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Case Report

Radiology Section

Successful Management of Angiodysplasia of Colon by Transarterial Embolisation: A Case Report

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ABSTRACT

Angiodysplasia is a common cause of lower Gastrointestinal (GI) bleeding, particularly in elderly patients. It can range from asymptomatic or occult bleeding to moderate or severe bleeding that leads to haemodynamic instability. The diagnosis of angiodysplasia should be considered among the differential diagnosis in cases of intermittent GI bleeding when no other significant cause is identified. Various treatment modalities are described for management; among them, endovascular management with embolisation is one of the most effective and safe approaches, especially in high surgical risk patients. Hereby, authors present present a case of splenic flexure colon angiodysplasia in 54-year-old male patient, that led to haemodynamic compromise, which was successfully treated via minimally invasive transarterial endovascular embolisation without the need for surgical intervention. In haemodynamically unstable patients, angiography is a suitable approach because it not only demonstrates bleeding points but also offers a minimally invasive therapeutic endovascular intervention in the same sitting.

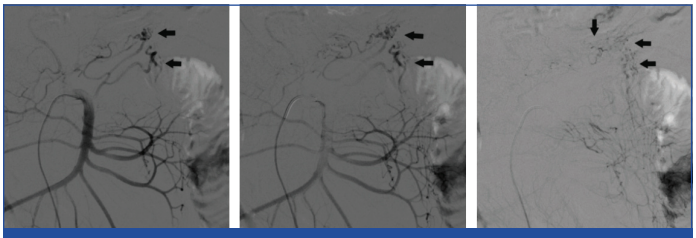
Keywords: Catheter, Gastrointestinal haemorrhage, Vascular malformations

CASE REPORT

A 54-year-old hypertensive male patient, with complaints of intermittent rectal bleeding for the past three days, presented to the Emergency Department in a state of haemodynamic instability. His vital signs at presentation were a pulse of 108 beats per minute (bpm), blood pressure of 90/60 mmHg on ionotropic support, and SpO_2 greater than 95%. He had no other co-morbidities and no significant surgical history.

The patient underwent an urgent colonoscopy, which revealed blood clots in the descending and sigmoid colon, as well as, active blood oozing from the splenic flexure. Due to his haemodynamic instability, the patient was transferred to the catheterisation laboratory for urgent transarterial mesenteric angiography.

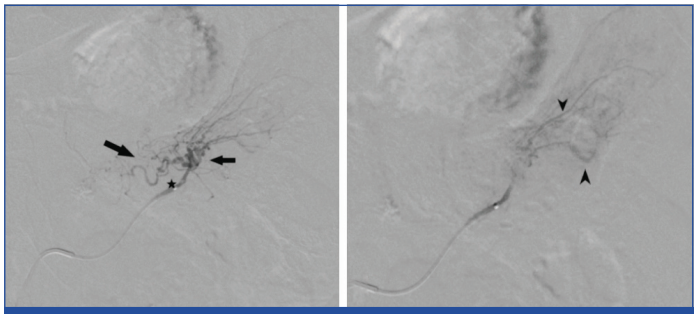
Under local anaesthesia and ultrasound guidance, a 5F right common femoral arterial access was obtained. The superior mesenteric artery was cannulated using a 4F cobra catheter. The angiogram revealed dilated, tortuous arteries with an early draining vein along the mesenteric border of the splenic flexure of the colon, suggestive of an angiodysplastic lesion, which was super-selectively cannulated using a coaxial 2.7F microcatheter [Table/Fig-1-5] and subsequently embolised using multiple pushable micro-coils, with the coils placed at the arcuate artery level [Table/Fig-6,7]. The postembolisation angiogram showed a significant reduction in blood flow to the dysplastic lesion.



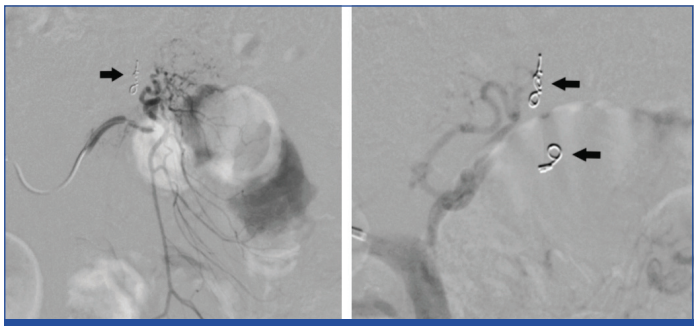
[Table/Fig-1-3]: Superior mesenteric artery angiogram showing abnormal tortuous vessels along the splenic flexure of colon. (Arrow showing abnormal tortuous vessels). (Images from left to right)

Postembolisation, the patient's vital signs stabilised within 6-8 hours, allowing for the withdrawal of ionotropic support. Preprocedure, his haemoglobin was 7.20 gm/dL, and his haematocrit was 21.20%. One packed cell transfusion was given during the procedure. By postprocedure day two, his blood parameters had improved, with a haemoglobin level of 9 gm/dL and a haematocrit of 25.90%, with no need for further transfusions.

A repeat colonoscopy was performed on the third postoperative day, which showed no active bleeding from the splenic flexure, although there were traces of residual luminal blood in the sigmoid colon. The patient returned for a follow-up after one month, reporting no melena; his haemoglobin was 12.4 gm/dL, and he was in good clinical condition.



[Table/Fig-4,5]: Superselective angiogram reveals dilated tortuous arteries with early draining vein along mesenteric border of splenic flexure of colon s/o Angio-dysplastic lesion. (Arrow showing abnormal tortuous arteries; star showing microcatheter tip; arrow head showing early draining veins). (Images from left to right)



[Table/Fig-6,7]: Feeding vessels were subsequently embolised using multiple pushable micro-coils with coils placed at arcuate artery level (arrow). (Images from left to right)

DISCUSSION

Gastrointestinal Angiodysplasias (GIADs) are pathologically dilated communications between mucosal capillaries and submucosal veins. This condition is also referred to as angioectasias, vascular ectasias, or arteriovenous malformations. These lesions account for most diagnosed vascular lesions of the GI tract [1].

Angiodysplasia is the most common vascular lesion of the GI tract, and this condition may be asymptomatic or may cause GI bleeding [2]. Angiodysplasia is a common vascular abnormality of the GI tract, second only to diverticulosis in causing lower GI bleeding in older patients over the age of 60 years [3].

The prevalence of GI angiodysplasias ranges from 2.6-6.2% among patients evaluated specifically for occult blood in the stool, anaemia, or haemorrhage [4]. Angiodysplasia is a vascular malformation of the bowel, most commonly involving the terminal ileum, right colon and caecum, with the colon being the most common site [5]. The exact mechanism of the development of angiodysplasia is not known, but chronic venous obstruction may play a role [6].

Angiodysplasia causes low GI bleeding. At first presentation, 90% of GIADs will stop bleeding spontaneously [7]; however, repetitive bleeding is common in angiodysplasia. Some cases may present with subtle blood loss, predominant anaemia symptoms, recurrent episodes of melena and iron deficiency anaemia [8]. There are many treatment modalities for angiodysplasia, ranging from endoscopy and surgery to vasopressin infusion and endovascular embolisation of the feeding artery. Endoscopy is invariably the first investigation for both diagnosis and treatment [9].

The failure of endoscopic diagnosis and management can reach up to 32% due to a large amount of blood in the lumen and difficulty in accessing the site with the scope [10]. Surgical treatment with resection and anastomosis may be a definitive treatment option but carries high risks of morbidity and mortality. Treatment with intra-arterial embolisation was first described by Bookstein JJ et al., in 1974 [11].

Transcatheter arterial embolisation is an important tool for treating active GI bleeding, particularly when endoscopic therapy has failed and the patient is not eligible for surgery [12]. On angiography, the sensitivity for the diagnosis of angiodysplasia ranges from 58-86% and depends on whether there is active bleeding at the time of the procedure [13].

Luminal extravasation of contrast can be demonstrated in only 6-20% of patients [14]. Angiographically, it is visualised as densely opacified, dilated, tortuous and slowly emptying intramural veins, as well as, a vascular tuft representing dilated mucosal venules and capillaries in the arterial phase. At the latest stage, arteriovenous communication is observed due to precapillary sphincter loss [15].

Embolisation of the arterial side can be performed with various agents. The most commonly used agents include Polyvinyl Alcohol (PVA) particles and coils. Other agents include gelfoam, autologous blood clot and N-butyl Cyanoacrylate (NBCA) [16]. The authors prefer coils because they provide good visualisation on fluoroscopy, avoid reflux of particles, and fulfill the objective of reducing perfusion pressure while allowing collateral flow to prevent bowel ischaemia. If coils are inadequate, larger-sized PVA particles can be used for distal embolisation, sparing the capillary level.

N-butyl cyanoacrylate glue is a distal permanent embolising agent that readily polymerises and forms a hard cast when exposed to any ionic solution (e.g., blood, normal saline). It is mixed with an oil-based contrast agent (such as lipiodol) for radio-opacity, which also slows down the rate of polymerisation depending on the ratio of the glue to the contrast mixture. To date, success rates for endovascular embolisation have reached 80-100%; failure (20%) can occur due to vessel spasm, perforation, dissection, vessel tortuosity, or cessation of bleeding [8]. In the present case, angiography and endovascular embolisation were performed because the patient was haemodynamically unstable, and colonoscopy precisely localised the site of the lesion.

Ali TA et al., presented a similar case of duodenal angiodysplasia with super-selective coil embolisation of the gastroduodenal artery [17]. Cessation of blood extravasation was achieved with clinical improvement in the patient, similar to the present case.

Similarly, angiodysplasia of the caecum in a haemodynamically unstable patient was embolised via an endovascular approach by Phu PHV et al., using a mixture of NBCA and lipiodol [18]. Postembolisation, the patient's vital signs improved.

Early rebleeding within 30 days after successful initial embolisation occurs in 10-30% of cases [19]. The success rate of embolisation of small peripheral intestinal arterial branches using microtubules ranges from 80-100% [20]. The exact cause of this early rebleeding is uncertain; it may result from recanalisation of the previously embolised site or new sources of bleeding in the GI tract [19,20].

The most feared complication of embolisation is bowel infarction. Intestinal infarction due to embolisation in the treatment of low digestive haemorrhage is observed in up to 22% [21]. However, the development of super-selective catheterisation has significantly reduced the rate of bowel infarction [22], as demonstrated by Zhao Y et al., when they performed transarterial embolisation with NBCA in seven patients with persistent GI haemorrhages whose conservative treatment had failed; only one (14%) patient experienced rebleeding, and none suffered from bowel infarction [8].

Embolisation is fast, minimally invasive, and has a relatively high success rate. It provides a targeted approach that allows for rapid control of bleeding. The procedure can be performed under local anaesthesia, which eliminates the need for the already compromised patient to undergo the risks associated with general or spinal anaesthesia required for surgical procedures.

CONCLUSION(S)

Super-selective embolisation is a safe and effective method for managing lower gastrointestinal bleeding due to angiodysplasia, especially in cases with failed or negative endoscopy, as well as, in haemodynamically unstable patients.

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