



### H81 Stent Thrombosis After Percutaneous Coronary Intervention (PCI) in Spontaneous Coronary Artery Dissection (SCAD)

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**Learning Overview:** After attending this presentation, attendees will better appreciate the issues related to no-reflow in revascularization treatment by percutaneous intervention in spontaneous coronary dissection.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by reporting the major complications related to PCIs and their management in forensic pathology.

SCAD is a rare non-atherosclerotic cause of Acute Coronary Syndrome (ACS), accounting for 0.1% to 0.4% of all cases. SCAD occurs mostly in young women  $\leq 50$  years of age, and its causes are poorly understood and thought to be multifactorial with genetic, hormonal, and environmental influences. SCAD usually affect distal parts of coronary arteries and is caused by sudden disruption of the coronary arterial wall, resulting in separation of the intimal lining from the outer vessel wall and intramural hematoma formation. Pressure-driven expansion of the hematoma causes propagation of the dissection plane with formation of a false lumen containing thrombus. SCAD with active ischemia requires revascularization, preferably via stent implantation by PCI. PCI in SCAD has a success rate of  $< 50\%$ ; the major causes of morbidity and mortality after PCI are typically ischemic complications due to coronary dissection/hematoma propagation and stent thrombosis with abrupt vessel closure.

The presented report highlights the case of a 35-year-old woman admitted to the hospital emergency department with constrictive retrosternal pain radiating to the jugular area. Electrocardiogram (ECG) revealed pathologic waves in V1-V4, and laboratory tests showed an increase in myocardial enzyme levels (myoglobin 192.90U/L, total CK 1,053U/L, CK-MB 118U/L, LDH 639U/L). Coronary angiography revealed a spiral-shaped dissection in the Left Anterior Descending (LAD) coronary artery extending from the middle to the apex with a Thrombolysis-In-Myocardial-Infarction (TIMI) grade 2 flow. The following day, an ST-elevation (1mm) in V2-V5 was observed in the ECG (i.e., ST-Elevation Myocardial Infarction [STEMI]) and coronary angioplasty was performed with a subsequent decrease in myocardial enzyme levels and a remission of symptoms. After ten days, the patient again developed chest pain with an ST-elevation in the ECG (i.e., STEMI). Emergent PCI with implantation of a zotarolimus-eluting stent (3.5 x 16mm) was performed, but within 12 hours the condition of the patient rapidly declined and she expired.

An autopsy was performed to determine the cause of death. Gross examination of the heart revealed coronary vessels characterized by tortuous course and a bluish color. A palpable endovascular device was evident in the medial portion of the LAD coronary artery. Coronary arterial sectioning revealed an intimal dissection with a false lumen occupied by thrombotic material extending from 1cm after the origin of the LAD to the cardiac apex. Approximately 2cm after the origin of the LAD, a stent was found; the stent lumen, however, was completely occluded by thrombus. The thrombus originated from the stent and extended to the distal lumen of the LAD. Myocardial sectioning revealed an extended hemorrhagic infarction within the anterior wall of the Left Ventricle (LV) and the anterior interventricular septum.

In the presented case, stent thrombosis complicated PCI intervention; the presence of thrombotic endoluminal material in correspondence to the stent developed suddenly with resulting occlusion of the LAD coronary artery, resulting in an extensive myocardial infarction. The rapid evolution a relatively infrequent disease and possibility of different complications make any therapeutic intervention challenging—especially considering that current SCAD therapy is based upon opinion rather than randomized clinical trials. On the other hand, PCI results have also proven suboptimal in this challenging group of patients.

#### Coronary Artery Dissection, Percutaneous Coronary Intervention, Autopsy Investigation