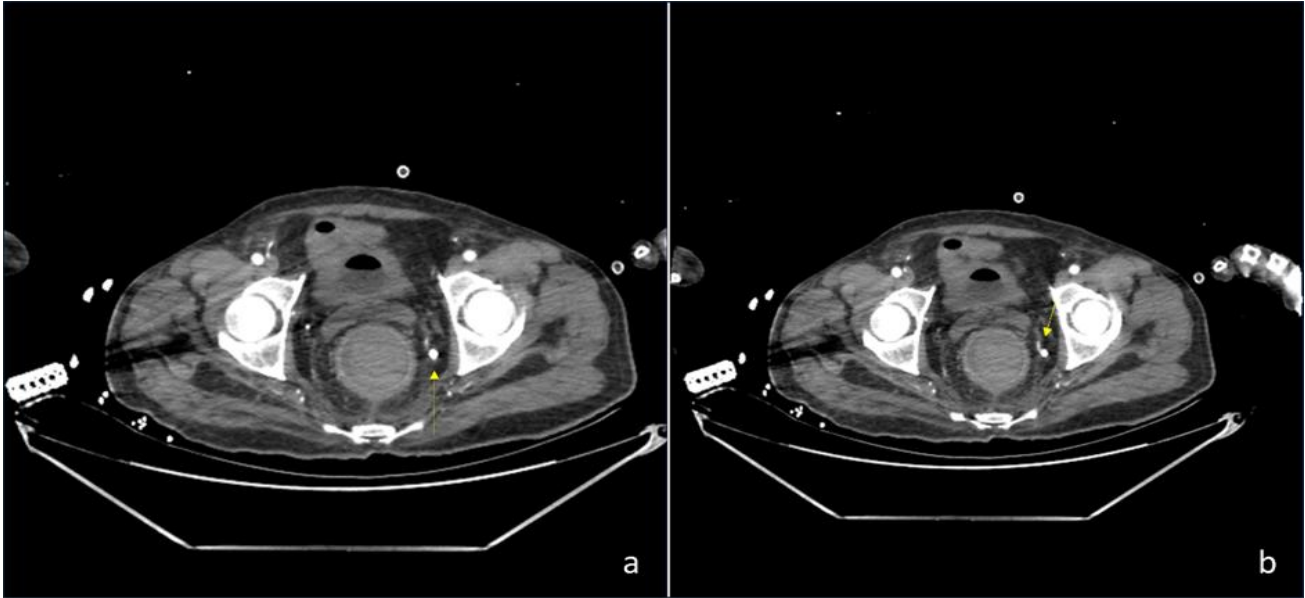


Figure 1: Contrast enhanced CT scan of abdomen pelvis which showed no evidence of bleed near surgical bed, instead showed: (a) bleeding aneurysm from the left inferior rectal artery and (b) active contrast extravasation from the same (marked by yellow arrows in both images).

Computed-tomography (CT) angiography of the chest, abdomen, and pelvis did not demonstrate active contrast extravasation from gastroduodenal or hepatic arteries, nor any intra-abdominal haematoma. A 1.5 cm hypodense lesion with faint peripheral enhancement was, however, noted posterior to the rectosigmoid junction, interpreted as a contained haematoma or thrombus-filled aneurysm (Figure 1). Urgent digital-subtraction angiography via the inferior mesenteric artery confirmed active extravasation from a fusiform aneurysm of the left inferior rectal branch of the internal pudendal artery. Super-selective micro-catheterisation followed by detachable coil embolization achieved immediate angiographic stasis. Given absent peri-pancreatic extravasation on CT angiography and active bleeding from a left inferior rectal branch on DSA, the working diagnosis shifted from 'post-Whipple bed bleed' to a remote pelvic source, prompting a management pathway outside the pancreatic field. Despite technical success, the patient remained haemodynamically labile over the next four hours, with falling haemoglobin and escalating vasopressor requirements.



Figure 2: Endoscopic image of the hepaticojejunostomy anastomotic site through upper GI endoscopy during simultaneous laparotomy. Reprinted from Balachandran RR, et al. Endoscopic visualization of hepaticojejunostomy via anastomotic jejunal limb: a unique perspective.

Given the possibility of concurrent intra-abdominal bleeding or failed embolization, decision was made for urgent re-exploration. At laparotomy the peritoneal cavity was pristine; both the pancreatic jejunostomy and hepaticojejunostomy were intact with no evidence of leak or haemorrhage. Intra-operative colonoscopy revealed erythematous rectal mucosa with patchy oozing but no spurting vessel. Proximal colon and small bowel were clear of blood. Concurrent upper-GI endoscopy up to the hepaticojejunostomy demonstrated only bilious contents without active bleed (Figure 2). No additional source was identified, abdominal drains were repositioned, and

the abdomen was closed. Post-re-exploration the patient was ventilated overnight and required low-dose norepinephrine for 12 hours. Drain amylase on POD 7 fell to 19 IU/L (right) and 23 IU/L (left); the right drain was removed. Enteral feeds were re-started on POD 7, advanced as tolerated, and both drains were removed by POD 12. He was mobilised without support, passed normal stools, and was discharged home in good condition on POD 20. Histopathology confirmed a pT2N0 moderately differentiated ampullary adenocarcinoma with 0/18 nodes involved.

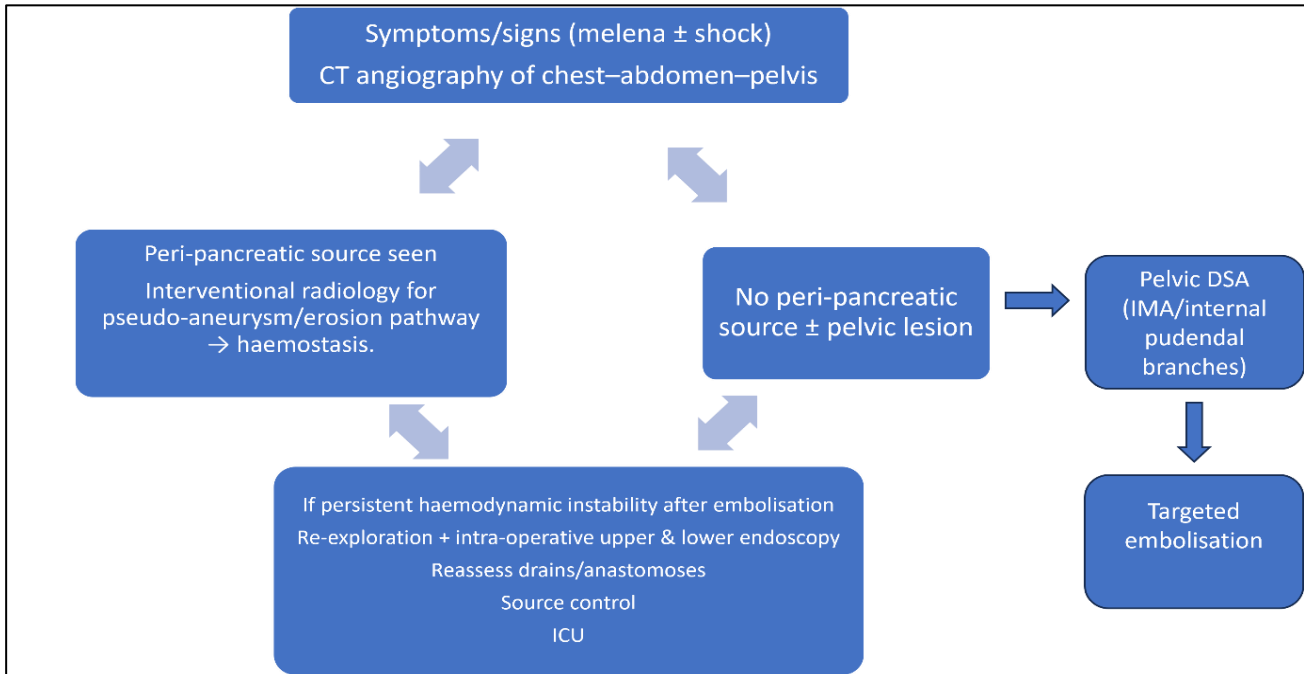


Figure 3: Algorithm for delayed post PD haemorrhage with lower GI features.

DISCUSSION

Avoiding anchoring in delayed post-pancreato-duodenectomy hemorrhage (DPDH), inferior rectal artery aneurysms represent <0.05 % of all visceral aneurysms. Proposed etiologies include trauma, pelvic sepsis, connective-tissue disorders, and iatrogenic injury during hemorrhoidectomy.⁷ None were present in our patient, raising the possibility of a pre-existing but asymptomatic aneurysm that ruptured under postoperative stress and altered hemodynamics. Portal hypertension has been implicated in hemorrhoidal plexus dilation, yet our patient exhibited no clinical or radiological evidence of portal hypertension. DDPH is categorized by the International Study Group of Pancreatic Surgery as bleeding occurring >24 h after surgery.⁸ DDPH demands urgent localization and control because mortality rises steeply with diagnostic delay. While CT angiography localizes >80 % of pseudo-aneurysms around the pancreatic bed, its sensitivity for intermittent or distal hemorrhage is lower.

Our patient's instability with negative upper-abdominal CTA prompted pelvic evaluation and diagnosis of an inferior rectal artery aneurysm rupture—illustrating how anchoring on presumed peri-pancreatic sources can delay definitive control.

When to suspect an extra-pancreatic (remote) source

The following bedside and imaging cues should broaden the search beyond the pancreatic bed:

Predominant lower-GI manifestation (melena/clots per rectum) early after PD.

No peri-pancreatic source on CTA despite hemodynamic instability.

Favorable drain biochemistry reducing likelihood of POPF-related erosion (e.g., POD-7 drain amylase 19–23 IU/l in this case).

Pelvic focus/lesion on cross-sectional imaging, or otherwise equivocal findings—extend the field to include the pelvis by default in unexplained shock.

Management principles: Endovascular therapy is the preferred first-line modality for visceral pseudo-aneurysms, offering hemostasis in $\approx 90\%$ of cases with minimal morbidity. However, persistent instability after technically successful embolization should trigger low-threshold surgical exploration to exclude missed sources, ongoing intraluminal loss, or compartmental effect from haematoma.⁹ Intra-operative endoscopy (upper and lower) complements exploration by surveying

anastomoses and bowel mucosa without additional enterotomies.

A systematic PubMed search using the terms "rectal artery aneurysm" and "post-pancreatoduodenectomy hemorrhage" yielded no previous reports of inferior rectal artery aneurysm rupture in the context of pancreatobiliary surgery. The unique anatomical remoteness underscores the broader principle that postoperative bleeding may stem from systemic or unrelated vascular pathology, particularly in the hyper-dynamic phase of recovery.

Table 1: Algorithm for evaluation of hemodynamic collapse with melena after PD.

Clinical decision box: do not anchor — evaluating haemodynamic collapse with melena after PD
If melena or clots per rectum \pm shock \rightarrow obtain CTA of chest–abdomen–pelvis (not abdomen alone).
If CTA is negative/equivocal around the pancreatic bed \rightarrow interrogate pelvic vasculature (IMA/internal pudendal branches) with directed DSA.
Engage interventional radiology early; if instability persists despite embolization \rightarrow urgent surgical exploration \pm intra-operative upper and lower endoscopy.
Reassess POPF likelihood (biochemistry/trends); low POPF reduces odds of peri-pancreatic erosion.

Table 2: Summary of the key learning points.

Summary of the key learning points
Avoid anchoring bias: not all delayed post-pancreatoduodenectomy hemorrhage is Whipple-related.
Always image the entire abdomen and pelvis when evaluating unexplained postoperative haemorrhage.
Interventional radiology is invaluable, yet persistent haemodynamic instability after embolization warrants prompt surgical exploration.
Inferior rectal artery aneurysm, though extremely rare, should be considered when lower GI bleeding occurs in the early postoperative period.
A multidisciplinary approach involving surgery, radiology, anaesthesia, and gastroenterology optimise outcomes.

CONCLUSION

Inferior rectal artery aneurysm rupture is an unrecognised cause of delayed haemorrhage after pancreatoduodenectomy. Our case reinforces the need for broad vascular assessment, early interventional radiology, and readiness for re-exploration when instability persists. Reporting such atypical presentations expands the differential for post-Whipple bleeding and may shorten time to diagnosis in future patients.

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