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CASE REPORT

Diverticular bleeding complicating dual antiplatelet therapy after drug-eluting stent implantation

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Abstract

Acute lower gastrointestinal bleeding is defined as a bleeding situation in which blood loss has been occurring for less than 3 days resulting in haemodynamic instability, anaemia, or the need for blood transfusion. Diverticula and angiectasias are the most frequent sources of bleeding. Malignancy, inflammatory bowel disease, non-steroidal anti-inflammatory drugs, infectious colitis, ischaemia, anorectal disorders, postpolypectomy bleeding, and HIV-related problems are less frequent causes. We describe a case of a female patient aged 87 admitted to hospital because of severe intestinal bleeding. The patient was on dual antiplatelet therapy after drug-eluting stent implantation. After red blood cell and fresh frozen plasma infusion, haemostatic drug treatment as well as withdrawal of antiplatelet agents, the patient's condition improved and became stable. Colonoscopy was then performed and residual bleeding from diverticula was revealed. Since the patient was free from symptoms and signs of recurrent bleeding, dual antiplatelet therapy was restarted without further complications.

Key words

dual antiplatelet therapy, drug-eluting stent, gastrointestinal bleeding, diverticula

INTRODUCTION

Lower gastrointestinal bleeding is defined as acute blood loss from a source distal to the ligament of Treitz. Acute lower gastrointestinal bleeding is defined as a bleeding situation in which blood loss has been occurring for less than 3 days leading to haemodynamic instability, anaemia, or the need for blood transfusion. Diverticula and angiectasias are the most frequent sources of bleeding. Malignancy, inflammatory bowel disease, non-steroidal anti-inflammatory drugs, infectious colitis, ischaemia, anorectal disorders, postpolypectomy bleeding, and HIV-related problems are less frequent causes [1]. In our patient, the diverticular bleeding was due to dual antiplatelet therapy after drug-eluting stent implantation.

CASE REPORT

An 87-year-old female patient with a history of poorly controlled hypertension, two-vessel coronary artery disease, colorectal diverticula, and chronic treatment with non-steroid anti-inflammatory drugs (NSAIDs) due to joint pain, was admitted to hospital because of severe weakness, fainting, low blood pressure on home measurements, and fresh blood in the stool. On admission, the patient was unable to move, pale, confused, with peripheral pulse weak and slow, probably as the result of chronic treatment with beta-blocking agent metoprolol. Neither symptoms nor signs of significant cardiac deterioration were observed. Laboratory results revealed a low haemoglobin level of 7.2 g/dl. A probe was introduced into the stomach to check for gastric bleeding, which was negative. Since the patient had a history of diverticula they were suspected to be the most probable source of bleeding. The precipitating factor could be the dual antiplatelet therapy the patient received after drug-eluting stent implantation to proximal part of the left anterior descending artery about two weeks earlier. Because of the severity of symptoms and signs due to significant blood loss the patient was examined by the surgeon several times, but no overt indications for urgent surgery were found.

The patient was admitted to the Intensive Cardiac Unit for monitoring and further treatment. Dual antiplatelet therapy was stopped and 4 units of red blood cells, as well as 4 units of fresh frozen plasma were given. The patient also received proton pump inhibitor intravenously and cyclonamine. Because of the positive medical history for diverticula and significant increase in C-reactive protein level (93 mg/dl with upper normal value of 5 mg/dl), oral antibiotics approved for diverticulitis, including rifaximine 200 mg twice daily and metronidazol 1,000 mg three times daily were applied. The bleeding was managed successfully and a stable haemoglobin level was achieved. No signs of myocardial ischaemia were found. Colonoscopy was performed to check for the source of bleeding. Residual bleeding from diverticula was found during the imaging which confirmed our previous suspicion. Having achieved permanent improvement of the patient's condition, dual antiplatelet therapy was restarted. No recurrent bleeding was observed and the patient could be safely discharged from hospital.

DISCUSSION

The most important progress in modern medical techniques are for sure percutaneous coronary interventions (PCI). Coronary angioplasty with stent implantation has changed the prognosis and course of acute myocardial infarction, as well as severe stable angina. Coronary restenosis has long

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been considered the main limitation hampering the efficacy of percutaneous revascularization. Thus bare – metal stents (BMS) have been introduced to improve the results of PCI. BMS is a kind of a metal tube that can be made from stainless steel or nickel-titanium alloy [1]. It is introduced into the coronary artery with the use of a special catheter to keep the blood vessels open after blockage. Since some residual risk of restenosis has remained after BMS implantation, drug-eluting stents (DES) have been created [2]. They are coated with antiproliferative drugs, including paclitaxel, sirolimus, everolimus and zotarolimus, which allows drug elution into the coronary wall for weeks after stent implantation to prevent restenosis resulting from neointimal hyperplasia. The procedure for insertion of a drug-eluting stent is the same as for a bare-metal stent. Unfortunately, drug cover delays arterial healing, prolonging the risk of coronary stent thrombosis due to platelet adhaesion and aggregation up to one year after the procedure [3]. Dual antiplatelet therapy (DAPT) composed of aspirin and a thienopyridine, including clopidogrel, prasugrel and ticagrelor, is recommended to prevent in-stent thrombosis, both after BMS and DES implantation [4]. Since thrombotic complications after DES implantation may develop within one year after PCI, prolonged DAPT should be applied [5]. Bleeding is the most important complication of prolonged dual antiplatelet therapy [6, 7]. The main source of bleeding is the gastrointestinal tract (GIB), especially its lower part (LGIB), and its severity increases with greater potency and longer duration of DAPT [8]. This is due to the common use of proton pump inhibitors as a supportive treatment in patients on DAPT which decreases the risk of upper gastrointestinal bleeding (UGIB). Proton pump inhibitors have no therapeutic effect beyond the duodenum, and small doses of aspirin like those within DAPT may induce small and large bowel damage [9]. In this regard, small bowel angiodsyplasia, diverticular bleeding, rectal cancer, ischaemic colitis, colonic cancer, colonic polyps, ulcerative colitis and haemorrhoids are mentioned in the literature [8]. It is highly probable that most of these disorders are unmasked by DAPT. Although the optimal duration of dual antiplatelet therapy remains uncertain, a shorter duration is being investigated to decrease the risk of severe bleeding. Surprisingly, extended DAPT has not been observed to improve prognosis with regard to all-cause mortality and cardiovascular episodes [10, 11].

Diverticular bleeding is the most common cause of LGIB and accounts for 20% to 50% of cases. Acute diverticular bleeding affects 3% – 15% of individuals with diverticular disease [12]. Diverticular bleeding is thought to be the result of a rupture of an arteriosclerotic altered diverticular vessel [13]. In about a third of cases, massive bleeding requires blood transfusion.

NSAIDs, including aspirin, have already been identified as risk factors for acute LGIB, especially acute diverticular bleeding. NSAIDs reduce mucosal prostaglandin production, which leads to enhanced mucosal permeability and reduced microcirculation, and subsequently, to mucosal inflammation and bleeding [14, 15]. Diverticular bleeding occurs when a nutrient artery ruptures into the colon lumen, and commonly involves local mucosal ulceration in the absence of inflammation. In addition, it is likely that NSAIDs promote blood loss from existing lesions via inhibition of platelet aggregation. Regular use of aspirin or NSAIDs is associated with an increased risk for diverticulitis and diverticular bleeding. Patients at risk for diverticular complications should carefully consider the potential risks and benefits of using these medications [16]. Other approved independent risk factors for colonic diverticular bleeding include atherosclerosis and systemic arterial hypertension, especially poorly controlled [17, 18]. All these risk factors were present in our patient.

Diverticular bleeding stops spontaneously in 70% – 80% of cases. Recently, urgent colonoscopy has been advocated as the optimal intervention for the diagnosis and treatment of lower GI bleeding. Procedures to stop bleeding include injection of adrenaline, clipping, electrocoagulation and rubber band ligation. Surgery should be considered if more than 4 – 6 packs of red cell concentrates have to be administered, if the bleeding lasts longer than 72 hours or there is recurrence of bleeding within a week.

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