

A Survival Journey: “Management of Acute Mesenteric Ischemia after Left Main and Multivessel Coronary Artery Intervention

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ABSTRACT

The complications after the percutaneous coronary intervention (PCI) are not uncommon, and usually, the operator keeps a high index of suspicion for the occurrence of any related complication. However, encountering an unrelated or unusual surgical emergency such as acute mesenteric ischemia (AMI) after left main and multivessel coronary artery intervention offers many challenges in managing the patient. An added risk is further potentiated by stopping dual antiplatelet therapy (DAPT) in the perioperative period, thus increasing the chance of stent thrombosis. If DAPT is continued, then the additional bleeding risk is inevitable. Herein, we report a case of AMI in a patient who underwent PCI. Our case emphasizes the management of all the challenges encountered in this scenario.

KEYWORDS

Acute mesenteric ischemia; Percutaneous coronary intervention

INTRODUCTION

Percutaneous coronary intervention (PCI) with stent implantation in the left main coronary artery (LMCA) has enormous prognostic implications because of larger myocardium at risk [1]. The outcome in such cases does not only depend on the success of the procedure but also depends on the uneventful hospital course and continuing potent dual antiplatelet therapy (DAPT) [1]. Any surgical emergency in the first few months after stent implantation requiring cessation of DAPT carries an added risk of stent thrombosis and subsequent poor outcomes [2]. Acute mesenteric ischemia (AMI) is an uncommon clinical entity after PCI; however, it can occur secondary to embolic or thrombotic occlusion of the mesenteric artery

[3]. We present here the survival journey of a case of life-threatening bowel perforation secondary to AMI just a day after left main and multivessel coronary artery intervention.

CASE REPORT

A 65-year-old male, chronic smoker, on optimal medical therapy for the chronic coronary syndrome (CCS), presented with frequent episodes of rest angina relieved by sublingual nitroglycerine for the last seven days and ongoing chest pain for 2 hours. The electrocardiogram showed ST depression in leads V2-V6. His pulse rate was 80 beats/minute, and blood pressure was 102/68 mmHg. His Echocardiogram suggested normal LV systolic function with impaired relaxation. The patient was

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immediately shifted to the cath lab for coronary angiography (CAG) which revealed triple vessel disease with significant narrowing of ostio-proximal LMCA (~70% stenosis), proximal- and mid- Left anterior descending (LAD) coronary artery (90% stenosis) and proximal left circumflex (LCX) coronary artery (>90% stenosis). His SYNTAX score was 26. Coronary artery bypass surgery was advised, but the patient and his relatives refused for surgery and were willing for PCI. As chest pain had ongoing angina, the patient was taken for PCI after discussing it with the patient and relatives. PCI was successfully done with the placement of 3 drug-eluting stents (DES), one each in LMCA, LAD & LCX. TIMI grade 3 flow was achieved without any complication (Figure 1A and Figure 1B).

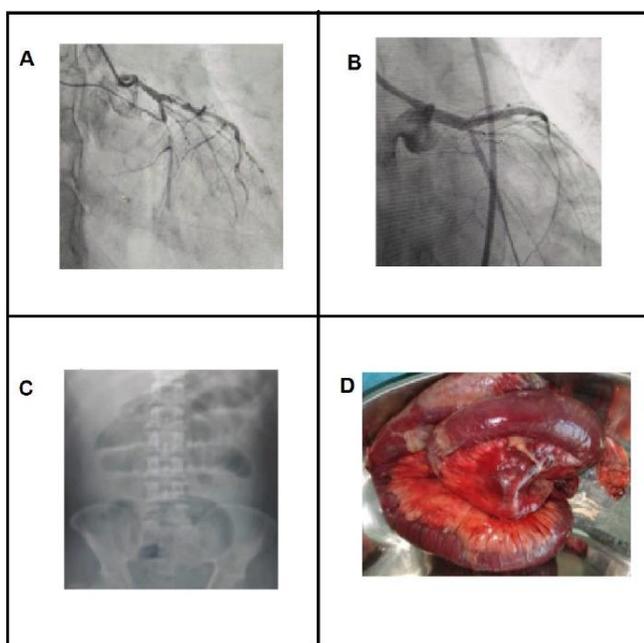


Figure 1: (A) Fluoroscopy images during percutaneous coronary intervention before stent implantation, (B) After stent implantation; (C) Multiple air-fluid levels in X-ray erect abdomen and (D) resected bowel segment with areas of necrosis.

On day-1 post-PCI, the patient developed diffuse abdominal pain and vomiting. Opinion from the General Surgery team was taken. The X-ray abdomen revealed a dilated bowel loop with multiple air-fluid levels (Figure 1C). Meanwhile, the patient became hemodynamically

unstable and was taken up for exploratory laparotomy immediately by the surgical team. On exploration, 15 cm of the terminal ileum, caecum, and 5 cm of ascending colon was found to be gangrenous with perforation. Resection of the gangrenous segment with end ileostomy and mucus fistula was done (Figure 1D). Gross examination of gangrenous bowel suggested mesenteric ischemia, which was confirmed on histopathological examination. The patient was shifted to the cardiac care unit (CCU) after surgery. He was given ventilatory support, intravenous antibiotics, inotropic support, optimal fluid therapy, and other supportive measures.

Considering the risk of fatal outcomes associated with LMCA stent thrombosis in the perioperative period, if DAPT is stopped, a decision of continuing aspirin was taken, while only one dose of Ticagrelor just after surgery was kept withhold followed by the continuation of DAPT. We continued DAPT (Aspirin 75 mg & Ticagrelor 90 mg BD) with close observation for any bleeding, especially from the operative site by monitoring output from the intra-abdominal drain and repeated ultrasonographic (USG) examination of abdomen for any internal collection of blood. Hemoglobin & hematocrit was monitored closely for the next 48 hours after surgery and daily thereafter for the next 7 days. Over the course of the hospital stay, the inotropic requirement decreased, the general condition improved. He was extubated on day 3 of exploratory laparotomy. The patient improved symptomatically with uneventful further in-hospital stay and was discharged on 10th day post-surgery. The patient was regularly called for follow up in the cardiology and general surgery OPD. The ileostomy was closed 5 months after surgery. He is on regular follow-up and is doing well without any cardiac or abdominal complaint.

DISCUSSION

We managed a case of a 65-year-old male admitted for ongoing anginal pain and underwent left main and

multivessel coronary artery intervention following which he had mesenteric ischemia with perforation peritonitis, which was subsequently managed with exploratory laparotomy. AMI after PCI is rare but can occur [3]. AMI has a low incidence, which varies from 0.63 to 12.9 per 100,000 person-years [4]. Its hospital burden is also low, with 1-10 per 10,000 hospital admissions [4]. AMI occurs due to interruption of blood supply to the small intestine leading to a cascade of events culminating into cellular damage and intestinal necrosis [5]. The cause of AMI is embolic occlusion of the mesenteric artery in around 50% cases, while thrombosis of the mesenteric artery occurs in about 25% cases [5]. Both these causes are common in patients with preexisting cardiovascular and atherosclerotic diseases, respectively. The third cause is non-occlusive mesenteric ischemia in nearly 20% cases with the possible mechanism of vasospasm rather than occlusion and is usually associated with hemodynamically unstable and critically ill patients [6]. Mesenteric venous thrombosis is the fourth pathophysiological mechanism leading to AMI by causing interstitial swelling with subsequent arterial flow limitation and is predominantly associated with deep vein thrombosis, pulmonary thromboembolism, portal hypertension, or hypercoagulable state [5,6]. Acute mesenteric thrombosis, when associated with the chronic atherosclerotic disease with compromised vessel lumen, has a higher tendency of complete occlusion by a thrombus or dislodged atherosclerotic plaque [7]. Aortic catheterization can also precipitate this condition by embolization of plaques [8]. In the present case also, the possibility of thromboembolic complete occlusion of the mesenteric artery precipitated by PCI was suspected. The clinical presentation in this patient about the surgical emergency was mainly diffuse abdominal pain followed by severe periumbilical pain, unlike the classical triad of severe abdominal pain, vomiting, and diarrhea, which is seen in almost 40%-80% patients with embolism related AMI [5,9]. Although AMI

can occur following any intervention requiring vascular manipulation, it is rare after CAG. Thus, after finding this rare clinical entity, a possibility of a preexisting thrombotic variety of AMI (TAMI) occurring as an association rather than the result of an embolic complication of PCI was raised. Although the age of the patient and associated long history of atherosclerotic coronary artery disease favors TAMI, but in the absence of any clinical clue, especially the lack of symptoms of TAMI such as postprandial abdominal pain, nausea, and weight loss, this possibility was partly excluded [5,9].

Despite the occurrence of a life-threatening surgical emergency, prompt diagnosis, and timely surgical intervention saved this patient's life. Any delay in the management of AMI dramatically elevates the mortality rate [9]. As the patient had already developed perforation peritonitis by the time diagnosis was made, other modalities such as endovascular embolectomy or percutaneous approach were not the right options, thus requiring exploratory laparotomy and surgical resection of the necrosed bowel segment. Another appalling situation that emerged in this patient was balancing the risk of bleeding and the risk of thrombosis of the stent, especially one which was placed in the LMCA. Recent recommendations on DAPT supports continuing DAPT until bleeding risk outweighs the benefit [10]. In the present case, the patient has already received morning dose of Aspirin & Ticagrelor by the time diagnosis of bowel perforation was made, and as immediate surgery was unavoidable, therefore it was done certainly at a higher risk of bleeding. Even for major non-cardiac surgery, continuing aspirin during the perioperative period and reinitiating potent DAPT in the postoperative period has been suggested after considering the risk of bleeding [10].

Key aspects in this patient management were prompt investigation and diagnosis, multidisciplinary approach,

and, most importantly, managing both the risk of stent thrombosis and bleeding where eventual fatal complications were imminent. Outweighing the risk of stent thrombosis against bleeding was reasonable in this patient because the stent was placed in LMCA thus jeopardizing a large amount of myocardium if occluded. However, if any bleeding complication would have occurred, then its management with blood transfusion was the viable option. At the same time, management of stent thrombosis would have been more challenging due to underlying conditions. Moreover, the risk of bleeding due to surgery was not overlooked and the patient was closely monitored clinically as well as by USG abdomen, haemoglobin & Haematocrit level, for any bleeding diathesis.

LEARNING OBJECTIVE

Any symptom should not be overlooked especially after a procedure such as percutaneous coronary intervention. If a timely diagnosis of a life-threatening condition such as bowel perforation secondary to acute mesenteric ischemia is made then appropriate management foreseeing the risk of stent thrombosis can help in patient's survival despite a dreaded event.

CONFLICT OF INTEREST

The Author(s) declare(s) that there is no conflict of interest.

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