Idiopathic spontaneous haemoperitoneum due to a ruptured middle colic artery aneurysm

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ABSTRACT

INTRODUCTION: Idiopathic spontaneous intra-abdominal haemorrhage is a rare, but challenging condition, associated with high mortality if not managed appropriately. The preoperative diagnosis is difficult, despite the recent advances in imaging. We present the clinical manifestations of this condition, as well as the available diagnostic and therapeutic modalities.

PRESENTATION OF CASE: We report a case of a spontaneously ruptured dissecting aneurysm of the middle colic artery, which was managed with an emergency laparotomy and aneurysmectomy. Interestingly, no evidence of vasculitis, infection or collagen disease was discovered during the histopathology examination of the specimen.

DISCUSSION: The treatment of idiopathic spontaneous intra-abdominal haemorrhage revolves around patient resuscitation and management of the source of bleeding. In case of a ruptured aneurysm of the middle colic artery, the surgical management includes emergency laparotomy, arterial ligation and resection of the aneurysm. Transarterial embolisation has been suggested as a safe and less invasive alternative approach.

CONCLUSION: A ruptured middle colic artery aneurysm should be included in the differential diagnosis of any unexplained intra-abdominal haemorrhage. Aneurysmectomy is the treatment of choice, with radiologic interventional techniques gaining ground in the management of this entity.

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1. Introduction

Idiopathic spontaneous intra-abdominal haemorrhage (ISIH) is a rare, but potentially life threatening surgical emergency that has been traditionally referred to as abdominal apoplexy. Rupture of a visceral artery aneurysm is a well documented, although rare cause of ISIH, with a variable, but rather predictable clinical presentation. The preoperative diagnosis remains challenging, despite the recent radiologic advances and surgical exploration is often unavoidable for the diagnosis and treatment.

We report a case of idiopathic spontaneous haemoperitoneum caused by a ruptured aneurysm of the middle colic artery.

2. Presentation of case

A 63-year-old male patient presented to our emergency department with severe, dull epigastric pain of acute onset. The pain was intermittent, radiating to the back and was associated with nausea. The patient denied any recent trauma, mentioning however that he was straining few hours before the pain occurred, while lifting weights. His past medical history included a left inguinal hernia repair and haemorrhoidal disease, but no hypertension or connective tissue disorder.

On admission, he was haemodynamically stable with a blood pressure of 160/90 mm Hg and a pulse rate of 80/min and he was apyrexial. On examination, his abdomen was soft and non-distended, with normal bowel sounds. Some mild tenderness was diffusely present on deep palpation, but there was no guarding or rebound tenderness.

The blood results showed an elevated white cell count of 15.3 × 10⁹/l with neutrophilia and a low haemoglobin of 10.1 g/dl. The clotting screen, platelets, U&E, LFTs, and amylase were within normal limits and the urine dipstick results were unremarkable. His plain abdominal radiography only showed a nonspecific bowel gas pattern and an abdominal ultrasound scan was performed proving negative for renal calculi, hydronephrosis or gallstone disease.

We decided to investigate further with a Computerized Tomography scan of the patient’s abdomen and pelvis, which revealed a high-density intraperitoneal fluid collection consistent with a
haematoma, lying adjacent to the pylorus of the stomach, gallbladder, and right anterior pararenal area. An amount of mixed-density perihepatic and perisplenic fluid consistent with blood was also evident and tracked bilaterally along the paracolic gutter to the pelvis, but no free air or specific vascular abnormality was noted.

The patient remained haemodynamically stable and was submitted to an emergency Magnetic Resonance Angiography to detect the source of bleeding. The scan showed no evidence of an abdominal aortic aneurysm, and the coeliac, splenic, hepatic, renal, superior mesenteric and gastroduodenal arteries were reported as normal. The portal system was likewise normal.

A conservative approach with fluid resuscitation and intravenous analgesia was decided, and the patient’s symptoms initially subsided. However, twenty-four hours after his admission, his pain recurred and he developed hypotension, tachycardia, and dizziness. His repeat haemoglobin was 8.3 g/dl, and it was decided to proceed with an urgent exploratory laparotomy with simultaneous transfusion of packed red cells.

During the laparotomy, approximately 1.5 l of free blood and clots were found in the abdomen and a large haematoma involving the root of the transverse mesocolon was prominent. The haematoma was associated with a ruptured middle colic artery aneurysm measuring approximately 0.7 × 1 cm (Figs. 1 and 2), which was ligated and excised without a colectomy, since the blood supply to the transverse colon had not been compromised.

The histopathology examination revealed a ruptured dissecting aneurysm of the middle colic artery and clot formation within the tunica media. There were no specific findings of arteriosclerosis, infection or underlying collagen disease (Fig. 3). The part of the middle colic vein included in the specimen was unremarkable.

The patient’s postoperative course was uneventful and he was discharged on the 8th postoperative day. After 14 months of follow-up he remains asymptomatic and well in his health.

3. Discussion

Idiopathic spontaneous intra-abdominal haemorrhage is a rare syndrome associated with high mortality.1 The term is synonymous with the more recent ‘abdominal apoplexy’ that has traditionally used to describe cases of intra-abdominal bleeding that are not a consequence of numerous well-documented causes such as trauma, pregnancy, vasculitis, malignancy, or inflammatory processes (e.g. pancreatitis).1 Considering that colic artery aneurysms represent approximately 0.28% of all superior mesenteric aneurysms, rupture of a middle colic artery aneurysm is a particularly rare cause of abdominal apoplexy, with only 35 cases reported prior to our case.6,7

The majority of visceral aneurysms probably arise from a congenital abnormality in the tunica media which may be further stressed by various acquired factors,8 with arteriosclerosis and hypertension being amongst the most well-documented ones.1 Inflammation of the arterial wall, because of polyarteritis nodosa and other vasculitis, mycotic and bacterial infections, trauma, as well as expansion of inflammatory processes of adjacent tissues like for example in pancreatitis, are well known causes.8 In the case we report, none of the above causes has been identified in the patient’s history, clinical examination, biochemical results, imaging investigations, intraoperative findings or subsequent histopathology report.

The presentation of a ruptured middle colic artery aneurysm is variable, with intermittent or constant abdominal pain being the most commonly encountered presenting symptom.4,9,10 It can be diffuse or localized to the upper abdomen9 and it is usually caused
by the pressure of a rapidly expanding haematoma on adjacent structures or from bowel ischemia due to hypoperfusion. At a later stage, hypotension and other manifestations of hypovolemic shock may become apparent. The duration of symptoms is usually short, however a number of patients mention a longer history of vague abdominal pain, evident up to six months before presentation. Similarly to our case, rupture of the aneurysm and intra-abdominal haemorrhage is often preceded by strain. As in the described case, leukocytosis is frequently encountered on the patient’s blood tests, it is however non-specific.

The diagnosis of middle colic artery aneurysms is difficult, and despite the recent radiological advances, the rarity of this process and lack of suspicion contribute to a diagnostic delay. Physical examination is rarely helpful, and plain abdominal radiography is of little value since arterial calcification is not commonly present. Computerized Tomography is valuable in cases of aneurysms larger than 7 mm, and the authors consider it important for the differential diagnosis of this condition in the vast majority of stable patients. Helical Computerized Tomography is particularly useful as it can detect smaller vascular lesions. Angiography has been suggested as the gold standard for diagnosing and localizing these lesions, allowing an evaluation of collateral blood flow in case of obstruction of major splanchic arteries, providing helpful information in the decision for bowel resection, and facilitating surgical exploration. Intraoperative angiography has also been suggested by McNamara and Griska. Other complementary modalities like Magnetic Resonance Angiography, Doppler Ultrasonography and F.A.S.T. ultrasound, as well as Diagnostic Peritoneal Lavage have an unproven diagnostic role in this condition.

The treatment of idiopathic spontaneous intra-abdominal haemorrhage revolves around patient resuscitation and management of the source of bleeding. In case of a ruptured aneurysm of the middle colic artery, the surgical management includes emergency laparotomy, arterial ligation and resection of the aneurysm. Moreover, intraoperative exploration for additional superior mesenteric branch aneurysms has been suggested, and bowel resection is indicated for intramural aneurysms or if the intestinal blood supply has been compromised. Although mortality is minimum after a successful aneurysmectomy, it may reach 40% in cases of non-therapeutic exploration.

Transarterial embolisation has lately been suggested as a safe and less invasive alternative approach, with a variety of materials available for embolisation of mesenteric branch aneurysms. The risk of bowel infarction may however limit the application of this method in the management of middle colic artery aneurysms, and potential complications include segmental intestinal necrosis, stricture or perforation, as well as aneurysm rupture.

4. Conclusion

A high level of awareness is required, and this condition needs to be included in the differential diagnosis of any difficult to explain intra-abdominal bleeding. As with any acute blood loss, it constitutes a challenge for every surgeon, however, knowledge of the common causes of spontaneous intraperitoneal bleeding is important to allow for a rapid and thorough intraoperative assessment, facing a high mortality rate in case of an unsuccessful intervention.

Author contributions

Christos Skouras contributed to the writing, study design, data collection, literature review, Miltiadis Lalounias to data collection, manuscript editing, and literature review, Apostolos Triantafyllou to literature review, manuscript editing, and data collection, Stamatia Angelidou to specialist pathology support, data collection and Konstantinos Ballas to study design, manuscript editing and supervision.

Conflict of interest statement

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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