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Suspected Primary Aorto-Enteric Fistula in a Patient with Gastrointestinal Bleeding and a Large Saccular Abdominal Aortic Aneurysm: A Case Report

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Abstract **Case Report**

Primary aorto-enteric fistula is a rare but potentially fatal complication of abdominal aortic aneurysms. Its clinical presentation, dominated by gastrointestinal bleeding that is sometimes intermittent, can make the diagnosis difficult, particularly when upper gastrointestinal endoscopy is normal. We report the case of a 70-year-old patient admitted for upper and lower gastrointestinal bleeding, with a normal esophagogastroduodenoscopy. CT angiography showed a large infrarenal saccular aneurysm measuring 80 × 74 mm, with wall abnormalities suggestive of aneurysmal instability, as well as a focal wall defect and peri-aneurysmal air bubbles in favor of an aorto-enteric fistula, without extravasation of contrast material into the digestive lumen. A splenic artery pseudoaneurysm was also present. This case highlights the importance of considering an aorto-enteric fistula in any unexplained gastrointestinal bleeding associated with an aortic aneurysm, even in the absence of a direct sign, and underlines the central role of imaging in diagnostic orientation and therapeutic planning.

Keywords: Primary aorto-enteric fistula, abdominal aortic aneurysm, gastrointestinal bleeding, sentinel (herald) bleed, CT angiography.

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INTRODUCTION

Primary aorto-enteric fistula is an abnormal communication between the native aorta and the digestive tract, occurring in the absence of prior aortic surgery or reconstruction. It is a rare complication of abdominal aortic aneurysms, but it can be rapidly fatal because of the risk of massive hemorrhage and infectious complications [1,2].

The third and fourth portions of the duodenum are the most frequently involved sites because of their close anatomical relationship with the abdominal aorta [1,2]. The clinical presentation is dominated by gastrointestinal bleeding, often intermittent and sometimes preceded by a moderate, spontaneously resolving bleed known as a "sentinel" (herald) bleed, which may delay the diagnosis [1,2].

The diagnosis relies on the correlation of clinical, endoscopic and radiological data. CT angiography is the reference examination in the emergency setting to characterize the aneurysm, look for signs of fistulization and assess the possibilities of vascular repair. However, failure to visualize the fistulous tract directly does not exclude the diagnosis [1,2].

We report a case of gastrointestinal bleeding associated with a large saccular abdominal aortic aneurysm and a splenic artery pseudoaneurysm, in order to underline the diagnostic difficulties and therapeutic challenges of this association.

CASE PRESENTATION

We report the case of a 70-year-old patient with no history of aortic or digestive surgery, admitted for upper and lower gastrointestinal bleeding of undetermined origin, manifesting as rectal bleeding. On admission, laboratory tests showed normochromic normocytic anemia. Esophagogastroduodenoscopy (EGD) failed to identify a bleeding source.

CT angiography showed, immediately downstream of the origin of the renal arteries, a large saccular aneurysmal dilatation containing mural thrombus. Its contours were irregular and its maximal

transverse diameters measured 80 × 74 mm. The lesion extended from the L2–L3 level to L4, over a height of 5 cm. Discontinuous, fragmented atheromatous wall calcifications were also observed (Figure 1).

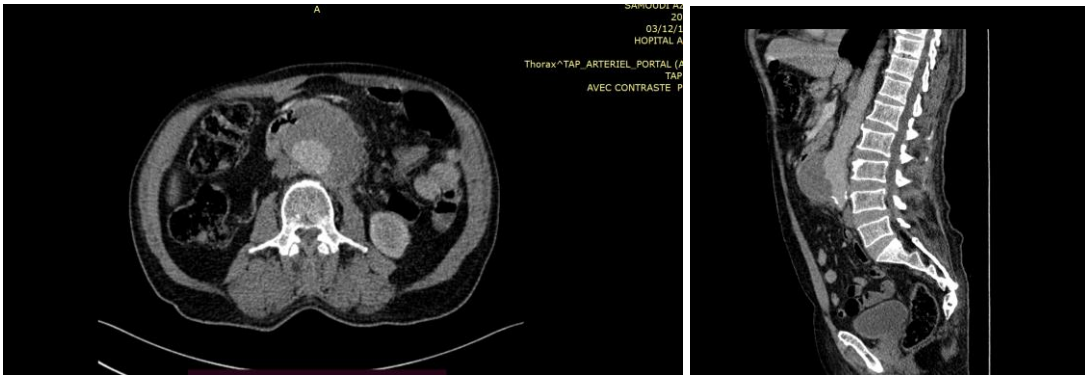


FIGURE 1: Abdominal CT angiography: large infrarenal saccular aneurysm measuring 80 × 74 mm, containing mural thrombus

The wall abnormalities comprised a 14-mm thickening interpreted as an intramural hematoma, focal irregularity of the aortic contour and discontinuity of the wall calcifications (Figure 2). No extravasation of contrast material into the digestive lumen was visible.

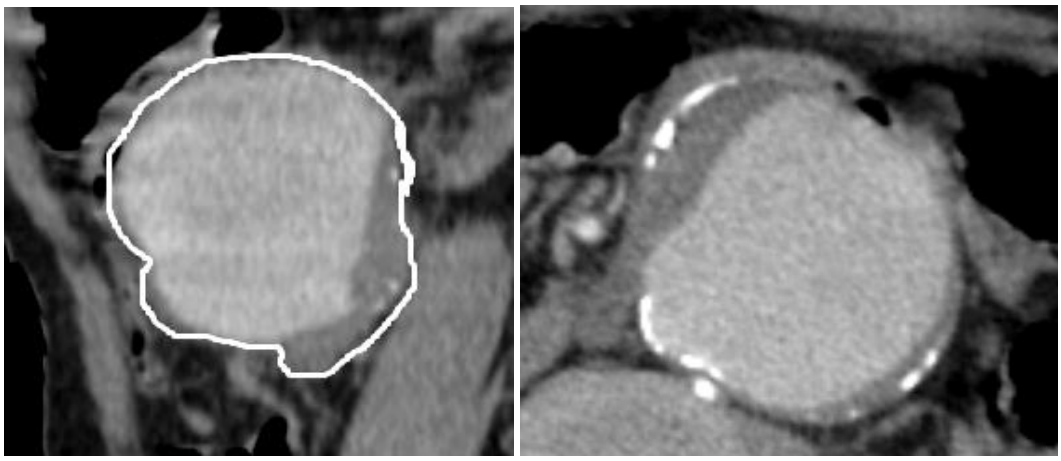


FIGURE 2: CT angiography: aneurysmal sac with an irregular wall (A) and discontinuous calcifications (B)

CT angiography also demonstrated a focal defect of the aortic wall, associated with ectopic air bubbles within the aneurysmal sac (Figure 3). The aneurysmal sac was in contact with a jejunal small-bowel loop, with loss of the fat plane. In the absence of prior aortic surgery, these abnormalities, together with the context of gastrointestinal bleeding, were highly suggestive of a primary aorto-enteric fistula, although they did not provide formal proof. Three-dimensional reconstructions of the aneurysm are shown in Figure 4.

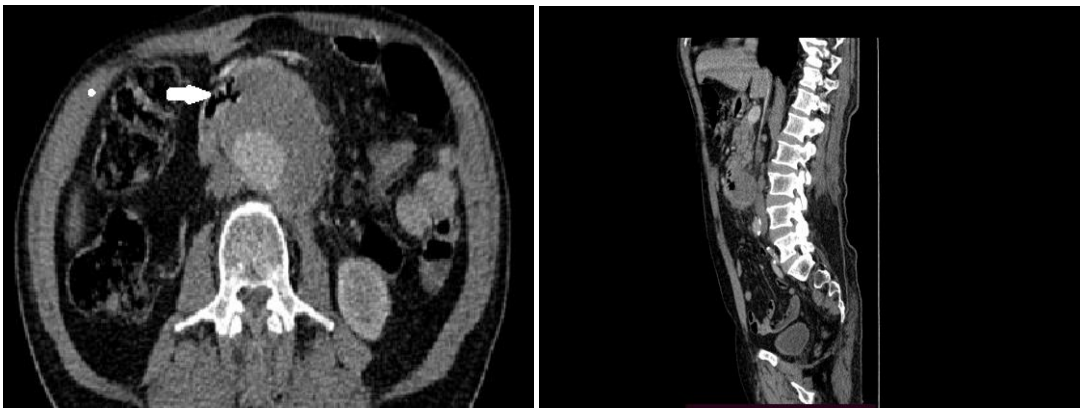


FIGURE 3: Aortic wall defect associated with peri-aneurysmal air bubbles, suggestive of an aorto-enteric fistula (white arrows)

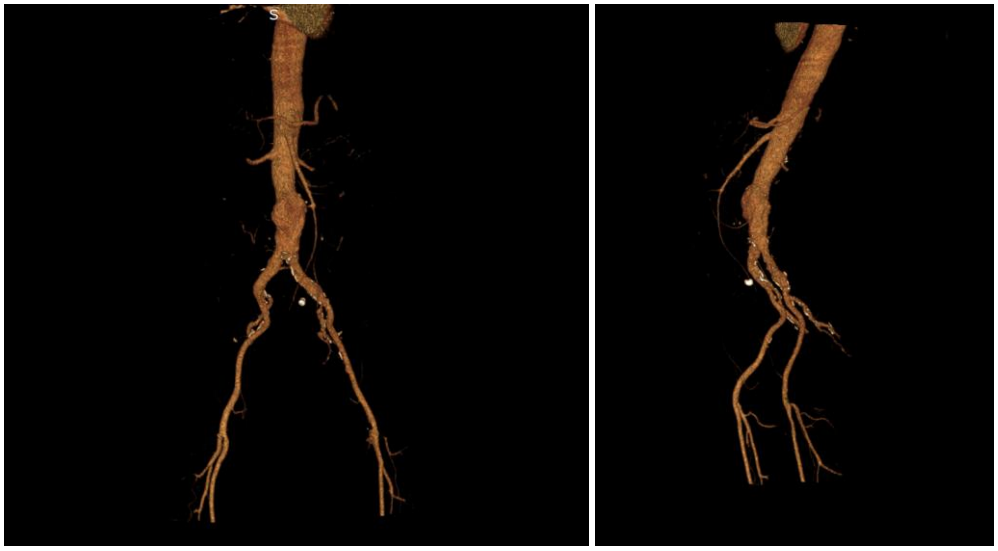


FIGURE 4: Three-dimensional reconstructions of the aneurysm

DISCUSSION

Primary aorto-enteric fistula most often occurs between the aorta and the third or fourth portion of the duodenum, whose close anatomical relationship with the anterior aspect of the aorta favors progressive erosion of the digestive wall by an expanding aneurysmal sac. Local inflammatory phenomena and chronic mechanical stress contribute to this process; infection of the aortic wall may also be the cause [1].

The clinical presentation is dominated by gastrointestinal bleeding, which may manifest as hematemesis, melena or rectal bleeding, depending on the volume of the bleed and the speed of transit. An initial moderate, spontaneously resolving bleed, known as a "herald bleed," often precedes massive hemorrhage; recognizing it offers a decisive therapeutic window [2]. The sometimes-intermittent nature of the bleeding may delay the diagnosis and explain an initially non-contributory endoscopy [1,2].

In our case, the combination of upper and lower gastrointestinal bleeding, a normal EGD and a large saccular abdominal aortic aneurysm should have prompted primary consideration of a primary aorto-enteric fistula.

Radiologically, CT angiography is the central examination to characterize the aneurysm and look for signs of fistulization. Direct signs include extravasation of contrast material into the digestive lumen or visualization of a fistulous tract, but they are rarely observed. Indirect signs are more frequent: loss of the fat plane between the aorta and the digestive tract, thickening of the adjacent bowel wall, periaortic gas, or inflammatory changes in the surrounding tissues [1,2]. In our case, the absence of contrast extravasation and of a visible fistulous tract therefore did not allow a fistula to be excluded; the wall defect and the ectopic air bubbles constituted indirect signs in its favor.

The saccular morphology of the aneurysm is an additional cause for concern. In contrast to a fusiform aneurysm, which is a circumferential dilatation of the aorta, a saccular aneurysm is characterized by a focal outpouching of the wall. Some saccular forms may be associated with a particular underlying wall disease, notably infectious or inflammatory, and require specific evaluation. However, the risk of rupture cannot be determined from morphology alone. In our case, the maximal diameter of 80 mm, together with the wall abnormalities, was a major argument in favor of a high-risk lesion requiring urgent management [3].

Analysis of the aortic wall also looks for signs of complication, in particular intramural hematoma, focal deformation of the outer contour and interruption of the wall calcifications. Intramural hematoma is an accumulation of blood within the aortic wall, usually seen on non-contrast acquisitions as spontaneous hyperdense thickening. Within an aneurysm, a spontaneously hyperdense crescent in the thrombus or wall (the "hyperdense crescent sign") is a classic sign of impending rupture. In our case, the 14-mm wall thickening, interpreted as an intramural hematoma, had to be weighed against the other morphological abnormalities and the clinical data. The irregularity of the outer contour and the discontinuity of the calcifications could also reinforce the suspicion of wall fragility. However, these signs should not be considered in isolation as certain proof of impending rupture, as their interpretation requires an overall radiological analysis.

The radiological differential diagnosis includes other causes of acute hematoma or remodeling of the aortic wall, such as aortic dissection and penetrating atherosclerotic ulcer. Analysis of the non-contrast and post-contrast acquisitions allows one to look for an intimal flap, an ulceration penetrating the media or an abnormality of wall enhancement. Distinguishing a primary aorto-enteric fistula from a contained rupture and from a simple inflammatory apposition between the

aorta and the digestive tract is also essential. Correlation between the radiological signs, the clinical presentation and the operative findings, when available, remains decisive [1,3].

Finally, the combination of a saccular aneurysm, periaortic air bubbles and wall abnormalities should raise the possibility of an infected ("mycotic") aneurysm, which may itself be complicated by digestive fistulization. Looking for fever and a biological inflammatory syndrome and obtaining blood cultures are then indispensable.

The management of a suspected aorto-enteric fistula relies on an urgent multidisciplinary strategy involving vascular surgery, interventional radiology, anesthesia–intensive care and gastroenterology. Treatment must control the hemorrhage, secure the aortic lesion and, when a fistula is confirmed, address the digestive communication and the associated infectious risk. The choice between open surgical repair and an endovascular approach depends on the vascular anatomy, the clinical condition and the available resources. When the location of the aneurysm does not allow conventional proximal anchoring without compromising perfusion of a major visceral branch, complex endovascular repair or open surgery may be necessary. The European guidelines on aorto-iliac aneurysms emphasize the importance of anatomical assessment and of adapting the repair strategy to the characteristics of each lesion [3]. The prognosis of primary aorto-enteric fistula remains guarded because of the risk of massive hemorrhage, the possibility of diagnostic delay and infectious complications. Outcome depends in particular on the speed of diagnosis, control of the bleeding, management of the aortic lesion and the possible presence of an associated infection. Appropriate clinical and radiological surveillance is also required after treatment to detect vascular, infectious or hemorrhagic complications.

CONCLUSION

Primary aorto-enteric fistula is a rare but potentially fatal complication of abdominal aortic aneurysm. In the setting of unexplained gastrointestinal bleeding associated with a large aneurysm and wall abnormalities, this diagnosis should be considered promptly, even when EGD and CT angiography show no direct communication. CT angiography plays a central role in analyzing the aortic wall, looking for indirect signs of fistulization and planning treatment.

ADDITIONAL INFORMATION

Conflict of interest: The authors declare that they have no conflicts of interest.

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