

# Spontaneous Coronary Artery Dissection – A Case Report

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## Abstract

*Spontaneous coronary artery dissection is a rather rare cause of myocardial infarction, chest pain, and sudden death. There are currently no known direct causes of this condition. Most of the reported dissections have occurred in the left anterior descending coronary artery. Herein, we report the case of a 58-year-old woman who presented at our institution with an acute ST-elevation myocardial infarction secondary to a spontaneous dissection of the right coronary artery. Primary PCI resolved the occlusion of the artery, and the patient was discharged from the hospital on medical therapy.*

**Key Words:** Coronary artery dissection, myocardial infarction

## Introduction

Spontaneous coronary artery dissection (SCAD) is a rare entity; the overall incidence on coronary angiographies is around 0.2%. The mean age of presentation is 42 years, with three-quarters of cases reported in women, of which 30% are peripartum.<sup>1</sup> The left anterior descending coronary artery is the most involved vessel in women (75%) and the right coronary artery in men (20%).<sup>2</sup> Risk factors for SCAD comprise pregnancy, hypertension, recent delivery of a baby, fibromuscular dysplasia and connective-tissue disorders (e.g., Marfan syndrome and Ehlers-Danlos syndrome).<sup>3</sup> The clinical presentation of SCAD depends on the extent and the flow limiting severity of the coronary artery dissection, and ranges from asymptomatic to unstable angina, acute myocardial infarction, ventricular arrhythmias to sudden cardiac death. Coronary angiography is frequently used in the evaluation of patients with acute coronary syndromes.

We illustrate below the rare case of a 58-year-old postmenopausal woman with a history of Hodgkin's lymphoma treated with chemotherapy, presented with acute coronary syndrome caused by an extensive dissection of the right coronary artery.

## Case report

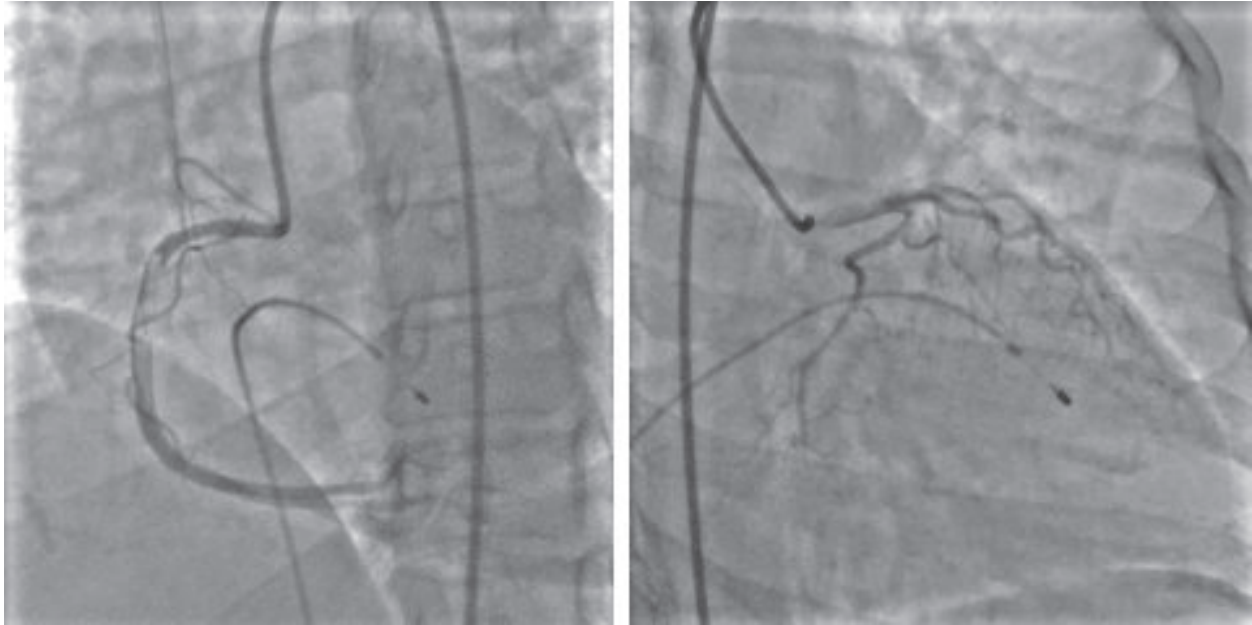
A 58-year-old hypertensive and diabetic lady was attended in the emergency department in the morning suffering from chest pain that had started 20 minutes previously associated with diaphoresis, vomiting. She was known case of Hodgkin's lymphoma and treated with combination of chemotherapy and radiotherapy for last 3 months. The patient was anemic, her pulse rate was 50 beats per minute, and blood pressure at admission was nonrecordable. Physical examination of chest revealed no abnormality.

ECG: ST elevation in lead II, III, AVF,  $h_s$  TnI –3375.3 pg/mL. CBC revealed Hb%–7.4g/dl, WBC– $2.8 \times 10^3/\mu\text{l}$ , PC– $165 \times 10^3/\mu\text{l}$ . Anti CCP–5.3 U/l.



**Fig.-1:** ECG showed ST elevation in lead II, III, AVF.

Echo: Basal, mid segment of inferior wall is hypokinetic, LVEF-50-54%.



**Fig.-2 :** *Dissection involving RCA.*

The patient was initially placed on dual antiplatelet therapy with aspirin and clopidogrel, statin and IV fluid. Immediately the patient was referred for coronarography with the aim of primary angiography. Hence, dissection of the proximal and medial thirds of the right coronary artery was identified (Figure2) and primary PCI to RCA was done uneventfully. Her other co morbidities were treated accordingly.

### Discussion

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome first described in 1931.<sup>4</sup> Coronary artery dissections are characterized by a separation of the layers of the artery wall. This results in a false lumen or an intramural haematoma in the area of the media.<sup>5</sup>

The etiology of coronary dissection remains uncertain and the majority of authors classify patients into three groups: women, patients with atherosclerosis and those without an identifiable cause.<sup>6</sup> There is an empirical association between coronary dissection and pregnancy. This is due to hormonal variations which influence the composition of the vessel. Together with hemodynamic alterations, coronary arteries become more susceptible.<sup>7</sup> The incidence in postmenopausal women is rare;

The patients with dissection related to atherosclerosis seem to have a more benign course, as they have a chance to develop a network of collateral circulation.<sup>7</sup>

In the case reported here, the patient was postmenopausal and suffering from Hodgkin's lymphoma and treated with

combination of chemotherapy and radiotherapy. She presented with acute MI within three months of treatment. The patient here did not report any comorbidity worthy of concern in her clinical history except hypertension. Heart diseases are among the frequently seen long-term effects of chemo/radiotherapy used in HL treatment. Mediastinal radiotherapy and cardiotoxic chemotherapeutic agents are commonly associated with a variety of cardiovascular complications including CAD. The mechanism of injury is multifactorial and likely involves endothelial damage of the coronary arteries and secretion of multiple inflammatory and profibrotic cytokines. Heidenreich et al have reported unexpected early deaths from myocardial infarction at young ages after HL.<sup>8,9,10</sup> Radiation-induced SCAD is a well-known entity especially after radiotherapy to the chest area in patients with Hodgkin's disease or breast cancer; long-term follow up is recommended. It can occur as early as three years after radiotherapy.<sup>11</sup>

In this case, the patient had a clinical presentation related to acute myocardial infarction. The clinical manifestation depends on the affected artery, the position and extension of the dissection. However, coronary dissections generally present as sudden death and diagnosis of the majority of cases is during an autopsy.<sup>6</sup> For the patient coronary angiography was done immediately because coronary angiography is the primary tool for diagnosis of SCAD. We did not utilize IVUS in the patient presented in this report because angiographic

assessment revealed high diagnostic accuracy and the patient condition was unstable where primary PCI was first concern. Intracoronary imaging techniques such as intravascular ultrasound (IVUS) and optical coherence tomography (OCT), which provide detailed morphological information on coronary lesions and on the location of dissection planes between the different layers of the arterial wall, have enabled a more detailed clinical assessment of SCAD.<sup>5</sup> Furthermore, non-invasive coronary angiography by multidetector computed tomography (MDCT) has been used for longitudinal follow-up evaluation of patients with SCAD.

The decision about the best management depends on several factors: clinical presentation, the location and extension of the dissection and the affected area of the heart. Therapy using medicines, such as aspirin and glycoprotein IIb/IIa antagonists, beta blockers and nitrates, is indicated for asymptomatic and stable patients or those with limited dissections.<sup>2,7,12</sup>

Primary PCI was performed in that case uneventfully because she presented with acute MI with cardiogenic shock. When a large area of myocardium is at risk, it is necessary to reperfuse it, and so percutaneous transluminal coronary angioplasty utilizing a stent is the first option with the aim of occluding the false lumen and redirecting flow to the true lumen. The results are excellent with low complication rates. Intravenous thrombolysis has been demonstrated as beneficial, causing lysis of blood clots in the false lumen and thus reducing compression of the true lumen. However, the majority of studies associate the use of thrombolytic agents to a worsening of the condition, increasing the lesion by expansion of the intramural hematoma.<sup>8</sup>

### Conclusion

Spontaneous coronary dissection is a rare cause of acute myocardial ischemia. Generally, it occurs in young women during childbirth but it may also affect postmenopausal women. Diagnosis of the dissection in this case was by coronary angiography and coronary angioplasty was done for treating ischemia. The decision of clinical treatment, percutaneous transluminal

intervention or revascularization surgery is based on the primary clinical presentation, extension of the dissection and the area of the heart in danger of myocardial ischemia.

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