

Late Postduodenopancreatectomy Hemorrhage of Unusual Origin (Dorsal Pancreatic Artery): A Case Report

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DOI: [10.36347/sjmcr.2024.v12i07.023](https://doi.org/10.36347/sjmcr.2024.v12i07.023)

Received: 12.06.2024 | Accepted: 17.07.2024 | Published: 24.07.2024

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Abstract

Case Report

The late form of postpancreatectomy hemorrhage is suspected of a multifactorial pathogenesis, and presents a diagnostic and therapeutic challenge for practitioners, all the more so when it concerns an unusual origin, such as the dorsal pancreatic artery, of which the Anatomy is rich in variability. Diagnostic angiography or computed tomography have a higher sensitivity and CT angiography remains more informative. Transarterial embolization (TAE) appears to be associated with lower mortality compared to relaparotomy and endoscopy as first intervention for postpancreatectomy hemorrhage. But in case of bleeding from the dorsal pancreatic artery, embolization may be difficult due to the difficulty of its identification on angiography, especially during bleeding intervals, difficulties in superselection, and also due to the rich collateral circulation, which would increase the chances of technical problems and/or clinical failures. In this article we report the case of a 50-year-old patient treated for hemorrhagic shock following late surgery following a duodenopancreatectomy for adenocarcinoma of the head of the pancreas, due to a pseudoaneurysm of the dorsal pancreatic artery.

Keywords: Dorsal pancreatic artery; Postpancreatectomy hemorrhage; Transarterial embolization; Case report.

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INTRODUCTION

Postpancreatectomy hemorrhage (PPH), especially in its late form, remains a relatively rare complication with an average incidence of 5%. However, overall mortality remains high at 21%, despite progress in surgeon experience and perioperative management techniques [1, 2]. The mechanism is multifactorial as well as the hemorrhagic arteries can be the gastroduodenal artery, the splenic, hepatic or gastric arteries. The dorsal pancreatic artery (DPA) can also be the source of such hemorrhage, although this is much rarer [2, 5]. This rarity poses a dual-component challenge, diagnostic and therapeutic, particularly in the absence of a unified algorithm for the diagnosis and treatment of this entity of postoperative complications [4]. In this paper we report the case of late postpancreatectomy hemorrhage due to a pseudoaneurysm of the DPA in a 50-year-old patient.

CASE REPORT

50-year-old man, with no notable pathological history, initially consulted a gastroenterologist for

epigastralgia with weight loss, a CT scan revealed a tumor mass in the upper part of the head of the borderline pancreas measuring 27*21*24 mm contracting intimate relations with the portal trunk and the inferior vena cava and responsible for a moderate dilatation of the common hepatic duct and the intrahepatic bile ducts as well as a distension of the gallbladder, with hilar hepatic and peripancreatic lymphadenopathy. Without remote secondary localization at the thoracic and abdominal levels. The patient was referred for chemotherapy consisting of 06 sessions of Gemcitabine with a CT evaluation showing stability in the size of the tumor as well as vascular relationships. Subsequently, the patient underwent radiotherapy for 25 sessions (50 Gy) and then referred to our surgical center for a specialist opinion. At 08 weeks post-radio-chemotherapy a new CT scan was carried out then discussion of the case at the multidisciplinary digestive oncology meeting whose decision was to carry out oncological surgery given that the tumor became resectable without significant change in its size becoming 24 *19*26 mm.

After preanesthetic advice and preoperative preparation, the patient is operated on, benefiting from a

cephalic duodenopancreatectomy according to Whipple and reconstruction according to Child. We note a difficult dissection given the post-radiation fibrosis of the duodenopancreatic region, with intraoperative bleeding estimated at 200 mL without the need for transfusion and an operating time of 4h30min. the patient was transferred to intensive care for 48 hours postoperative monitoring then returned to the surgery department given the favorable evolution. The patient is discharged on POD7 after favorable evolution, notably negative Amylase and Lipase dosages in the drainage fluid on D5 and correct resumption of food. At the postoperative follow-up consultation on POD12, the patient is perfectly well and referred to oncology for adjuvant chemotherapy given that the anatomopathology and immunohistochemical studies are in favor of a pancreatic adenocarcinoma with healthy resection limits.

On POD16, the patient consulted the emergency room for an upper digestive hemorrhage made up of hematemesis and melena. Whose physical examination finds a conscious patient with signs of shock made up of mucocutaneous pallor, arterial hypotension at 70/50 mmHg, coldness of the extremities and profuse sweating. Hemoglobin was 6.1 g/dL. An abdominal CT angiography showed a spontaneously dense intra-jejunal hematoma and a saccular addition image seems to be at the expense of the DPA opposite the pancreatico-jejunal anastomosis area measuring 6.5 x 5.5 mm in diameter, probably related with a false aneurysm. A peripancreatic collection measuring 31 x 20 mm in diameter. Without abnormality of the gastro-jejunal, pancreatico-jejunal and hepatico-jejunal anastomosis (Figure 1).

Patient admitted to the discharge room for treatment consisting of vascular filling, oxygen therapy, placement of a central venous catheter, transfusion with 03 packed red blood cells and 04 units of fresh-frozen plasma, as well as the introduction of low dose norepinephrine and calcium gluconate. Then the patient was transferred to the arteriography room for emergency TAE. After access via the right femoral artery, catheterization and opacification of the common hepatic artery then the DPA reveals extravasation in projection of the pancreatic-jejunal anastomosis. Selective microcatheterization of the DPA allows embolization with a mixture of biological neck and Lipiodol at a proportion of 1:1. The control shows a total extinction of the DPA, with an accidental leak of the glue into the splenic artery. Superior mesenteric artery catheterization showing no extravasation (Figure 2).

Subsequently, the patient was transferred to the intensive care unit for treatment which mainly consisted of hemodynamic support and pain management. An ultrasound was performed 48 hours after TAE given the risk of splenic infarction returning normal.

Return to the surgical department after 72 hours, the monitoring of which was favorable without rebleeding or abdominal pain and hemoglobin at 10.1 g/dL, then the patient was discharged home on day 5 after embolization.

At 3 months, the patient is perfectly well without any further bleeding events.

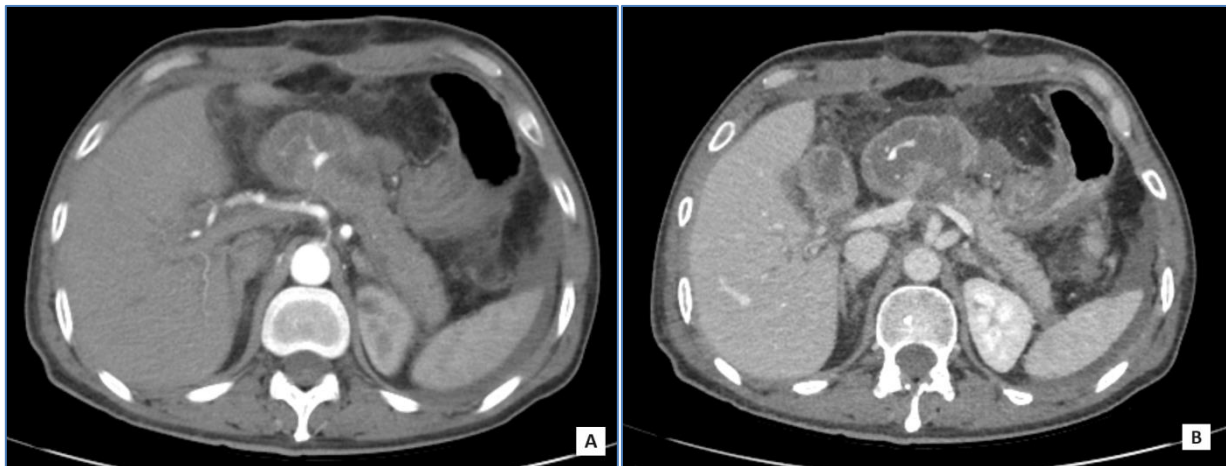


Figure 1: Abdominal CT angiography showing an addition image next to the pancreatico-jejunal anastomosis area, probably related to a pseudoaneurysm of the dorsal pancreatic artery (A), and late intrajejunal extravasation of contrast product (B)



Figure 2: Arteriography after selective microcatheterization of the dorsal pancreatic artery reveals extravasate projecting from the pancreatico-jejunal anastomosis (A). Control after embolization showing total extinction of the dorsal pancreatic artery, with accidental leakage of the glue into the splenic artery (B)

DISCUSSION

The DPA was first reported by Haller in 1745, who named it the “superior pancreatic artery” [6]. It is predominant which vascularizes the body and tail of the pancreas with the pancreatic branches of the splenic artery, the caudal pancreatic arteries and the transverse pancreatic artery [2, 6].

The DPA is present in 95.8% of cases. It came from the splenic artery in 37.6% of cases, from the common hepatic artery in 18.3% of cases, from the celiac trunk in 11.9% of cases and from the superior mesenteric artery in 23.9%. % of cases. Other rare origins were present in 2.77% of cases. Multiple dorsal pancreatic arteries were found in 1.7% of cases [6].

Current literature shows that postpancreatectomy hemorrhage is relatively rare, with an incidence that ranges from 3 to 30%, but associated with a mortality of 21%, making it the most fatal specific complication of pancreatectomy [1, 4]. This incidence is influenced not only by surgical factors, but also by anamnestic, histomorphological and postoperative factors. Generally, there are two forms of postpancreatectomy hemorrhage:

- Early PPH occurring within the first 24 hours postoperatively is often due to technical failure to ensure intraoperative hemostasis or perioperative disorders of the blood coagulation system, usually requiring repeat relaparotomy [2, 4].
- Delayed PPH occurs more than 24 hours after operation, the mechanism of which is more complex, which mainly results from vascular erosion correlated with pancreatic fistula, bile leak and infection [1, 2, 4].

This late form is the result of a multifactorial pathogenesis in which postoperative pancreatic fistula plays an important role. Whose technical characteristics of the operation have a direct impact on the incidence of

late postpancreatectomy hemorrhage. The “skeletonization” of the visceral vessels during lymphadenectomy as well as vascular ligations most likely lead to a weakening of the vascular wall. In cases of pancreatic and/or biliary fistula, the compromised vessel wall is in direct contact with pancreatic secretion, which causes erosion of the vessels, which can lead to the formation of a pseudoaneurysm. Pseudoaneurysms are known to rupture and therefore can cause late hemorrhage [1, 4, 7, 8].

Many authors agree that the consistency of the pancreas plays an important role as a risk factor for pancreatic fistula and thus hemorrhage. A soft pancreas is considered an unfavorable factor in terms of the severity of the postoperative period [4, 7].

In this context, a study found that history of cardiovascular disease and use of anticoagulants were not significant risk factors for PPH, but the highest values of drainage fluid amylase within 3 days - 10,000 U/l, highest CRP level within 3 days - 15 mg/ dl and incidence of abdominal infections have been identified as independent risk factors for PPH [3]. Although these factors cannot be measured preoperatively, it is possible to predict the incidence of postoperative hemorrhage. Although pancreatic fistula has been reported as a predictive factor for PPH [3, 9].

Previous studies reported that common sites of postpancreatectomy hemorrhage were the gastroduodenal artery stump, splenic artery, hepatic artery, and gastric arteries. with awareness of bleeding from unusual sources, such as DPA, would reduce the risks of technical and/or clinical failures requiring additional procedures such as surgical management [2, 5, 10, 11].

A review showed that the sensitivity of angiography (69%) for identifying the source of late postpancreatectomy hemorrhage was comparable to that

of CT (67%). The unidentified cases (25%) are probably due to the intermittent nature of the postpancreatectomy hemorrhage and the CT scan can provide, in these cases, additional information such as the location of the hematoma and a pseudoaneurysm (partially) thrombosed. Endoscopy failed to identify the location of bleeding in 31% of patients with overt luminal bleeding and may therefore be of limited use as a first-line diagnostic tool in this case [1].

EVT as a feasible option in the management of delayed PPH is well documented for treating common bleeding sites [1-5, 10, 11]. Nevertheless, it has been proposed that lack of awareness of bleeding from unusual sources, such as the DPA, would increase the chances of technical problems and/or clinical failures that require additional procedures such as reintervention [2, 5].

Although embolization of the splenic artery in cases of acute hemorrhage is generally considered safe, there are reports of necrotizing pancreatitis, splenic infarction, gastric ischemia, or rebleeding due to DPA [2, 5]. What prompted authors indicated that careful anatomical evaluation and superselective TAE must be performed to prevent necrotizing pancreatitis [2, 5, 12].

In one study the clinical success rate of TAE for the treatment of DPA hemorrhage was 84.2% [5]. Which is comparable to other reports on embolization of DPA hemorrhages [10, 13]. When angiography was performed in patients with clinical failure, the initially embolized hemorrhagic focus was well obstructed, but a new hemorrhagic focus was revealed. This implies that the effect of actual embolization is higher than the clinical success rate [5]. It is important to note that up to 45% of "sentinel hemorrhages" recur with massive bleeding [4].

An objective meta-analysis found that the mortality rate is lower after a primary endovascular approach than after primary relaparotomy and primary endoscopy (i.e. 15%, 37%, 24%, respectively). The endovascular approach was the main treatment for most late postpancreatectomy hemorrhages [1]. A possible explanation for the difference in mortality rates between interventional strategies could lie in their respective indications. In most cases, relaparotomy is used as a last resort for hemodynamically unstable patients especially since these patients are often severely impaired and potentially affected by a postoperative pancreatic fistula and major revision surgery can lead to a fatal systemic inflammatory response [1]. Additionally, identifying the source of hemorrhage during relaparotomy can be difficult, particularly in a patient with a severe postoperative pancreatic fistula [1, 5]. Even in cases of intraluminal hemorrhage, interventional endoscopy fails to adequately identify the source of the hemorrhage and therefore almost always results in a delay in adequate treatment, potentially leading to a fatal outcome [1].

CONCLUSION

Through this case report, it became evident that unusual origins may be the cause of postpancreatectomy hemorrhage, such as the dorsal pancreatic artery. Which can be difficult to treat due to the difficulty of predicting its origin, anatomical variations, difficulties of superselection, but also due to the rich collateral circulation.

Endovascular treatment (TAE) is increasingly used as a treatment modality for arterial hemorrhages. And this doubt is one of greater effectiveness and safety than other therapeutic alternatives in the management of delayed postpancreatectomy hemorrhage.

Conflicts of interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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