A Case Report of Recurrent Subacute Stent Thrombosis After Repetitive Percutaneous Coronary Interventions

Myung Soo Kang, MD, Ki Ju Jeung, MD, Ji Hyeong Kim, MD, Hye-Sun Seo, MD, Duk Won Bang, MD, Yoon Haeng Cho, MD, Na Hee Lee, MD, Min Su Hyon, MD, Sung Koo Kim, MD and Young Joo Kwan, MD
Division of Cardiology, Department of Internal Medicine, Soonchunhyang University College of Medicine, Bucheon, Korea

ABSTRACT

Stent thrombosis (ST) is one of the major complications that occur in percutaneous coronary interventions (PCIs) with stents. Various factors have been attributed to the development of ST, and several strategies have been recommended for its management. We report the case of a patient suffering from recurrent subacute STs after recurrent PCIs. The patient was treated by coronary artery bypass graft (CABG).

KEY WORDS: Stents; Thrombosis.

Introduction

Percutaneous coronary intervention (PCI) with stents is the most popular method for treating coronary artery disease (CAD). However, stent thrombosis (ST), one of the major complications in PCIs with stents, is highly lethal, and several methods for treating STs have been suggested. We report the case of a patient suffering from recurrent subacute STs after recurrent PCIs.

Case

A 50-year-old woman presented with syncope and chest tightness that had occurred 4 hours ago. She had no history of hypertension, diabetes mellitus, and chronic renal failure. Further, she did not taking any drugs that could deteriorate the platelet function. Her blood pressure was 140/80 mmHg, and her pulse rate was 80 beats per minute. Electrocardiography (ECG) revealed a third degree atrioventricular block (Fig. 1). Her plasma creatinine kinase, CK-myocardial band isoenzyme, and Troponin T levels were 143 IU/L, 6.5 ng/mL, and 0.31 ng/mL, respectively. On admission, she received 300 mg aspirin and 600 mg clopidogrel; subsequently, she continued to receive aspirin and 100 mg/day clopidogrel. Two days after admission, coronary angiography (CAG) revealed the culprit lesion of the subtotally occluded proximal portion of the left anterior descending artery (LAD) with thrombolysis in myocardial infarction (TIMI) grade 3 flow [quantitative coronary analysis (QCA), diameter stenosis (DS); 71.5% and 70% stenosis (QCA, 78.7%) in the middle segment of the right coronary artery (RCA) (Fig. 2). Two Cypher® stents (2.5/23 mm and 3.0/28 mm; Cordis/Johnson & Johnson, USA) were implanted in each lesion (Fig. 3) at 16 and 18 mmHg (post-PCI QCA: RCA, 8.3%; LAD, 6.5%), respectively, and cilostazole was applied. Two days after the PCI, the patient complained of chest pain. ECG revealed ST segment elevation in leads V2-V4 (Fig. 4). The second angiography revealed total occlusion in the previous stent-implanted area of the LAD (Fig. 5A), and PCI using a Cypher® stent (2.5/33 mm; Cordis/Johnson & Johnson, USA) was performed successfully (Fig. 5B). Two days after the second ST event, PCI using a Cypher® stent (2.5/33 mm; Cordis/Johnson & Johnson) at 18 mmHg was performed successfully (Fig. 6B).
episode, the patient complained of neck pain. ECG revealed ST segment elevation in leads V2-V6 (Fig. 7). However, emergency rescue PCI could not be performed at that time. Therefore, thrombolytic therapy with tissue plasminogen activator (t-PA) was performed successfully, and the fourth CAG showed no residual stenosis or thrombosis. However, right-side weakness, dysarthria, and disorientation occurred on the next day. Her brain CT scan revealed intracranial hemorrhage (ICH) in the thalamus near the left third ventricle. Despite this finding, we decided to continue administration of aspirin and clopidogrel to prevent additional ST episodes. After 4 days, her mental status improved but chest pain recurred. ECG revealed ST elevation in leads II, III, and aVF (Fig. 8). The fifth CAG showed total occlusion in the earlier stent-implanted lesion of the RCA (Fig. 9A). Emergency PCI using a Kongou® balloon (3.5/15 mm; Terumo Corp., Japan) at 16 mmHg was performed suc-
Fig. 3. CAG showed no residual stenosis in each lesion after 2 Cypher stents (Cordis/Johnson & Johnson, USA) were implanted in the lesions. A: post PCI angiography revealed well-deployed SES in mid portion of the LAD. B: post PCI angiography revealed well-deployed SES in mid portion of the RCA. CAG: coronary angiography, PCI: percutaneous coronary intervention.

Fig. 4. ECG showed ST segment elevation in leads V2-V4. ECG: electrocardiography.

Fig. 5. Second findings of coronary angiogram. The second CAG showed total occlusion (dark arrow) in the previous stent-implanted area of the LAD (A) and restored lesion (dotted arrow) after successful PCI with ReoPro (abciximab) infusion (B). CAG: coronary angiography, LAD: left anterior descending artery, PCI: percutaneous coronary intervention.
Fig. 6. The third finding of coronary angiogram. A, B: the third CAG showed total occlusion (dark arrow) of the pLAD and recanalized lesion (dotted arrow) after successful PCI. CAG: coronary angiography, pLAD: proximal left anterior descending artery, PCI: percutaneous coronary intervention.

Fig. 7. ECG showed ST segment elevation in leads V2-V6. ECG: electrocardiography.

Fig. 8. ECG showed ST segment elevation in leads II, III and aVF. ECG: electrocardiography.
Recurrent Stent Thrombosis Treated With CABG

Chest pain recurred 10 h after the PCI. Since CA G revealed a lesion in the R CA again (Fig. 10), we decided to perform coronary artery bypass graft (CABG). A few days after the emergency CABG, the patient recovered and was discharged without any complications. Thus far, the patient has shown good progress at follow-ups.

Discussion

Although the efficacy and safety of drug-eluting coronary stents (DESs) are well known, there are many concerns regarding ST after DES deployment. ST may occur acutely, subacutely (<30 days), lately (<1 year), or very lately (>1 year) and may result in serious complications associated with myocardial infarction (MI) and death.

In recent studies on ST, the rate of ST after DESs implantation was 1.2-1.8%; furthermore, it remains controversial whether DESs are more thrombogenic than bare metal stents (BMSs). According to a domestic research, the rate of ST after successful DES implantation was 1.8%, and except for 1 patient, ST occurred within 7 days in all patients. In our patient, ST occurred 5 times in multiple lesions (proximal LAD and middle RCA). To the best of our knowledge, this is the first study to report the occurrence of ST for more than 5 times in a patient without aspirin and clopidogrel resistance and blood abnormalities. Whenever STs occurred, emergency PCIs were performed. Finally, CABG was performed for ST management. It is known that most cases of ST are related to premature discontinuation of the antiplatelet therapy. Although dual antiplatelet therapy effectively attenuates ST, long and multiple stents, stent underexpansion, stent malapposition, residual dissection, impaired response to aspirin and clopidogrel, and platelet polymorphism may also affect ST. Our patient was daily administered with the dual antiplatelet therapy, and her platelet function analysis revealed a normal response to aspirin and clopidogrel, as mentioned earlier. Since we did not perform intravascular ultrasound (IVUS) of the coronary arteries, we were unable to determine the factors associated with ST, including stent malapposition. In conclusion, recurrent STs appear to occur by multiple causes. Emergency CABG is an effective method for managing recurrent STs.
Limitation

Since IVUS was not performed, the lesions could not be precisely observed, and the cause of multiple episodes of ST could not be determined.

REFERENCES