

A Rare Association of a Ruptured Middle Colic Artery Giant Aneurysm and A Celiac Artery Dissection - A Case Report and Literature Review

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1. Abstract

The occurrence of rupture is the worst among the circumstances of the discovery of a Superior Mesenteric Artery (SMA) branch aneurysm. Despite it remains a rare event, many cases have been reported in the literature. The occurrence correlation of a pancreaticoduodenal aneurysm with isolated celiac artery injury has been proven. However, the association of the middle colic artery aneurysm with an isolated dissection of the celiac artery was never reported. We report the case a 60-year-old woman consulted for acute abdominal pain. The Computed Tomography (CT) angiography revealed, in addition to a spontaneous rupture of a giant aneurysm of the Middle Colic Artery (MCA), a dissection of the celiac trunk that is yet more exceptional event. The patient underwent a critical operation, urgently for his aneurysm. No postoperative complications occurred in the follow-up.

2. Introduction

The aneurysm of a branch of the SMA is a rare and little-known entity. The prevalence documented in the literature is from 0.1 to 0.2% [1]. The MCA is the second branch affected after the jejunal artery that incidence estimated at 0, 28% [2]. The big fear is the occurrence of a rupture, which is a very exceptional cause of an acute intra-abdominal hemorrhage that can occasionally be fatal. Only a few cases of celiac artery dissection without concomitant aortic dissection have been reported in the literature. The association between the two entities is a very exceptional event, with an unknown incidence. The purpose of this article is to discuss thoughts to the eventual relationship between these two extremely

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rare entities, as well as to review their clinic and radiologic appearances and to discuss the different therapeutic modalities.

3. Observation

A 60-year-old woman consulted in the emergency room for isolated acute epigastric stabbing pain. Her medical history included high blood pressure and dyslipidemia. However, she hasn't any history of cardiac disease or taking an anticoagulant. According to family, this abdominal pain had occurred several days before and which slowly got worse. It was firstly in the epigastrium, and then it has spread towards abdomen with nausea and vomiting.

In the emergency room, the patient has a stable hemodynamic status. Her blood pressure was 14/60 mmHg, and his pulse rate was 90 beats per minute. On the physical examination, there was diffuse abdominal tenderness predominant in the epigastrium, but she hasn't a fever, peritoneal signs, or jaundice. Blood analysis found elevated white blood cell count (12600/ elements/mm³). Serum amylase, lipase, and other routine blood analysis were within reference limits. The abdominal radiogram showed a nonspecific gas pattern. In front of this patient's condition, intestinal ischemia was highly suspected by surgeons, so an abdominal CT scan was performed.

The abdominal CT angiography detected a round-shaped mass mimicking a vascular structure coming into contact with mesenteric vessels. This mass was approximately 37 mm in diameter. It showed enhancement kinetics synchronously to the opacification of the mesenteric artery with intense contrast uptake dice the arterial phase. Besides, there was a parietal hematoma surrounding

this mass and spreading out into the peri-pancreatic space. 3D reconstructions images have shown readily that this formation was a saccular aneurysm of the middle colic artery (Figure 1A, 1B, 1C). However, there were no specific signs for small bowel ischemia or free intraperitoneal fluid in CT.

Other than this aneurysm, CT detected a flap intimal in the celiac trunk lumen without mural thrombus or extension into celiac branches (Figure 2). However, the abdominal aorta was normal. There are no visceral suffering signs. The diagnosis of a ruptured aneurysm of MCA associated with spontaneous celiac artery dissection without visceral repercussions has been retained. So, the patient transferred to a cardiovascular surgery department. Mesenteric angiography has been requested for potential endovascular management. But finally, because of a sudden deterioration of the patient's hemodynamic constants, the surgery has preferred than endovascular therapy. Intraoperatively, the exploration confirmed the CT findings. There was a giant aneurysm more than 35 mm in the lower third of the MCA, which was associated with a peri-aneurysmal hematoma. However, no other anomaly was found, especially no signs of suffering intestinal small bowels or peritonitis irritation. An aneurysmectomy with patch closure using an autologous vein. At the immediate, the bleeding ceased and hemodynamic parameters have stabilized.

The patient has remained in the intensive care department under follow-up for her artery celiac dissection. During the six months of follow-up, no operative complications have occurred, and she was clinically well. No specific lesion has been identified in the histopathologic examination of the resected specimen, as well as, the bacteriological exam was negative.



Figure 1: Axial abdominal computed tomography scan with contrast injection showing

Figure 1A: A giant saccular aneurysm of a branch of the superior mesenteric artery

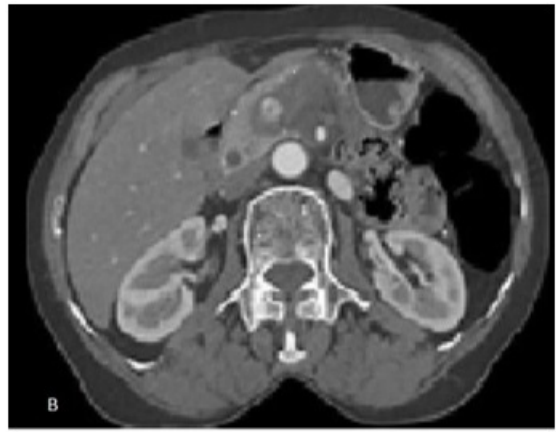


Figure 1B: There was a hematoma surrounding this mass and spreading out into the peri-pancreatic space

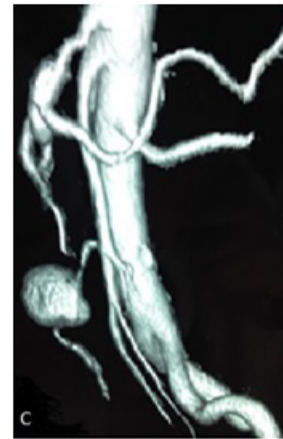


Figure 1C: Volume rendering reconstruction showing a true aneurysm of a middle colic artery



Figure 2: Axial abdominal computed tomography scan with contrast injection showing a flap intimal in the celiac trunk lumen, in contrast, the abdominal aorta was normal

4. Discussion

Aneurysms of the SMA and its branches are the third most prevalent in the splanchnic tracts after aneurysms of the splenic and hepatic arteries. These of the inferior mesenteric sector are even the least frequent, only 40-50 cases have been reported [3]. Among them, this of MCA, which incidence remains yet unknown [4]. They are often accidentally discovered during an abdominal imaging exam. As they are associated with the risk of rupture and Hemorrhage, they are considered a potentially catastrophic condition.

The spontaneous celiac artery dissection without aortic involvement is extremely rare. It was about five times less frequent than SMA dissection. Its pathogenesis remains to be clarified; it has been suggested to be associated with atherosclerosis and hypertension [5].

The mainly uncommon in our observation is the synchronous presence of aneurysm of MCA and isolated celiac trunk dissection, itself an entity exceptionally encountered. Indeed, the majority of previous publications reported an association of pancreaticoduodenal artery aneurysm with a celiac artery stenosis or occlusion that is commonly related to atherosclerotic disease, a median arcuate ligament syndrome, or a congenital absence of celiac artery [6]. However, its association with a celiac artery dissection was an extremely rare event, only 2 cases with a ruptured pancreaticoduodenal aneurysm associated with celiac artery dissection have been reported [7]. To the best of our knowledge, only one case of association of an aneurysm of the middle colic artery with an isolated dissection of the superior mesenteric artery has been reported but no case of association with the celiac artery dissection [8].

The pathogenesis of these aneurysms remains a subject of controversy. Several factors have been implicated. It has been reported that 50% of aneurysms of the inferior mesenteric sector are related to occlusion of the SMA or Celiac artery [3].

A rational explanation has been suggested for this coexistence, is that the lesion of the celiac artery causes disrupts and hemodynamic changes of blood flow in the mesenteric tract [6]. The persistently elevated blood flow through the pancreaticoduodenal arcade, causing later the weaken and fragilization of arteries that leading to aneurysms. Therefore, we think that the same hypothesis can be retained regarding the MCA aneurysm.

There are no specific symptoms attributable to the aneurysm of MCA. If complicated, the most frequent and earlier symptom is a pain ranging from slight abdominal pain to excruciating pain. Taking into consideration rupture risk, even are asymptomatic, treatment is recommended.

The occurrence of a rupture is the worst and the most frequently discovering circumstances (90% of cases). It can be complicated by cataclysmic internal Hemorrhage, which can be fatal with

a case fatality ratio of 25 to 70% [1]. This risk is, correlated with aneurysm size, shape, and location. It seems to occur with a false aneurysm than a true aneurysm [9]. Most cases reported with a ruptured aneurysm of MCA have an aneurysm size of less than 1cm. In Our observation aneurysmsize was giant (35mm) [3]. Despite is not common, but it should be kept in mind, the occurrence possibility of other complications such as occlusion of small arteries by embolism of the blood clot in the aneurysm that can lead to serious gastrointestinal complications including necrosis. The most useful imaging modality for diagnosis is the computed tomography angiography. It allows noninvasive evaluation of the splanchnic vessels. It can detect the aneurysm any their number and the concerned arterial branches. The three-dimensional reconstruction with Multiplanar Reformation (MPR) images has a fundamental interest in this area. Despite the approved value of CT, the crucial tool of exploration remains the arteriography, which adds to his role in diagnosis, its ability to provide a therapeutic gest [10].

Numerous methods and tools for the management of splanchnic arteries aneurysms have been used. Concerning MCA aneurysms, the decision of endovascular or surgical management is guided by the clinical patient condition, when it is unstable, surgery is preferred. Already the most common therapeutic strategy reported in the literature was open surgery. The classic surgical option includes the ligation of the aneurysm with or without resection. In the last years, the modality of endovascular management has arisen as an alternative for open surgery. Naito et al reported firstly successful endovascular treatment for the middle colic artery aneurysm [11]. After, there have been reported cases with success or failure of endovascular treatment. Recently, a hybrid procedure is proposed, it is a combination of exclusion, and bypass the aneurysm with coil embolization [6].

Concerned the celiac artery dissection, most studies favoring conservative management. Strict pressure control and anticoagulation for the prevention of thromboembolic complications seem to be sufficient. Surgery and endovascular procedures are indicated when medical therapy fails to control blood pressure, and when dissection is processing. It was demonstrated that celiac artery dissection and its branches rarely lead to severe ischemic complications because the organs are usually revascularized by sufficient collateral flow [5]. Although recent literature suggests favorable outcomes after medical treatment of celiac artery dissections, there weren't exhaustive researches about complications in the long run. As, well as their not innocent association with often ruptured aneurysms of splanchnic arteries that are more and more reported. It may be that is the time to draw attention to this entity to change the care procedures.

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