Unusual presentation of more common disease/injury

Successful resection of complicated bleeding arteriovenous malformation of the jejunum in patients starting dual-antiplatelet therapy just after implanting a drug-eluting coronary stent

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Summary

We report a case of a 57-year-old man who started dual-antiplatelet therapy with aspirin and clopidogrel following implantation of drug-eluting coronary stent and developed persistent active gastrointestinal bleeding. After detecting the origin of bleeding by double-balloon enteroscopy, successful laparoscopy-assisted partial jejunal resection was performed and the patient condition was promptly recovered, without any thrombotic or bleeding complications. Pathology revealed arteriovenous malformation of the jejunum without any malignancy. We should care for and be aware of this lesion as a rare cause of gastrointestinal bleeding when strong antithrombotic therapy is initiated. Under rigorous assessment and perioperative management, as well as meticulous intraoperative dissection and haemostasis, satisfactory outcome was achieved even in this complicated situation.

BACKGROUND

Arteriovenous malformation (AVM), also known as angiodysplasia or vascular ectasia, of the small bowel is uncommon disease entity.^{1 2} The common location of this disease is the caecum and ascending colon, where it may occur in 25% of people over 60 years of age.^{1 3 4} In the small intestine, it presents a taxing surgical problem, since it may cause unexplained gastrointestinal (GI) bleeding but it is often difficult to diagnose.² We report a case of patients undergoing successful resection of complicated bleeding AVM of the jejunum in patients with dual-antiplatelet therapy (DAPT) just after implanting drug-eluting coronary stent (DES).

CASE PRESENTATION

A 57-year-old Japanese man suffering angina pectoris and long-standing diabetes mellitus was admitted to our hospital for further management. Coronary angiography performed and resulted in an insertion of an everolimus-eluting stent into his left anterior descending coronary artery. Just after this procedure, he was started on DAPT with clopidogrel and aspirin. His admission was complicated by melena and progressing anaemia which started 3 days after initiating DAPT. Initially his symptom was not relieved by conservative management, and transfusion with a total of 10 units of red blood cell concentrate was needed (figure 2). CT angiography failed to detect the origin of GI bleeding at that time. After stabilising the patient's condition and minimising the progression of anaemia, the gastroenterology unit and general surgical team were consulted to evaluate the patient. After several evaluations of endoscopic investigation

including double-balloon enteroscopy, it was diagnosed as bleeding from the elevated mass-like lesion of the jejunum that is located at the jejunum about 150 cm distally from the ligament of Treitz (figure 1A,B).

TREATMENT

After discussing how to best manage the patient's DAPT in the perioperative period by surgeons, cardiologists and anaesthetists, a plan was carefully documented and forwarded to all departments involved in the patient's management, and finally decided that aspirin as well as clopidogrel were continued just before surgery to prevent possible subacute stent thrombosis. The patient was informed regarding risk, benefits and alternatives of diagnostic laparoscopy, possible bowel resection and laparotomy and agreed with the operation.

A surgical intervention was attempted as a submergent setting. Under thorough examination and meticulous adhesiolysis surrounding the lesion to minimise the bleeding was achieved laparoscopically, a mass lesion in the jejunum was found and the jejunum including the lesion was exteriorised through 5 cm supraumbilical incision. After the location of the lesion was confirmed by palpating a metal clip marked by endoscopy, the patient underwent successful partial resection of the jejunum. There was no intraoperative excessive bleeding, and a total operative time was 57 min. Resected jejunum showed discrete disruption of jejunal mucosa without any mass formation (figure 1C). Pathology revealed focal collections of submucosal markedly dilated arterioles and venules with rupture and haemorrhage, which was diagnosed as AVM of the jejunum (figure 1D).

Figure 1 (A and B) Double-balloon enteroscopy revealed an elevated mass-like lesion in the jejunum about 150 cm distally from the ligament of Treitz. (B) A closer observation of the lesion showing active bleeding from its surface. (C) Resected jejunum showing discrete disruption of jejunal mucosa without any mass formation. (D) Pathology revealed focal collections of submucosal markedly dilated arterioles and venules with rupture and haemorrhage, which was diagnosed as arteriovenous malformation of the jejunum (Elastica van Gieson stain, low-power magnification).

OUTCOME AND FOLLOW-UP

The patient recovered soon postoperatively without any thrombotic or bleeding complications (figure 2). He remained asymptomatic and free of any signs of recurrence for 24 months since his operation.

DISCUSSION

AVM, or angiodysplasia, is the most common vascular lesion of the gastrointestinal tract, and after diverticulosis, it is the second leading cause of lower GI bleeding in patients older than 60 years.^{5 6} Phillips first described a vascular abnormality that caused bleeding from the large bowel in 1839.⁶ An association between colonic angiodysplasia and aortic

stenosis was also described by Heyde in 1958.⁷ However, confusion about the exact nature of these lesions resulted in a multitude of terms that included AVM, haemangioma, telangiectasia and vascular ectasia, and these terms have varying pathophysiologies.⁶

AVM is a degenerative lesion of previously healthy blood vessels found most commonly in the caecum and proximal ascending colon.^{5 6} The vessel walls are thin, with little or no smooth muscle, and the vessels are ectatic and thin. The exact mechanism of development of AVM is not known, but chronic venous obstruction may play a role.^{8 9} This hypothesis accounts for the high prevalence of these lesions in the right colon and is based on the Laplace law.⁶

Figure 2 Perioperative clinical course of the patient. Persistent melena and anaemia was started just after dual-antiplatelet therapy with aspirin and clopidogrel was initiated following insertion of drug-eluting coronary stent. After detecting the origin of gastrointestinal bleeding by double-balloon enteroscopy, successful partial jejunal resection was performed and the patient condition was promptly recovered, without any thrombotic or bleeding complications. CS, colon fibrescope; DES, drug-eluting coronary stent; GIS, upper gastrointestinal fiberscope; RCC, red blood cell concentrate .

These lesions typically are nonpalpable and small (<5 mm), but in the small bowel it may account for 30–40% of cases of GI bleeding of obscure origin,⁶ and it may be critical when related to massive bleeding, like the current case. We should aware the diversity in GI tract bleeding, and an index of high suspicion and early diagnosis is mandatory to avoid critical complications. The importance of making a careful differential diagnosis and early appropriate management should be well emphasised.

Recently, DES is rapidly replacing bare metal stents in the management of patients requiring coronary artery stents.^{10–11} A DES releases a compound that prevents endothelial cells coating the bare metal of the stent, thus patients treated with DES implantation need long-term DAPT with aspirin and thienopyridines, which reduce stent rethrombosis rates to <2%.¹⁰ However, the consequences for patients undergoing surgery, or patients with potential bleeding conditions, in whom a DES has been inserted with DAPT, are serious and potentially life-threatening.^{10–11} like the case in the present study. So far, there are few reported cases of patients undergoing non-cardiac surgery with DES and antiplatelet therapy.^{12–14} The risks in these patients are related to excessive bleeding as a result of continued antiplatelet therapy on the one hand, and stent thrombosis as a result of withdrawal of DAPT on the other.^{12–15} Iakovou *et al*¹⁶ reported that cessation of the antiplatelet therapy increases 90-fold relative risk of coronary thrombosis. However, continuation of DAPT may make the risk of perioperative bleeding significantly high, but so far there is no proposed bridging therapy during cessation of antiplatelet therapy. Some institutes use heparin as a substitute to antiplatelets, but heparin is an antithrombin agent (anticoagulant) and not an antiplatelet, and heparin therapy has not been proven to be effective.¹² Despite the elevated risk of stent thrombosis, final decision should be made to perform platelet transfusion when life-threatening severe intraoperative bleeding occurs. In any case, rigorous assessment and perioperative management, as well as meticulous intraoperative dissection and haemostasis, is warranted in such a complicated situation.

With the advent of minimally invasive surgery and its expected benefits, many general surgical procedures are now being performed or attempted laparoscopically. Our case highlights diagnostic laparoscopy and laparoscopy-assisted bowel resection as a potential and feasible tool even in an emergent condition. The ability to confirm diagnosis and plan to target small incisions for treatment make laparoscopic surgery a viable treatment option, even in such a taxing case as in the current study.

Learning points

- ▶ Arteriovenous malformation (AVM) of the small bowel is an uncommon disease entity and may cause unexplained gastrointestinal bleeding which is often difficult to diagnose.

- ▶ We should be aware of the diversity in gastrointestinal tract bleeding, and an index of high suspicion and early diagnosis is mandatory to avoid critical complications.
- ▶ The importance of making a careful differential diagnosis and early appropriate management of small bowel AVM should be well emphasised.
- ▶ Patients with combined antiplatelet therapy following drug-eluting coronary stent (DES) who need to undergo abdominal surgery are extremely at high risk for stent thrombosis as well as bleeding complication.
- ▶ When abdominal surgery was planned in DES-implanted patients, rigorous assessment and perioperative management, as well as meticulous intraoperative dissection and haemostasis, are requisites to achieve successful outcome.

Competing interests None.

Patient consent Obtained.

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