



Pancreas sparing duodenectomy and aortic reconstruction with custom-made bovine pericardial tubular graft for primary aorto duodenal fistula.

Case report

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Pancreas sparing duodenectomy and aortic reconstruction with custom-made bovine pericardial tubular graft for primary aorto duodenal fistula. Case report

Primary aorto-duodenal fistula (PADF) is a rare life-threatening condition consisting in a direct communication between the abdominal aorta and the gastrointestinal tract without any previous vascular intervention. PADF results most commonly from an abdominal aortic aneurysm (AAA) or aortic bacterial/mycotic infection, with the fistula forming between the native aorta and the third or fourth portion of the duodenum. Symptoms are nonspecific and the diagnosis is often delayed after AAA rupture with high rate of morbidity and mortality. We present a case of 69-year-old-male with a history of untreated abdominal aortic aneurysm who came to the attention of the emergency department for Abdominal aortic aneurysm rupture (RAAA). The patient was successfully treated with staged therapy: endovascular aneurysm repair (EVAR) to control hemorrhage rapidly, followed by pancreas sparing duodenectomy and aortic reconstruction with xenopericardial tube grafts.

KEY WORDS: Biological graft, Bovine pericardial tubular graft, Primary aorto-duodenal fistula, Pancreas sparing duodenectomy

Introduction

Primary aorto-duodenal fistula (PADF) is a rare life-threatening condition consisting in a direct communication between the abdominal aorta and the gastrointestinal tract without any previous vascular intervention. PADF results most commonly from an abdominal aortic atherosclerotic aneurysm or infection (bacterial or mycotic etiology), with the fistula forming between the aorta and the third or the fourth portion of the duodenum.

Rarely PADF can be related to radiation therapy, Q fever

or Behçet's disease, PADF involving normal size-aorta is even more rare. A secondary PADF occurs after aortic surgery such vascular graft placement.

Yearly incidence of primary aortic duodenal fistula is 0,007 per million, incidence at autopsy is 0,4% to 0,7% ¹ with roughly 250 cases reported in literature ². Even if a classical triad of symptoms is reported in the literature (gastrointestinal bleeding, pulsating, palpable mass, and abdominal pain) clinical diagnosis of PADF is not even remotely easy, in fact symptoms are non-specific and may include back pain, melena, fever, sepsis and shock.

Owing to subtle clinical presentation and low incidence of the disease, PADF diagnosis is often neglected leading to intraoperative or post-mortem identification. Detection on CT scan is also difficult, but PADF should be considered by radiologists in case of GI bleeding. Treatment includes either open surgery or endovascular repair as well as both strategies in staged modality.

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Case presentation

We present a case of 69-year-old-male with a history of untreated abdominal aortic aneurysm (AAA) who came to the attention of the emergency department for abdominal pain and pulsating abdominal mass, with no history of previous pathologies.

Computed Tomography Angiography (CTA) showed rupture of the large infrarenal abdominal aorta aneurysm and suspect presence of fistolization between the aorta and the third portion of the duodenum. We decided to perform an emergency procedure of endovascular aorto-bisiliac stent graft placement (Gore Conformable) the same day of hospitalization to control the bleeding. Fluoroscopy showed appropriate stent graft position, patency, and no sign of endoleak. During the first post-operative day in ICU, rectal bleeding was reported, hemodynamic was stable as well as hemoglobin levels so urgent Gastroduodenoscopy was performed and confirmed presence of fistula ostium on the third portion of duodenum.

Considering the diagnosis of PADF we agreed to perform staged procedure with general and vascular surgery, patient was informed and brought to operation room on the same day.

Laparotomy disclosed aneurysm sac to be tenaciously adherent to the third portion of the duodenum, gastroduodenal ligament was sectioned and Kocher maneuver was performed to obtain complete exposition and mobilization of the duodenum. Then aneurism sac was carefully dissected from the duodenum and the fistula tract wide-opened (Fig. 1). Fistula's ostium on the duodenum was adequately distant from the ampulla of Vater allowing pancreas sparing duodenal resection (Fig. 2). The first jejunal loop was resected using a linear stapler 10 cm afterward ligament of Treitz. Then the third and fourth duodenal portions were dissected from the superior mesenteric vessels and pancreatic gland. The duodenum was sectioned between the second and third portion, above the fistula ostium. A manual end to side double-layer isoperistaltic duodenojejunostomy was realized between the second duodenal portion and the jejunum (Fig. 3). At this point aneurism sac and abdominal aorta were prepared. After aortic cross-clamping,

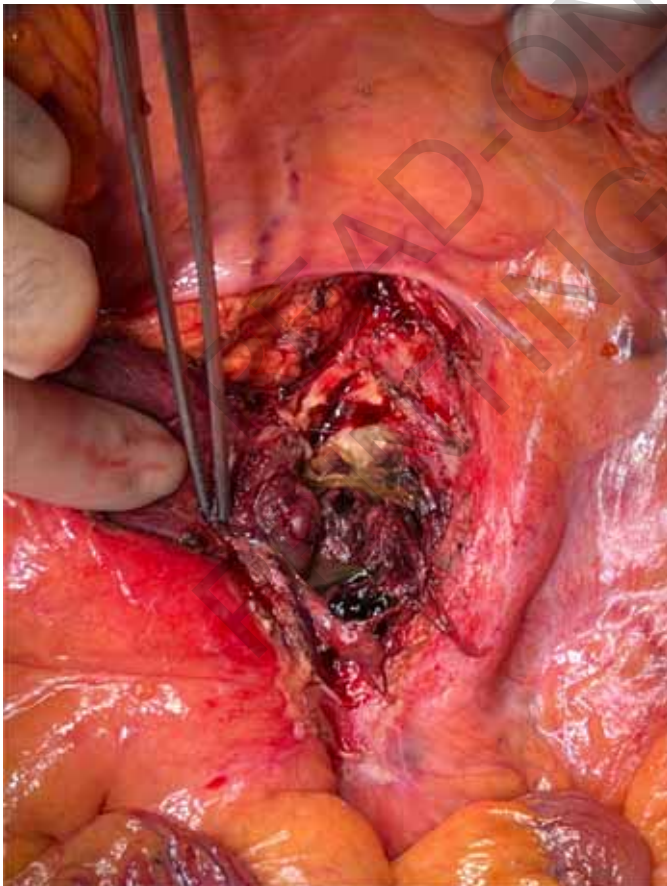


Fig. 1: Dissection of the aneurism sac from the third portion of duodenum exposing the fistula tract.

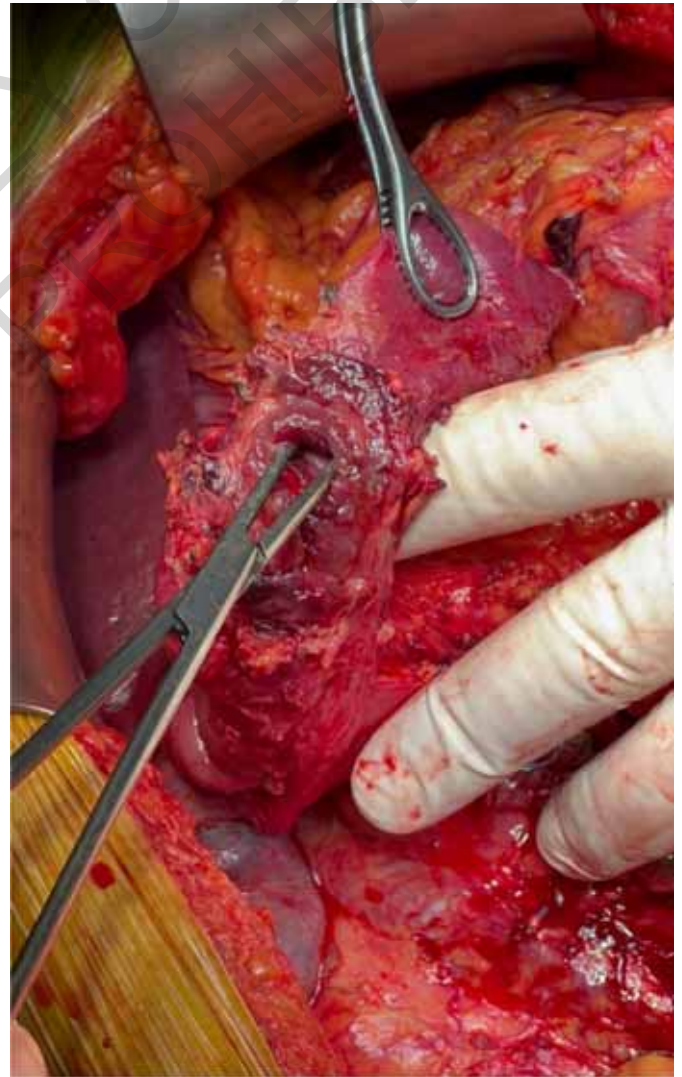


Fig. 2: Duodenal ostium of the aorto-duodenal fistula.

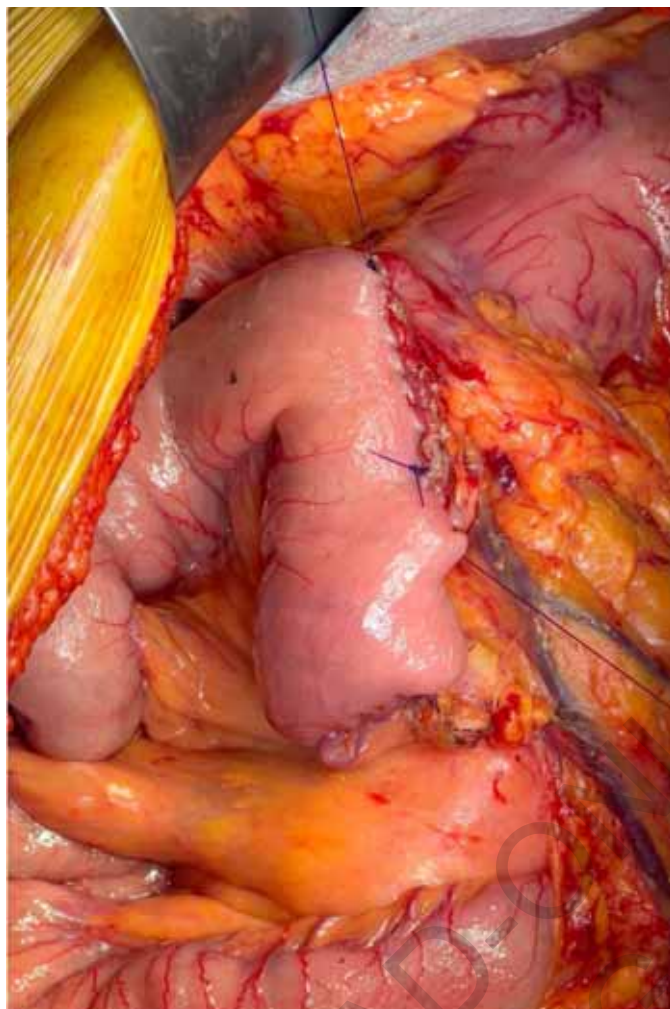


Fig. 3: Manual end to side double-layer duodeno-jejunostomy.

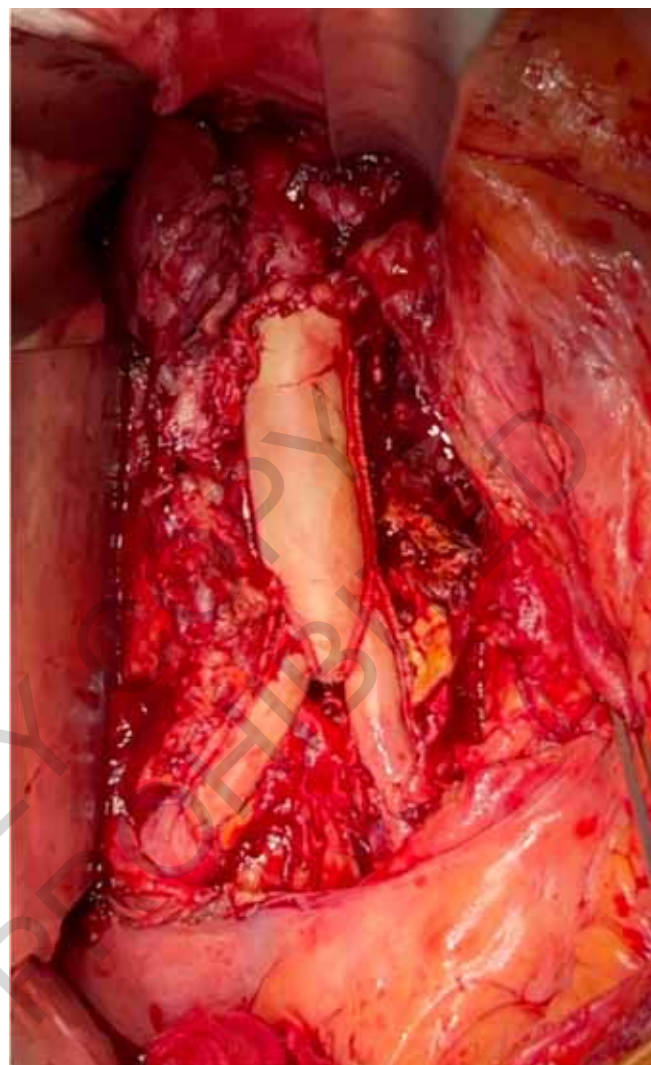


Fig. 4: Xenopericardial aorto-bisiliac graft.

heparinization and endovascular graft removal, xenopericardial aorto bisiliac graft (18-9 mm) was placed (Fig. 4). Postoperative course was complicated by pulmonary infection that has been successfully treated, the patient was discharged in 18th postoperative day.

Discussion

Primary aortic duodenal fistula is a very rare life-threatening condition with high mortality rate. It was described the first time by Astley Cooper in 19Th century as a condition caused by spontaneous erosion of the aorta into the gastrointestinal tract ³. PADF incidence is reportedly 0.04% to 0.07% ³, it is often fatal, with a mortality rate of 80-100% without surgery ⁴. Etiology is unknown, it appears to involve either sepsis, mechanical trauma between the aortic wall and adherent intestine or a combination of both.

PADF frequently occurs at the third portion of the duodenum (54%) because of its retroperitoneal fixation and proximity to the aorta, other localization are esophagus (28%), jejunum and ileum (12%), colon (3%) and stomach (2%) ³.

The typical symptoms consist of abdominal pain, gastrointestinal hemorrhage, and a pulsatile abdominal mass. However, this classic triad occurs only in 23% of cases. The most common symptoms of an actively bleeding fistula are hematemesis, melena, hypotension and abdominal pain. Non-bleeding fistulae may simply present as abdominal pain ⁵. GI bleeding is often accompanied with symptoms and signs of infection, such as fever, generalized malaise, and leukocytosis.

Despite advances in imaging and endoscopic technology, diagnosis of PADF is still difficult. CT scan has an estimated sensitivity of 60%, remaining the most sensitive imaging modality.

Optimal management remains unclear. Therapeutic

Riassunto

approaches in patients with PADF may be either open surgery or endovascular repair or both with staged strategy. In hemodynamically unstable patients, endovascular surgery can rapidly control the acute bleeding allowing enough time to stabilize the patient. However endovascular stent graft is associated with a high risk of novel, persistent or recurrent infections as well as recurrent bleeding, representing only a bridge therapy in emergency conditions. Furthermore, PADF is frequently associated with abdominal aortic aneurysm infection that can't be eradicated by endovascular treatment. To obtain complete resolution of the disease open surgery is mandatory. There is no consensus on the optimal surgical approach of aortic prosthesis infections. Extra-anatomical bypass and repair of the enteric tract are the treatment of choice in cases of gross contamination; however, this technique is associated with survival rates of 40–60%³. In situ reconstruction is often reported as an effective surgical option in case of mild bacterial contamination. The reported survival rate for in-line reconstruction is 61–77%.

The standard procedure is complete removal of the infected area with extensive debridement, followed by in situ replacement with a Dacron graft, rifampicin-soaked Dacron graft, or cryopreserved homograft combined with antibiotic treatment. In this paper we describe a case of PADF treated with Xenopericardial tube graft, that represent a new and valid option as neo-aortic segments. Xenopericardial tube graft is having encouraging results regarding durability and freedom from reinfection and reoperation⁸. In any case, regardless of type of material used, interposition of omentum between the graft and the enteric suture line is strongly recommended. Moreover, antibiotic therapy should be initiated since the suspicion of ADF, first empirically, then based on the results of microbiological tests and antibiograms. A longer duration of the therapy is recommended.

Conclusion

PADF is a very rare life-threatening condition with high risk of mortality. There is no standardized treatment, a staged therapy could reduce mortality e morbidity of surgery. Furthermore, the use of xeno-pericardial tube grafts represents a valid alternative option as new aortic segment.

La fistola aorto-duodenale primitiva è una patologia rara ma potenzialmente letale consistente nello sviluppo di una comunicazione diretta tra aorta nativa o un aneurisma dell'aorta addominale con la terza o la quarta porzione duodenale.

I sintomi sono aspecifici e la diagnosi è spesso conseguente alla rottura dell'aneurisma con un alto tasso di mortalità e morbidità. Presentiamo il caso clinico di un uomo di 69 anni giunto in pronto soccorso per dolore addominale e massa pulsante mesogastrica.

La Angio-TC ha evidenziato la rottura di un aneurisma dell'aorta addominale e una sospetta fistolizzazione tra la sacca aneurismatica e la terza porzione duodenale. Il paziente è stato pertanto sottoposto in regime di emergenza a posizionamento di endoprotesi aorto-bisiliaca (Gore Conformable).

In prima giornata in seguito ad episodio di rettorragia è stato sottoposto ad EGDS con conferma della presenza di tramite fistoloso aorto-duodenale. Si è pertanto deciso di procedere con intervento multi-step combinato: duodenectomia pancreas-sparing e successive aneurismectomia, debridement del tessuto aortico e confezionamento di innesto aorto-bisiliaco con graft protesico in xeno-pericardio bovino (18-9mm) protetto con omento-plastica.

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