Catheter-induced coronary artery spasm is an uncommon complication of percutaneous coronary intervention and cardiac catheterization, but when it occurs, the outcome can be catastrophic. The choice of treatment, therefore, when confronted with this problem, is currently made of a case-by-case basis, with no evidence based guidelines to assist the operator. We present a case of catheter-induced left main coronary spasm and review the risk factors for this complication, prevention to avoid its occurrence and management options when it does occur.

Case Presentation

A 63 year-old female with hypertension, dyslipidemia and a history of ST elevation myocardial infarction (STEMI) with cardiogenic shock after stenting at proximal and mid part of left anterior descending artery (LAD). Two months later she was admitted with unstable angina and near syncope. Cardiac catheterization showed an 80% diffuse instent restenosis at previous mid LAD stent (Figure 1) another vessels show no significant stenosis. Percutaneous coronary intervention (PCI) was performed. The left main (LM) artery was engaged with 6F Launcher EBU 3.5 guiding catheter.

The distal part of the LAD was wired with 0.014” Rinato wire and ballooned with Flextome cutting Monorail (Boston Scientific Corp., Natick, Massachusetts) 2.5 x 10 mm at in stent restenosis lesion (Figure 2). While pulling the cutting balloon out, the patient suddenly complained of severe chest pain. There was ST-segment elevation in
performed (Figure 4B). The procedure result was excellent with TIMI (Thrombolysis in Myocardial Infarction) flow (TIMI-3) distally (Figure 5) without no residual stenosis. The patient’s chest pain and ECG changes was resolved. The hemodynamic condition was improved and patient was transferred to CCU. The patient was discharged the following day.

**Discussion**

The incidence of LM spasm is 0.26-3% varies with type of the catheter used, the skill of the operator, and medication received prior to the procedure (1-3). Severe spasm can occur spontaneously or secondary to catheter manipulation. Vasoactive substances such as Neuropeptide-Y, acetylcholine, ergonovine, histamine, serotonin were potentially trigger spasm. Both sympathetic and parasympathetic activation were also reported to aggravate the process (4).

Catheter-induced spasm such as in this case is usually related to mechanical irritation. Risk factors include increased catheter: LM diameter ratio, catheter-to-LM wall contact, vessel bulging and acute catheter-to-LM angle (5). Alvarez et al reported severe, diffuse accordion-like spasm of an angulated LM during percutaneous intervention of the left anterior descending artery using a stiff guide wire (6) several local vasoconstrictor and platelet aggregation at the catheter tip with release of vasoactive agents was also been reported administration of nitroglycerine and/or...
repositioning of the catheter usually leads to prompt resolution of spasm (7). Very rarely, such as in this case that the spasm may be prolong. Because of severe thermodynamically instable in this case so vasodilator such as nitroglycerine intra coronary artery cannot be given to correct the spasm.

In this case LM dissection is another cause that cannot be ruled out. Even the angiogram cannot be completed because of emergency situation; the angiogram was done only 1 frame before intra aortic balloon pump was rapidly inserted. If the blood pressure improved after IABP insertion, nitroglycerine can be given but in this case, LM stenting was a preferred strategy in this situation.

Learning point from this case is severe LM spasm and dissection can be a fatal situation. Rapid detection and prompt management are required. LM injury from sucking catheter may happen because too rapid deflation and pull cutting balloon out. Too short LM and mal-alignment of catheter also be reported. Number of factors that were associated with increased risk for LM coronary artery dissection such as LM disease (8), vigorous contrast injection (9) and vigorous deep inspiration (10).

Don’t be hesitated to call for help from another person to help you. Good teams especially scrub nurse, prompt equipments and cardiothoracic surgeon support is mandatory. To prevent this situation you should check guiding catheter position while pulling out the equipment, not deflate and pull out cutting balloon too rapidly, gently pull back any equipment. Sometime you should anchor another wire in aortic cusp to prevent sucking catheter while pulling equipment (11). The whole emergency procedure should be finished in a matter of minutes in order to reverse the process of hemodynamic collapse, shock, or impending death. Interventional cardiologists should always keep this phenomenon in mind during every procedure, in order to avoiding and preventing this fatal complication.

Conflict of Interest
None

References