Hybrid myocardial revascularization complicated by delayed anastomotic bleeding

Takayoshi Kato, MD · Yukio Umeda, MD
Ken-ichiro Azuma, MD · Shinji Murakawa, MD

Abstract We present a case of hybrid coronary revascularization complicated by delayed bleeding from an anastomotic site. Anastomosis of the left internal mammary artery to the left anterior descending coronary artery was successfully performed via a lateral anterior small thoracotomy. Scheduled subsequent percutaneous coronary intervention of residual stenoses was successfully performed 13 days after the surgery, but cardiac tamponade due to anastomotic site dehiscence was disclosed soon after the percutaneous procedure. We discuss the causation of the delayed bleeding that occurred after the hybrid coronary revascularization.

Key words Ischemic heart disease · Percutaneous coronary intervention · Coronary bypass surgery · Minimally invasive surgery

Introduction

Hybrid revascularization, combining minimally invasive direct coronary artery bypass (MIDCAB) to the left anterior descending artery (LAD) with percutaneous coronary intervention (PCI) of the other affected vessels, has become widespread because of its feasibility for selected patients, although several adverse outcomes have been documented.1–3 Our patient had delayed anastomotic bleeding after subsequent PCI performed 13 days after MIDCAB.

Case

A 72-year-old man was admitted with exacerbation of effort angina. Coronary angiography revealed total occlusion of the LAD and the circumflex artery, and 75% stenoses in the right coronary artery (RCA) (Fig. 1). Hybrid revascularization was conducted.

At operation, a left anterior small thoracotomy was made over the fourth intercostal space. The left internal mammary artery (LIMA) was harvested up to the second intercostal space. Anastomosis of the LIMA to the LAD with continuous 7-0 Prolene sutures (Ethicon, Somerville, NJ, USA) was successfully performed on the beating heart. The graft had an adequate length to the LAD.

The patient’s postoperative course was uneventful, and 100 mg of aspirin had been orally administrated since postoperative day (POD) 2. Thirteen days after surgery he electively underwent PCI of the remaining stenoses in the RCA. Deployment of intracoronary stent (S670; Medtronic, Minneapolis, MN, USA) was successfully achieved after confirmation of graft patency (Fig. 2A) and left ventriculography (LVG). Although the anastomotic site was satisfactory, adhesion of the major part of the pedicled LIMA to the chest wall seemed to restrict the graft’s movability. The patient was started on 100 mg of aspirin and 200 mg of ticropidine hydrochloride daily.

Five hours after the PCI, the patient complained of chest oppression. Although there were no new changes on his electrocardiogram and echocardiogram, cardiac tamponade deteriorated his circulation 2 days after PCI. Emergency angiography disclosed pulsating dye leakage from the anastomotic site (Fig. 2B). Reexploration was carried out via the same thoracotomy site, and severe...
adhesion of the harvested LIMA to the chest wall was documented. Dehiscence at the heel of the anastomotic site was repaired with an interrupted 7-0 Prolene suture. His second postoperative course was uncomplicated, and he was discharged in good condition.

Discussion

Although hybrid revascularization has become a valuable technique, some authors have reported several adverse events, such as acute stent thrombosis; and coronary dissection during subsequent PCI resulted in emergency surgery.\(^1\)\(^2\) The current case was complicated by delayed (POD 13) bleeding from the LIMA-LAD anastomotic site. Regarding general coronary surgery, some authors have stated that 5.9% of the patients who underwent coronary surgery required reexploration for bleeding, with graft side branches and anastomotic sites accounting for half of the sources of bleeding. In their series, no patients manifested the delayed bleeding that occurred in the current case.\(^4\)

In the case described here, no anastomotic dehiscence was apparent just before performing LVG and PCI. During these procedures, repetitive intervals of ventricular arrhythmia was seen. The catheter operation was carefully carried out, and there was neither forceful dye injection nor wire crossing in the anastomotic site. Angiography indicated restricted graft movability, implying the possibility of physical tension at the anastomotic site. Taking these factors into account, we speculate that slight displacement of the heart associated with ventricular arrhythmia during LVG and PCI may have resulted in excess pulling on the anastomosis in the context of immovability of the LIMA originating from postoperative adhesion.

We presented a rare case of hybrid coronary revascularization complicated by delayed bleeding from the