



Pancreaticoduodenal Artery Aneurysm: A Rare Cause of Hemorrhagic Shock in Full Well-Being Patient

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Abstract

Hemorrhagic shock from PDA rupture is rare but with poor prognosis. Common presentation in the cases of acute spontaneous rupture of PDA are very sneaky. For this reason, about 49% of these patients died. Few cases are described in the literature. We described a 46 years old healthy patient that arrive in emergency per subacute abdominal pain and showed signs of hemorrhagic shock shortly after. Despite absence of precise guidelines of diagnosis and management, different experiences reported, had in common: (A) rapid resuscitation and transfer to the operating room (angiographic or surgical), (B) rapid control of the bleeding site (C) determination of exact cause of bleeding, and (D) definitive treatment by obliteration, excision, or both.

Introduction

Pancreaticoduodenal Artery Aneurysms (PDAs) are rare, accounting for only 2% of all visceral artery aneurysms [1-3]. The precise mechanism is not fully known. However, weak tunica media and increased intravenous pressure are thought to be possible causes of rupture. They occur as either true aneurysms or pseudoaneurysms secondary to various underlying events, including pancreatitis, trauma or associated with Celiac Artery (CA) occlusive disease with entrapment by the Median Arcuate Ligament (MAL) [2].

Predisposing factors in the pathogenesis include arteriosclerosis, mycotic infection, rheumatoid vasculitis, congenital, pregnancy and portal hypertension [3,4]. Although 35% of reported cases of PDA have presented without rupture and are often found incidentally or associated with abdominal discomfort, the rest have presented subsequent to rupture. When PDA rupture occurs, often in patients in full well-being, unfortunately carries a 49% mortality, with fatal bleeding into the retroperitoneal space, intraperitoneal cavity, or gastrointestinal tract [1]. The acute event without a diagnosis of suspicion and the location of the PDA makes the cure a real challenge against time. The majority of reports describe these aneurysms as located either behind or within the parenchyma of the pancreas, making diagnosis and complete excision difficult without prior knowledge of the nature of the process [1]. In fact, depending on this, the symptoms may vary from shock associated with or without abdominal tension, whether or not associated with digestive bleeding.

Case Presentation

A healthy 46-year-old man came in hospital during the first hour of the night for subacute abdominal pain. The patient had no history of pancreatitis or traumatic injury.

He reported feeling of fleeting malaise in the same morning which regressed spontaneously. At the entrance in the emergency room, the patient was hemodynamically stable. An abdominal examination found tension of abdominal muscle, tenderness and rebound pain in the right upper abdomen, but no obvious mass. Blood test results were normal (hemoglobin 12 g/dl).

Ultrasound performed, described a not uniform mass of 20 cm in the Morrison's pouch. Urgent CT scan with contrast was requested. During the CT scan, suddenly he felt cold sweating and discomfort so the CT scan was interrupted for immediate life support. Patient was borderline responder to damage control resuscitation with immediate crystalloids infusion. CT scan, completed as fast as possible, revealed huge hematoma of about 23 cm placed in the adipose mesentery plane and in the retroperitoneum with active loss of contrast, by a branch from Superior Mesenteric Artery (AMS) (Figure 1).

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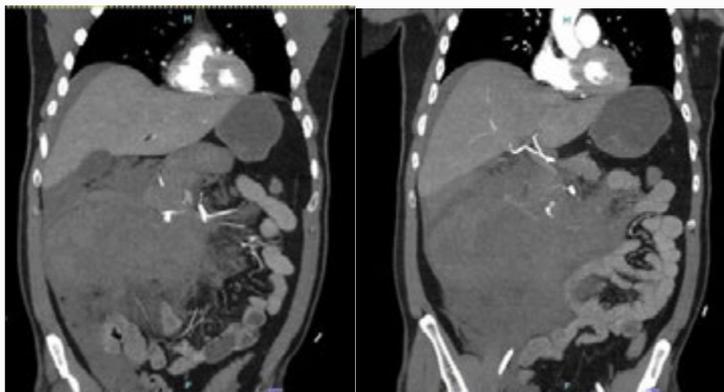


Figure 1: First CT scan.



Figure 2: Angiography frame after metallic spirals apposition.

The patient had shock signs, lactate was 4 mmol/l, so we decided to bring patient in operating room for immediate laparotomy, alerting interventional radiology for subsequent immediate approach if needed. Damage control laparotomy took 15 min, minimum free fluid in peritoneum was revealed. The most significant relic was huge retroperitoneal hematoma in right zone II. Packing in this area with 10 gauze was performed and after temporary abdomen closure, the patient was carried to interventional radiology room. Arteriography of the celiac tripod and AMS was done. Displayed bleeding pseudoaneurysm in the anastomotic branch between the gastroduodenal artery and the first branch of AMS. Embolization with metallic spirals

of the pseudoaneurysm by both arterial branches that supply it, was made (Figure 2).

Patient was carried out to intensive care. After 3 h, a new shock episode was registered, and lactate value increased to 7.5 mmol/l while hemoglobin remains about 11 mg/dl. CT scan was performed once again and blush of contrast was still evident, near the most proximal spirals to the celiac tripod. An increase in abdominal free fluid was also documented. A new interventional procedure demonstrated a persistent but lower blush than the previous one. A new embolization by super selective catheterization is performed with microparticles (Embozene 500 micron) and glue (Glubran) (Figure 3).

Despite the new procedure, the patient's hemodynamics remained unstable and hemoglobin decreased to 5.8 g/dl. A new urgent laparotomy was necessary. This started with de-packing. The previously described hematoma is increased in volume and it extended through the root of the mesentery to Treitz. Mobilization of the right colon and Kocherization for access to the pancreatic duodenum block was performed. Active bleeding from the pancreas head was revealed. Hemostatic points were applied to the head of the pancreas with a noticeable reduction in bleeding. Packing of the pancreatic duodenum block was done and hemostasis was finally obtained. Temporary closure of the abdomen was performed. The patient was carried in ICU once again. In the following hours, the patient finally maintained a stable dynamic. After 48 days, the patient was again taken to the operating room. After the de-packing, no further sources of bleeding were found. Hemostatic gauze was applied to line the pancreatic head and two peripancreatic drains were placed. After one week, a control scan was performed with contrast agent

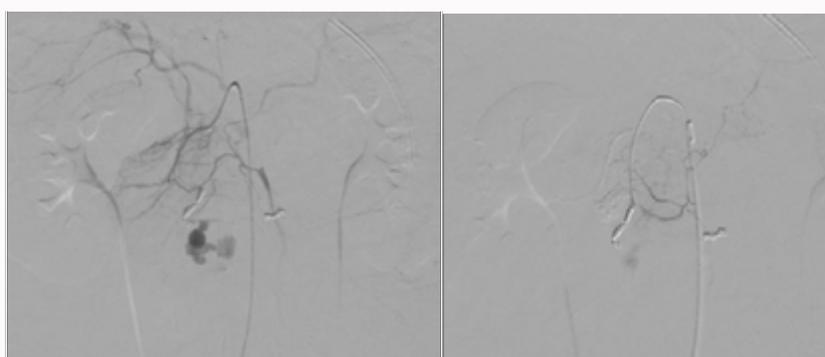


Figure 3: Blush and frame after new embolization.



Figure 4: Last TC scan.

administration per os with regular duodenal transit. The patient was discharged in 28-day post-op after a resolution of grade B pancreatic fistula (Figure 4).

Discussion

Common presentation in the cases of acute spontaneous rupture of PDA are very sneaky. For this reason, about 49% of these patients died. Few cases are described in the literature. Neschis et al. [1] in the 1998 described two cases required surgery and arteriography [1]. The same author reviewed about 73 cases of PDA rupture, focusing on 11 cases in which the patient presented in severe, sudden, abdominal pain and shock. The mortality rate in these 11 cases was 36%, with half of these patients not reaching the operating room alive. The mortality rate did not correlate with age. Sarigoz et al. [3] reported a case of 57-year-old woman who was admitted to the emergency department with abdominal pain and unconsciousness. A computed tomography scan showed extravasation of contrast agent at the head/corpus junction of the pancreas, and the patient underwent exploratory laparotomy under general anesthesia. During laparotomy, aneurysmatic rupture of the right gastroepiploic artery was detected. Control over bleeding was achieved by ligating the right gastroepiploic artery at its origin. The same author reported that hemostasis could be achieved through transarterial catheter embolization, however, if the radiologist has no experience in this area and if technical difficulties occur, surgical treatment is usually required. Despite the few cases of literature and consequently the absence of precise guidelines of diagnosis and management, different experiences reported, had in common: (A) rapid resuscitation and transfer to the operating room (angiographic or surgical), (B) rapid control of the bleeding site (C) determination of exact cause of bleeding, and (D) definitive treatment by obliteration, excision, or both. The rupture risk of pDA is independent of size [1,5,6].

Like trauma patient the first hour is the most important. If hemodynamic stability allows time for a diagnostic workup, angiography and transcatheter embolization is the choice treatment. However, this is not always technically possible, because pDA rupture may preclude itself cannulation of the feeding vessels to the aneurysm. The complete proposal of treatment consists of: Conservative treatment, interventional radiology (angiography ± embolization) and surgery (damage control or definitive surgery), depending on the etiology and hemodynamic stability of the hemorrhage [7]. Even in larger cases [5], is reported multimodal treatment is the choice for achieve hemostasis, for example surgery after initial angiography or the opposite, depend on the hemodynamic status. What seems clear is that the great majority of cases of PDA rupture not treated definitively have resulted in patient death immediate or within 30 days [5].

Conclusion

Hemorrhagic shock from PDA rupture is rare but with poor prognosis. If patient arrive alive in the hospital, the challenge is to control bleeding in the most expedient manner, using the least amount of dissection possible, after which the patient should be immediately transported to the angiography suite for definitive diagnosis and evaluation of the vascular anatomy. After angiography, the patient can be returned to the operating room for further definitive repair if necessary.

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