Successful coil embolization of ruptured middle colic artery aneurysm: a case report

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ABSTRACT We describe a case in which transcatheter arterial embolization (TAE) for a ruptured middle colic artery aneurysm (MCA-A) was successfully performed. A 51-year-old woman with a history of alcoholic liver dysfunction was transferred to our hospital with severe abdominal pain, diarrhea, and vomiting that had developed one week before admission. On arrival, the patient was pale, and showed significant peripheral coldness, tachycardia, and abdominal distension. The white blood cell count was 11,700/mm³ and the hematocrit value was 15.1%. Abdominal computed tomography (CT) with contrast enhancement revealed an aneurysm in the MCA and marked fluid collection. With a diagnosis of ruptured MCA-A, TAE was emergently performed. Arteriography of the superior mesenteric artery demonstrated an aneurysm of 8 mm in diameter in the MCA. TAE was successfully performed. Persistent fever occurred from the 18th hospital day, and a remaining intramural hematoama detected on follow-up CT was thought to be its cause. Drainage was performed on the 23rd hospital day. The patient was subsequently discharged on the 39th hospital day. In conclusion, detailed CT examination is helpful for a diagnosis of MCA-A, and TAE is effective in the treatment of a ruptured MCA-A.

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Introduction

Although splanchic artery aneurysms have been considered to be relatively rare lesions, owing to recent advances in imaging modalities such as computed tomography (CT) and angiography, the diagnostic rate of these aneurysms has increased. Most splanchic artery aneurysms are asymptomatic. Rupture of these aneurysms, however, may be life-threatening. About 60% of them are splenic artery aneurysms, 20% hepatic artery aneurysms, and 20% occur at other locations ³. Although case reports on middle colic artery aneurysms (MCA-A) are increasing, the management of such lesions remains controversial.

We present the case of a ruptured MCA-A successfully treated by TAE.

Case

A 51-year-old woman who presented with severe abdominal pain, watery diarrhea, and vomiting of 7 days duration was transferred to our emergency department. The patient had a past medical history of alcoholic liver dysfunction and right anterior cruciate ligament injury. Upon arrival, her blood pressure was 111/61 mmHg, heart rate 132/min, and body temperature 36.6°C. The patient was pale and showed severe peripheral coldness. Her abdomen was significantly distended, with mild guarding.

Investigations revealed the following: hemoglobin, 5.1 g/dl; white blood cell count, 11,700/mm³; aspartate aminotransferase (AST), 78 IU/l; alanine aminotransferase (ALT), 89 IU/l; blood urea nitrogen, 27 mg/dl; and serum creatinine, 3.3 mg/dl. Serum amylase was not elevated (112 U/l, normal<150 IU/l). Electrolytes and urinalysis were

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within normal ranges. Blood gas analysis revealed severe metabolic acidosis, with a -15.5 mmol/l base excess.

An abdominal CT with contrast enhancement demonstrated an aneurysm measuring 4 mm in diameter in the left upper abdomen. Further CT examination including sagittal and coronal planes with thin slices disclosed that the aneurysm was saccular and originated from the middle colic artery (MCA) (Fig. 1). An irregular mass measuring approximately 5 × 11 cm in diameter extended both cranially and caudally from the aneurysm. The mass was located ventral to the pancreas and left kidney. Bloody ascites was continuously noted from the subphrenic space to the pouch of Douglas. The pancreas showed a normal size and density. A small amount of left pleural effusion was detected.

With a diagnosis of ruptured MCA-A, the patient underwent emergent angiography. An aneurysm measuring 8 mm in diameter was identified in the proximal portion of the MCA on selective superior mesenteric arteriography (Fig. 2). Contrast material extravasation was not observed. TAE was performed with ten coils (Trufill pushable coil, Cordis, Johnson and Johnson, 3 mm × 2 cm:1, 4 mm × 3 cm:2, 5 mm × 4 cm:2, and 6 mm × 5 cm:5). Using isolation and packing procedures, the MCA-A and just distal and proximal to the aneurysm were continuously embolized (Fig. 3). Arteriography confirmed that the aneurysm was completely excluded and the distal bed of the MCA was perfused by both the left and right colic arteries.

After the procedure, the patient still had anemia requiring transfusion, while a low output of urine resulting from renal dysfunction was noted. Considering the serum level of potassium, continuous hemodialfiltration (CHDF) was instituted. The patient was transfused with 8 packs of pure red cells in total, and CHDF was continued for 10 hours. Hemoglobin and serum creatinine levels returned to 9.8 g/dl and 2.1 mg/dl, respectively. Moreover, the urinary output significantly increased and the serum level of potassium remained unchanged.

Although her abdominal symptoms gradually resolved and no symptoms suggesting bowel ischemia were evident, pancreatic and biliary enzymes were mildly elevated, and persistent fever around 38 ℃ was noted from the 18th hospital day. Abdominal CT disclosed a capsulated homogenous mass suggesting a remaining hematoma. A 12Fr drainage catheter was transcutaneously positioned from the left lateral abdominal wall under ultrasonographic guidance, and serous old bloody fluid was obtained. Culturing revealed that the fluid was sterile, and the catheter was removed 12 days after insertion.

The patient subsequently recovered, and the clinical data normalized. The patient was discharged on the 39th hospital day without any complications.

Discussion

Although relatively rare, splanchnic artery aneurysms are well-recognized in the literature.
Of all splanchnic artery aneurysms, the splenic artery is the most commonly involved (approximately 60%), followed by the hepatic (20%), superior mesenteric (5.5%), celiac (4%), and gastric and gastroepiploic (2%) arteries, jejunal, ileal, colic (3%), and pancreaticoduodenal and pancreatic (2%) arteries, gastrroduodenal artery (1.5%), and inferior mesenteric artery (<1%) \(^1\).

The etiology of splanchnic artery aneurysms depends upon their location. In the splenic artery, atherosclerosis, portal hypertension, pregnancy, infection, and pancreatitis are mainly described as causes of aneurysms \(^2\). In the hepatic artery, trauma, atherosclerosis, inflammation, and mycosis have been reported, while iatrogenic factors related to surgical or percutaneous biliary procedures are increasing \(^3\). Segmental arterial mediolysis has also been focused on as a cause of splanchnic artery aneurysm, which is an entity of non-inflammatory or non-atherosclerotic conditions characterized by causing intraabdominal hemorrhage \(^4,5\). Regarding the MCA, atherosclerosis, polyarteritis nodosa, fibrodysplasia, mycosis, rheumatoid arthritis, Marfan’s syndrome, and segmental arterial mediolysis have been described as causes of aneurysms \(^6-8\).

Although a histopathological study was not conducted in the present case, infection or trauma was unlikely to be a cause of the aneurysm considering her medical history. She did not have any past history suggesting autoimmune or systemic connective tissue diseases. Although her medical history of alcoholic abuse may suggest that the aneurysm was associated with chronic pancreatitis, the serum amylase level was within the normal range and no changes such as pancreatic ductal dilatation, atrophy, or calcification were apparent on abdominal CT.

Independent of the etiology, the natural clinical course of most splanchnic artery aneurysms appears to be expandable, and they eventually rupture, resulting in a life-threatening situation \(^9\).

Non-ruptured splanchnic artery aneurysms are rarely symptomatic; thus these aneurysms are identified as incidental findings on diagnostic studies undertaken for other purposes \(^3\). Ruptured aneurysms, on the other hand, commonly lead to abdominal pain resulting from an expanding hematoma and bowel ischemia \(^9\).

In our patient, the timing of aneurysm rupture was uncertain. Although a series of abdominal symptoms including abdominal pain, watery diarrhea, and vomiting developed 1 week before admission, her general condition was mostly stable. The abdominal pain and distension rapidly advanced, and acute progressive anemia was noted on the admission day. This may suggest that localized rupture of the aneurysm had resulted in free intraabdominal rupture.

Abdominal CT with contrast enhancement is likely to be helpful for the diagnosis of ruptured splanchnic artery aneurysm \(^9\). In our case, although acute pancreatitis was initially suspected because of her clinical symptoms, thin
slice CT examination including sagittal and coronal sections led us to establish a precise and rapid diagnosis. Angiography may also be the optimal way to localize the aneurysms in hemodynamically stable patients 8).

Once a diagnosis of ruptured splanchnic artery aneurysm is established, therapy should be considered immediately, since the mortality rate is quite high 11,12).

The management of ruptured splanchnic artery aneurysms includes surgical intervention and TAE. Surgical intervention involves aneurysmal resection, ligation, and bowel resection 12). Patients with ruptured splanchnic artery aneurysms, however, may be at a greater risk regarding surgical approaches because of their poor conditions.

Instead of surgery, TAE has recently been widely recommended as a safe and less invasive approach for ruptured splanchnic artery aneurysms 3,9,13,14). TAE provides several advantages including the precise localization of the aneurysm, assessment of collateral flow, easy approach to aneurysms, and low recurrence 10). Surgical treatment, however, should still be considered when bowel necrosis or perforation is clinically suspected. Aneurysmal rupture during embolization was reported as a complication of TAE 15). Surgical intervention should also be chosen immediately in such a situation.

In TAE for splanchnic artery aneurysms, several complications were reported. Aneurysmal rupture, bowel ischemia, splenic infarction or abscess, and the recanalization of aneurysms have been described in the literature 2,12,13,16). In our case, both isolation and packing procedures were employed to completely exclude the aneurysm. We confirmed that distal perfusion of the aneurysm was maintained by another arterial blood supply route during the procedure. Although pancreatic and biliary enzymes were transiently elevated after the procedure, no symptoms or signs suggesting intraabdominal complications were observed.

In conclusion, careful CT examination is helpful to diagnose splanchnic artery aneurysms including MCA-A. TAE is thought to be a treatment of choice, but a surgical approach should be considered immediately when TAE is unsuccessful.

References


症例報告

中結腸動脈瘤破裂に対しコイル塞栓術を施行した1例

篠橋 望1  金子 一郎1  大矢 浩史1  香村 安健1
織木 崇1  西村 翔1  荒木 則雄2

要旨 中結腸動脈瘤の破裂に対して緊急コイル塞栓術を施行し良好な結果を得たので報告する。症例はアルコー
ル性肝障害の既往を有する51歳女性で、1週間前から腹痛、下痢、嘔吐が出現した。来院時顔面蒼白、顕著な末
梢冷感あり、頻脈ならびに腹部膨満を認めた。白血球 11,700/mm³、Ht15.1% であった。腹部造影 CT にて中結腸
動脈瘤ならびに液体貯留を認めた。中結腸動脈瘤破裂の診断にて、緊急コイル塞栓術を施行した。上腸間膜動脈
造影にて中結腸動脈に径8mmの動脈瘤を認めた。コイルを留置し血流遮断を確認した。入院18日目より持続す
る発熱を認め、follow up CTにて発熱の原因と考えられる血腫の残存が判明した。入院23日目に経皮的ドレナージ
を施行した。以降の経過は良好で入院39日目に退院した。中結腸動脈瘤の診断には詳細なCT検査が有益であ
る。動脈瘤破裂に対して経カテーテル的コイル塞栓術は有用な治療法である。
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