Coronary Artery Dissection in a Woman With Previous Systemic Lupus Erythematosus Using Oral Contraceptive Pills

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Abstract- Spontaneous coronary artery dissection (SCAD) is a rare but devastating cause of the acute coronary syndrome, malignant arrhythmias, and sudden cardiac death. It mainly affects young, middle-aged and otherwise healthy women. Oral contraceptive pills (OCP) and connective tissue disease are known as predisposing factors for SCAD. Here, we present a 43-year-old woman with a history of systemic lupus erythematosus (SLE), using OCP came with typical chest pain. With diagnosing inferior ST-elevation myocardial infarction, fibrinolytic therapy was done which aggravated her chest pain. Finally, the diagnosis of SCAD was proven by angiography and stenting was done. On the 6th day of her hospitalization, tachycardia occurred again, and trans-esophageal echocardiography was performed for the patient who showed partially flail anterior mitral leaflet. She was discharged from hospital after mitral valve replacement. This is a great dilemma in the management of a young woman with a history of connective tissue disease or vasculitis, like our patient who wants a contraceptive method.

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Introduction

Spontaneous coronary artery dissection (SCAD)-first described in 1931- is a rare but devastating cause of the acute coronary syndrome, malignant arrhythmias and sudden cardiac death (1). It mainly affects young, middle-aged and otherwise healthy women. According to previous investigations, the incidence of SCAD is 0.28-1.1% (2). It seems that the incidence of this condition is underestimated because some patients develop sudden cardiac death before a definite diagnosis. Depending on the type of coronary vessel involvement, the extent of dissection and pre-existing atherosclerotic disease, SCAD has a variable range of clinical presentations and outcome such as chest pain alone to an ST-segment elevation myocardial infarction (STEMI), ventricular fibrillation, and sudden death (3). Therefore it is important to consider this diagnosis in young women presented with ACS equivalents even in the absence of STEMI to perform early diagnostic (coronary angiography and intravascular ultrasound (IVUS)) and therapeutic workup (medical management, coronary artery stenting or surgical bypass grafting) (4). According to Tanis *et al*., there are 4 types of SCAD which are named as peripartum; atherosclerotic; idiopathic; and related to other causes and conditions (such as connective tissue diseases (e.g., SLE), vigorous exercise and cocaine abuse) (5). About 80% of SCAD occurred in women that 50% of them seen in the peripartum period or in association with oral contraceptive use. Few articles have reported SCAD due to use of hormone replacement therapy after menopause and other conditions with high estrogen level like cirrhosis of the liver (5).

This higher incidence of SCAD in hyper-estrogenic conditions may be due to the effect of estrogen on a medial layer of coronary arteries and hemodynamic changes.

Here, we report a 43-year-old woman with the history of OCP usage presented with typical chest pain, diagnosing inferior MI, underwent PCI on RCA due to RCA dissection.

Case Report

A 43-year-old woman with a history of PSVT-taking

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Verapamil 40 mg per day candidate for EPS-ablation was admitted to emergency department with typical chest pain, shortness of breath, nausea, cold diaphoresis lasting for 10-15 minutes, and fall due to a decreased level of consciousness.

In her past medical history, she explained a history of systemic lupus erythematosus that was treated with Prednisolone 5 mg daily, four methotrexate tablets on Fridays and calcium and vitamin D tablet daily.

Recently oral contraceptive pills (OCP) had been prescribed for her because of abnormal uterine bleeding.

On admission, her vital signs were stable (blood pressure 120/80 mmHg, pulse rate 82 beats per minute, SpO2 95% in room air). Her physical exam was within normal limit. Table 1 shows laboratory findings of the patient.

Table 1. Laboratory findings of the patient

Variable	Value	Variable	Value
Troponin I	0.3 ng/ml	Cholesterol	132 mg/dl
White blood cell	15300/mm3	Triglyceride	88 mg/dl
Hemoglobin	11.7 g/dl	HDL	45 mg/dl
Platelet count	339000/mm3	serum Na	139 mmol/l
Creatine phosphokinase	2265 IU/L	serum K	4.4 mmol/l
Creatine kinase-MB	226 IU/L	Lactate dehydrogenase	1657 IU/L

In the emergency department, she received Reteplase with the diagnosis of inferior STEMI because percutaneous intervention (PCI) was not available in the next 60 minutes. After one hour of Reteplase administration, her chest pain continued, and ST elevation was increased on ECG. Therefore, angiography was performed for her 90 minutes after Reteplase administration in which RCA dissection was diagnosed (Figure 1).

Figure 1. Coronary angiography shows dissection of the right coronary artery

PCI on RCA was performed for her immediately and her chest pain and ECG changes improved (Figure 2).

On the 6th day of her hospitalization, tachycardia occurred again and TEE was performed for the patient who showed hyperdynamic heart, left ventricular enlargement with moderately reduced left ventricular systolic function, left atrial enlargement, partially flail anterior mitral leaflet, severe encircling posterior directed mitral regurgitation, moderate tricuspid regurgitation, severe pulmonary hypertension, mild bilateral pleural effusion and left ventricular ejection fraction of 40%. Consultation with cardiac surgery service was done to emergent mitral valve replacement (MVR). After MVR, her hemodynamic condition became stable, and the patient was discharged from the hospital four days after surgery. In six months follow up, she did not have any problem.

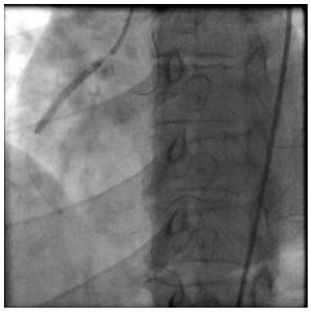

Figure 2. Stent insertion is done by balloon inflation

Discussion

In this case, two risk factors of coronary artery dissection were present, connective tissue disease and estrogen using by OCP pills. Should we avoid using OCP in young women with SLE?

This is a great dilemma in the management of a young woman with a history of connective tissue disease or vasculitis, like our patient who wants a contraceptive method.

The common factor among all the risk factors that discussed in previous studies was an imbalance between hemodynamic stress on the coronary vessel wall and endovascular integrity.

Abnormal vascular integrity was expressed in

systemic connective tissue diseases (6). There are some reports about SCAD and even spontaneous right extra-cranial internal carotid dissection in patients who used OCP (7). According to previous studies, the physiopathology of these events in OCP users was similar to that associated with pregnancy which was increased wall stress and impairment of vessel wall integrity (4). Despite widespread use of OCP, SCAD occurs rarely in women (8). This suggests the role of other factors like genetic susceptibility and the presence of other underlying diseases such as autoimmunity (9). Also, family history of coronary artery diseases should be kept in mind in work-up of patients. High clinical suspicion is very important in the immediate diagnosis of SCAD. Timely diagnosis and treatment of this condition in a young female are crucial for life-saving. Choose a treatment method in these patients depends on some factors such as the hemodynamic status of the patient, site of dissection, number of involved vessels and the availability of therapeutic facilities (10). Stable patients with limited dissections are good candidates for conservative medical therapy. The role of thrombolytics is controversial. They can be effective by dissolving the intramural clot but they can be harmful through the expansion of the hematoma and expanding dissection. Based on the Western Denmark Heart Registry Study (10), percutaneous coronary intervention (PCI) was the method of choice in RCA involvement as our patient was. In some patients especially who with main stem or multivessel involvement, coronary artery bypass grafting can be a good choice.

In conclusion, SCAD should be considered in a young to middle-aged female without traditional risk factors of coronary heart disease as the cause of acute coronary event especially in the presence of positive family history of coronary events, OCP using or being in peripartum period or having an underlying diseases such as vasculitis or autoimmune disease.

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