Case Report: Rare cause of lightning gastrointestinal haemorrhage: pseudoaneurysm of superior mesenteric artery caused by gunshot wound

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Author Name:

L.Kallouch, F.Z. Laamrani, L. Jroundi

Emergency radiology department, CHU
Ibn Sin, Rabat, Maroc**Corresponding Author:**

L.Kallouch

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properly cited.**ABSTRACT**

Comparing to aneurysms, pseudoaneurysms carry a higher frequency of complications, early rupture being the most frequent and dangerous, as it can lead to a life-threatening shock. Traditionally, they are associated with trauma, infection, and inflammatory disease. SMA and branches pseudoaneurysms are the rarest forms of visceral pseudo-aneurysms.

Unlike true aneurysms that have all three arterial wall layers, pseudoaneurysms develop from the disruption of intimal and medial layers of the arterial wall and do not contain any epithelized wall, hence the high risk of complications, they are typically outlined by thin fibrous tissue and are usually surrounded by periarterial hematoma. Presentation of pseudoaneurysms may vary from the absence of symptoms to life-threatening haemorrhage and death, but in context of Abdominal penetrating trauma, it can lead to hemorrhagic shock and ischemic colitis. Computed tomography angiography is considered the gold standard for diagnostics.

Introduction

Abdominal penetrating trauma can lead to haemorrhagic shock and ischemic colitis caused by vascular injury but post-traumatic visceral arterial pseudoaneurysms are rare vascular entities with a high mortality rate.[1] Visceral arterial pseudoaneurysms usually caused by trauma and pancreatitis in the first place then comes the rare causes as infection, inflammatory disease or they arise as a post-operative complication [2].

A pseudoaneurysm of a visceral artery corresponds to an encapsulated hematoma, contained, in communication with the lumen of the artery, in contrast to true aneurysms which involve all three layers of the arterial wall [2]. It associated with a high risk of rupture whatever its size and typically manifested by lightning intra or retroperitoneal bleeding, hence the interest of a systematic treatment [3]. We report a rare cause of lightning gastrointestinal haemorrhage causes by a pseudoaneurysm of superior mesenteric artery by bullet wound.

Case report:

25-year-old patient admitted to the emergency room for an abdominal gunshot trauma, on admission, a patient was received in a state of haemorrhagic shock due to a lightning digestive haemorrhage. In the emergency room, the patient received rapid conditioning and then referred to the radiology department for a thoraco-abdomino-pelvic scan (TAP scan) which demonstrated the presence of a pseudoaneurysm of the superior mesenteric artery (figure 1) as well as a hemo -pneumo-peritoneum of low abundance, it is also associated with the individualization of multiple spontaneously hyperdense foreign bodies which correspond to the lead shot especially on the topogram (figure 2). The patient is subsequently referred to the operating room but unfortunately died.

Discussion

The most commonly identified causes of superior mesenteric artery pseudoaneurysm is pancreatitis or trauma. [4] Superior mesenteric artery and branches pseudoaneurysms account for approximately 6% to 8% of all visceral artery pseudo-aneurysms, and its incidence is as low as 0.01%[6]

The superior mesenteric artery pseudoaneurysms, unlike other visceral artery pseudoaneurysms, often cause clinical symptoms especially threatening intra-abdominal or retroperitoneal haemorrhage and demand in-time intervention [5]. The danger inherent in these pathological lesions is their potential to rupture (38%), case of our patient [6].

The incidence of rupture of pseudoaneurysms varies from 2 to 80% depending on the location, with untreated mortality rates reaching up to 100% [7–9]. The more frequent location of visceral aneurysm is the splenic artery (60%), followed by the coeliac trunk, the renal artery, the hepatic artery, the superior mesenteric artery (SMA) and its branches, the gastroduodenal artery, the pancreaticoduodenal artery, the gastric artery, and a combination of these.

The most common symptom (50–63% cases) is haemorrhage, which can present as gastrointestinal bleeding due to rupture of pseudoaneurysm [7, 10, 11]. Pain is the next common presentation, seen in one third of patients [10]. Uncommonly, a hematoma can cause mass effect.

Computed tomography angiography (CT-angio) confirms the diagnosis, allows for the assessment of the lesions, accurate topographic of the pseudoaneurysm and the rest of the abdomen and provide important information for therapy. CT-angio imaging can provide useful hints to differentiate a pseudoaneurysm, which is defined as a hematoma that forms as the result of a leaking hole in an artery, from the true aneurysm, which is a localized dilatation of an artery, including all the layers of the artery wall [6]. Conventionally in imaging, pseudoaneurysms most often correspond to a rounded lesion with arterial enhancement on contact with an artery. Volume rendering (VR) and maximum intensity projection (MIP) reconstructions are interesting to complete the topographic diagnosis. Currently, the CT-angio is essential since it allows the diagnosis of ruptured visceral aneurysm to be made, as well as the planning of the endovascular procedure. The information expected during this examination is manifold [8]:

- Determination of the vascular approach (femoral or humeral): analysis of the vessels.
- Description of the aneurysm: size and shape of the aneurysm, diameter of the artery affected upstream and downstream, size of the neck (if sacciform), length of the lesion (in case of placement of a stent).
- Number of related and efferent branches.
- Determination of the loco regional anatomy: analysis of the collaterals likely to reinject the aneurysm, anatomical variants, presence of other aneurysmal locations.

The estimated risk of SMA rupture is 20% to 40% [4]. If untreated, mortality can approach 100%. Associated mesenteric ischemia may occur, possibly requiring bowel resection. The available methods for the treatment of aneurysmal/pseudoaneurysmal lesions included surgical bypass and ligatures.

Conclusion:

Superior mesenteric artery (SMA) pseudoaneurysms are the rarest type of visceral artery pseudo-aneurysms. Early identification and urgent treatment are warranted because of the associated high mortality risk. With extensive use of imaging, especially in the emergency department, many more abdominal

and pelvic vascular lesions are being identified early and follow-up imaging with elective repair is occurring well before vascular rupture. Treatment options range from open operation to endoscopic and endovascular procedures.

Figure 1 : Topogram carried out before the scanner showing the presence of multiple lead shot at the thoraco-abdomino-pelvic level (black arrow)

Figure 2: Axial section of abdominal CT scan with injection of contrast product showing the presence of a pseudoaneurysm of the superior mesenteric artery (white arrow), associated with the presence of lead shot (red arrowheads)

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