

Spontaneous rupture of a splenic artery pseudo-aneurysm post sleeve gastrectomy: case report

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Abstract

Pseudo-aneurysm of the splenic artery is a rare phenomenon in young males without risk factors and its rupture represents a true emergency. This condition is difficult to diagnose because the symptomatology is often blurred and not straight. Diagnosis should be as fast as possible to reduce patient mortality. With this

case report we would like to report our experience of a successfully managed case of splenic artery pseudo-aneurysm rupture in a young man without risk factors and with a history of sleeve gastrectomy.

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Introduction

An aneurysm is defined as a vascular malformation that leads to an increase in the diameter of the vessel of at least 50% compared to normal with the involvement of all the layers of the artery.¹ The formation of an aneurysm may be due to multiple factors, some congenital, such as congenital vascular malformations or collagenopathies, and others acquired such as atherosclerosis, hypertension, dyslipidemia, obesity, diabetes mellitus, and tobacco smoking.²

The pseudo-aneurysm or “false aneurysm”, on the other hand, is generally an acquired vascular malformation that consists of a rupture of the intima layer of the vessel and the consequent accumulation of blood between the tunica media and the adventitia. Splanchnic pseudo-aneurysms involve the superior and inferior mesenteric artery and their branches, are rare events, and are usually caused by abdominal trauma, abdominal or endovascular surgery, pancreatitis, and more rarely by complicated peptic ulcer. Pseudo-aneurysm of the splenic artery occurs more frequently in the female sex, particularly during pregnancy and puerperium due to several co-factors.

We report a case of successfully treated atraumatic rupture of a pseudo-aneurysm of the splenic artery.

Case Report

A 42-year-old man came to the Emergency Room (ER) with abdominal pain that was more focused on the left side. The pain started the previous evening and was accompanied by two syncopal episodes. He reported taking Proton Pump Inhibitors (PPI) for pain relief, without benefit. Upon arrival in triage, the patient's Blood Pressure (BP) was 160/90 mmHg, Heart Rate (HR) was 107 beats per minute, the peripheral SpO₂ was 100% in Ambient Air (AA). The patient appeared pale and suffering. Upon the initial Arterial Blood Gas (ABG) analysis at the arrival, there were no significant alterations: pH 7.46, Partial Pressure of Carbon Dioxide (pCO₂) 37 mmHg, HCO₃ 22.1, BE -1.8, Lac 1.2, Hemoglobin (Hb) 11.9 g/dL. In the patient's medical history, there was a previous sleeve gastrectomy three years prior, which had no post-operative complications. The patient also underwent varicocelelectomy at a young age and he was currently being treated for gastroesophageal reflux with PPI. The patient did not report any history of recent or previous abdominal trauma or pancreatitis. However, he mentioned that he used to smoke actively until six months ago. His family history did not show any aneurysmal ruptures or other known cardiovascular risk factors. He also reported experiencing

gastric intolerance to acetylsalicylic acid. The patient appeared alert and oriented but presented pale skin and tachypnea. Upon palpation, the abdomen was tender but more painful in the epigastric region and left flank. The patient did not complain of percussion pain in kidney lodges. An abdominal ultrasound was performed in the ER, which detected a large intraperitoneal effusion mainly located in the Douglas pouch. The abdominal aorta was regular in its course. During the examination, the patient suddenly presented hypotension, dropping to BP 85/40 mmHg. In response, we began fluid filling with 1000 cc of saline solution 0.9% with good hemodynamic response (BP increased to 130/70 mmHg). Due to the suspicion of massive intraperitoneal bleeding, an abdominal Computed Tomography (CT) scan with contrast was performed immediately. The CT scan showed an abundant hemoperitoneum, which was most noticeable in the splenic loggia, adrenal, left hypochondrium, and on the left side of the pelvis (Figure 1). A globose formation of about 4 centimeters was detected before the pancreatic tail, in the splenic ilo, with an over-fluid-blood density, which was suspected to be from a pseudo-aneurysm of the splenic artery (Figure 2, Figure 3). Abundant blood had collected around it. After leaving the CT scanner, the patient's blood pressure dropped significantly (BP 75/35 mmHg), heart rate increased to 100 bpm, oxygen saturation level was at 96% with O₂ therapy 4L/min nasal cannula, and respiratory rate was at 27 acts/min. He was immediately transferred to the shock room and underwent another ABG analysis, which showed the following results: HCO₃ 17.2, BE -4.8, Lac 3.7, Hb 9. To treat the patient's condition, they were given 2 units of Red Blood Cell Concentrates (RBC), 1000 mg of tranexamic acid, 1000 IU of prothrombic complex (used off-label in the suspicion of a possible undiagnosed coagulopathy), 2000 cc of crystalloids, and 500 cc of synthetic colloids. To maintain perfusive BP, they were given vasopressin 0.03 U/min and

noradrenaline 0.3 mcg/kg/min. The patient was then intubated and transferred to the operating room for an urgent laparotomy. During the procedure, the patient received 1 unit of RBC concentrate, 500 ml of crystalloid liquids, 500 ml of colloidal liquids, 900 ml of plasma, 1 g of fibrinogen, and 40 mg of 4 ampoules of albumin with progressive reduction of the aminic support. In the operating

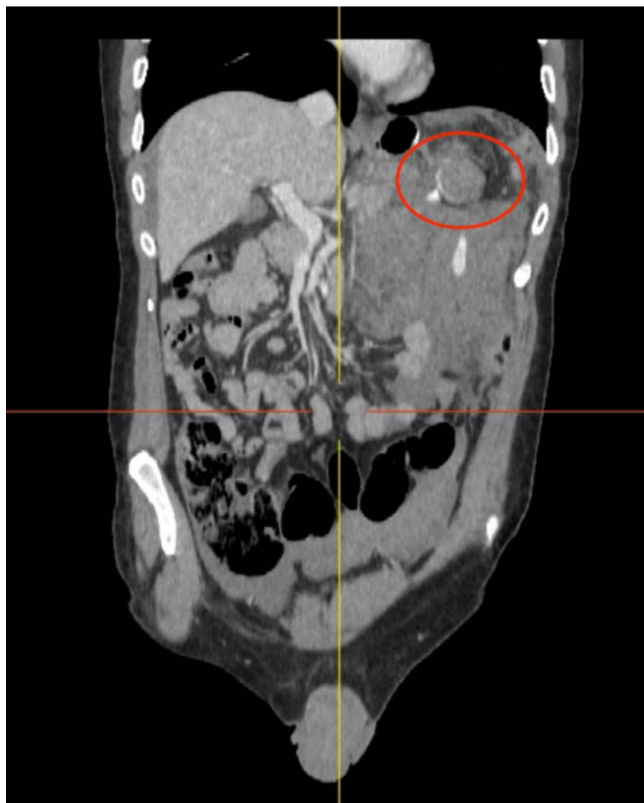


Figure 1. Computed Tomography (CT): sagittal view of the pseudo-aneurysm with abdominal blood effusion.



Figure 2. Computed Tomography (CT) image (arterial phase): view of the globular formation of the pseudo-aneurysm, with iodine contrast effusion (Xenetix 350, 115 mL).

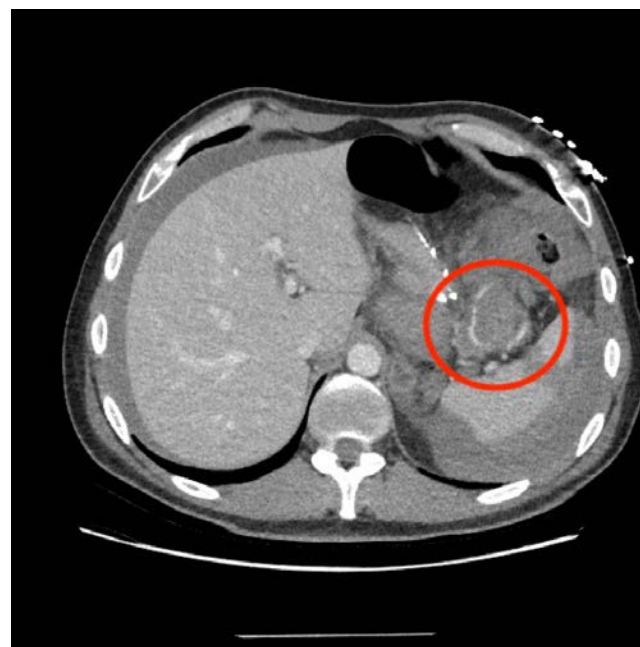


Figure 3. Computed Tomography (CT) image venous phase: view of the globular formation of the pseudo-aneurysm, with iodine contrast effusion (Xenetix 350, 115 mL).

room, a splenectomy was performed with the removal of the pseudo-aneurysm, and a fibrous retraction area was found encompassing the clip of gastric resection near the splenic ilo. After the surgery, the patient required two additional RBC concentrates. At the time of discharge, which was seven days later, the patient was asymptomatic and in good hemodynamic compensation of circulation.

He was advised to undergo bi-weekly monitoring of the Complete Blood Count (CBC) and a surgical follow-up after one month. During the control, the patient showed normalization of the CBC and a complete recovery of autonomies.

Discussion

Splenic aneurysms and pseudo-aneurysms affect the celiac artery, upper and lower mesenteric, and their branches. Aneurysms are defined as the thinning of all three walls of the vessel with a diameter 1.5 times larger than normal. Pseudo-aneurysms consist of an abnormal dilation of the arterial vessel, leading to the lesion of a single wall of the vessel, resulting in an accumulation of blood contained by the adventitia.³ These are rare lesions, with an incidence ranging from 0.1% to 0.2%. They are usually asymptomatic, or with highly non-specific symptoms, until the moment of rupture. These are diseases that are diagnosed at an advanced stage, complicating a high rate of deaths. Pseudo-aneurysms have a higher rate of rupture than real aneurysms, especially pseudo-aneurysms of the splenic artery, which have a risk of rupture of 37% and a mortality of up to 90% if not treated, regardless of the diameter of the lesion.³ Among the known causes of pseudo-aneurysm of visceral vessels in the literature are inflammatory processes such as pancreatitis, abdominal trauma, or iatrogenic lesions.⁴ Usually, the patient is asymptomatic until the phase of rupture of the vessel, when he presents with non-specific symptoms of malaise, abdominal pain, nausea, and vomiting. In the phase of rupture, the patient complains of abdominal pain, sweating, and, in severe cases, hemorrhagic shock. If the patient's hemodynamic is stable, abdominal angio-CT is the gold standard for the diagnosis of these vascular pathologies. If the patient presents with hemorrhagic shock, the diagnosis is made during the operation. The choice of technique and timing of treatment depends on the state of the vessel. Pseudo-aneurysms require treatment at the time of diagnosis regardless of the presence of symptoms, while real aneurysms are treated in an emergency if symptomatic. Otherwise, a monitoring attitude is preferred, and possible treatment in the election. In both cases, the rupture of the vessel becomes an absolute indication of treatment in an emergency.

The treatment of Visceral Artery Aneurysms (VAAs) and Visceral Artery Pseudoaneurysms (VAPAs) can be managed using endovascular techniques or open surgical repair with reconstruction which are considered to be the best strategy, particularly among those patients who are hemodynamically unstable and in need of emergency management.⁵⁻⁹ Endovascular treatment has been proven to reduce perioperative complications and the duration of hospitalization compared with an open surgical approach but is associated with increased rates of reintervention.¹⁰ Open surgery has the advantage of durability, reduced need for follow-up, and lower mortality rates in elective repairs.^{3,11}

For ruptured VAAs/VAPAs an open approach is often required for rapid control of hemorrhage, especially in hemodynamically unstable patients. Endovascular treatment may be an option for rupture aneurysm and pseudo-aneurysm in selected patients who

remain hemodynamically stable, particularly poor-risk surgical candidates due to comorbidities, in the setting of a hostile abdomen, or when the aneurysm is not easily accessible.

Conclusions

The occurrence of a pseudo-aneurysm of the splenic artery is a rare event, particularly in young males without underlying health conditions.⁵ Reported cases of this condition have been linked to post-pancreatitis or gastric ulcer. In recent years, bariatric surgery has become increasingly common, and during such procedures, clips are often used. This article discusses a case of a patient with a history of sleeve gastrectomy, who had no known risk factors for pseudo-aneurysm of the splenic artery but developed this condition after undergoing the surgery. In the literature, there are several similar cases of patients presenting with pseudo-aneurysm of the splenic artery without risk factors but have undergone bariatric surgery with positioning of clips,⁶⁻⁸ but there are no conclusive pieces of evidence of a direct correlation between endo abdominal clip placement and the development of pseudo-aneurysm. The purpose of this article is to draw attention to the possible risks associated with abdominal surgery interventions with the use of clips and the development of pseudo-aneurysm.

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