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Acute coronary syndrome secondary to spontaneous dissection of left internal mammary artery by-pass graft nine years after surgery

Ostry zespół wieńcowy w następstwie samoistnej dyssekcji pomostu z lewej tętnicy piersiowej wewnętrznej w 9. roku po operacji

Ahmet Karabulut[1], Suleyman Tanriverdi[2]

[1]Department of Cardiology, Istanbul Medicine Hospital, Istanbul, Turkey
[2]Department of Cardiovascular Surgery, Istanbul Medicine Hospital, Istanbul, Turkey

Abstract

Spontaneous left internal mammary artery (LIMA) dissection is an extremely rare condition. It generally occurs as a complication of interventional manipulation in the early post-operative period. Here we present a case of spontaneous LIMA dissection nine years after surgery seemed to be chronic deforming jetflow secondary to kinking segment of LIMA. Kinking of LIMA usually occurs in the intraoperative period during harvesting of LIMA, and usually gives symptoms in the early post-operative period. Such a time delay for the progression of spontaneous dissection has not previously been reported.

Key words: spontaneous dissection, left internal mammary artery

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CASE REPORT

A 59 year-old woman was admitted to the emergency department with central and severe chest pain. She had undergone coronary artery bypass grafting nine years ago. She had been taking perindopril 5 mg for hypertension. She had been asymptomatic until a month ago. She had complained of recurrent chest pain on exertion and sometimes at rest for the last month. Eventually, she experienced severe and progressive chest pain of three hours' duration which had begun when she was resting. Electrocardiography showed absence of R progression on precordial derivation and pathological Q wave and 1 mm ST elevation in inferior derivation. Her blood pressure was 170/100 mm Hg and heart rate was 90/min. She was overweight (84 kg, body mass index: 34 kg/m^2) but physical examination was unremarkable. Troponin I was slightly elevated at 1.27 ng/dL (normal < 1 ng/dL) and CK-MB level was within the normal range. Echocardiography showed heavy hypokinesia of the inferior, anterior, middle and apical segments of the septum. The basal segment of the septum and the basal segment of the posterior wall were akinetic, and ejection fraction (measured using Simpson's method) was 30%. There was mild enlargement of the left ventricular and left atrial cavity (left ventricular diastolic diameter: 57 mm, left atrial antero-posterior diameter: 43 mm). There was also mild mitral regurgitation and restrictive type diastolic dysfunction. Coronary angiography revealed total occlusion of the left anterior descending artery (LAD) and circumflex artery (CX) from the proximal segment. There was diffuse en bloc calcification within the course of the right coronary artery (RCA) and also there was 80% stenosis of the mid-RCA (Fig. 1). The saphenous vein graft to the obtuse marginal artery of the CX was patent, but the saphenous vein graft to the RCA was

Address for correspondence:
Ahmet Karabulut, MD, Istanbul Medicine Hospital Department of Cardiology, Hoca Ahmet Yesevi Cad. No: 149, 34203, Istanbul, Turkey, tel: +90 212 489 08 00, fax: +90 212 474 36 94, e-mail: drkarabulut@yahoo.com

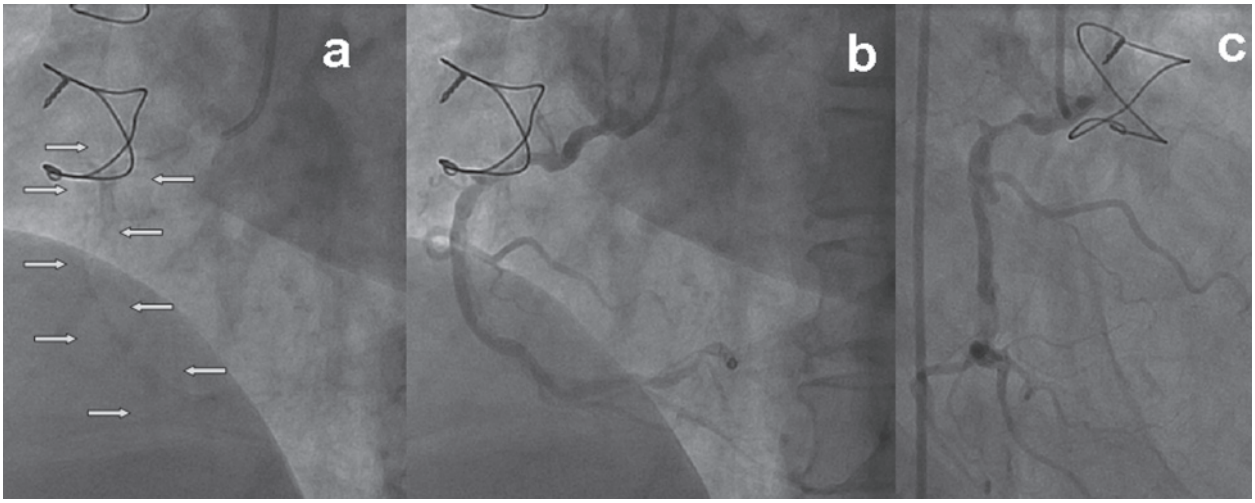

Figure 1. Right and left anterior oblique projection of right coronary artery. There is diffuse en bloc calcification (**A**, indicated with arrows) with middle stenosis (**B**, **C**)

totally occluded. The left internal mammary artery (LIMA) was perfusing the native LAD (Fig. 2). However, just after the proximal segment of LIMA, there was a long ectatic segment with a spontaneous dissection line originating from the proximal LIMA. Dissection was extended to the distal segment of the LIMA (Fig. 3). Because of multi-vessel disease and the length of the dissected segment, surgical revascularisation was preferred as the treatment modality. Two saphenous veins were anostomosed to the middle LAD and the distal RCA subsequently, and after a one week follow-up, the patient was discharged from hospital.

Control echocardiography performed one month after the operation showed a mild improvement in the wall motion of the septum, with the same ejection fraction (30%). The patient was followed asymptomatically for a year with medical treatment.

DISCUSSION

The LIMA dissection generally occurs as a complication of interventional manipulation. Kinking of the LIMA during surgical mobilisation and surgical clip can also cause LIMA dissection [1]. Spontaneous LIMA dissection is an extremely rare condition, with only five cases having been reported [2]. Of the reported cases, dissection had occurred on the basis af atherosclerosis in four cases, and extensive kinking of LIMA was predisposed to dissection in the fifth case [3]. Risk factors for the progression of spontaneous arterial graft dissection have yet to be proposed. The independent risk factors for spontaneous coronary dissection may also apply to graft dissection [4].

Spontaneous coronary artery dissection is usually seen in women, especially in the post-partum period. The fifth decade is a peak period, and other risk factors are arterial hypertension, vasculitis, and connective tissue disorders. Atherosclerosis is another major predisposing factor for spontane-

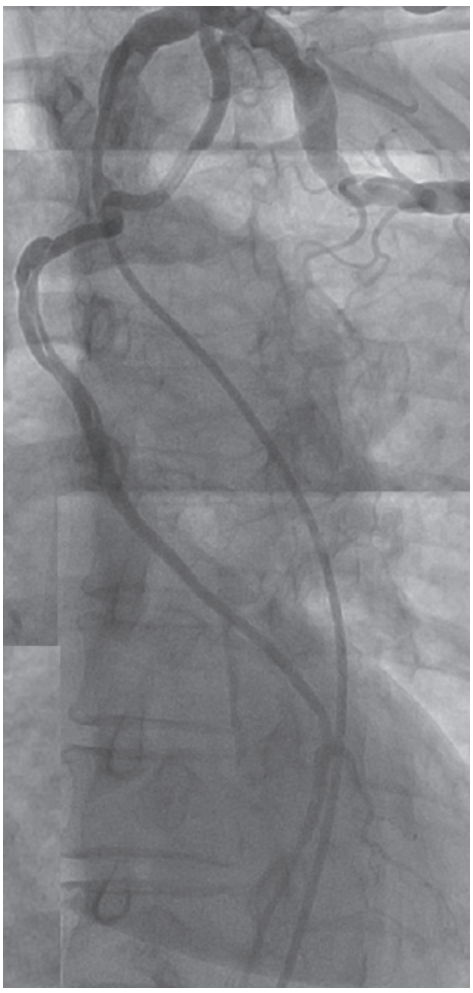

Figure 2. Right anterior oblique projection showing spontaneous dissection line in the mid-left internal mammary artery by-pass graft and left anterior descending artery perfusion (combination of four consecutive images in a single view)

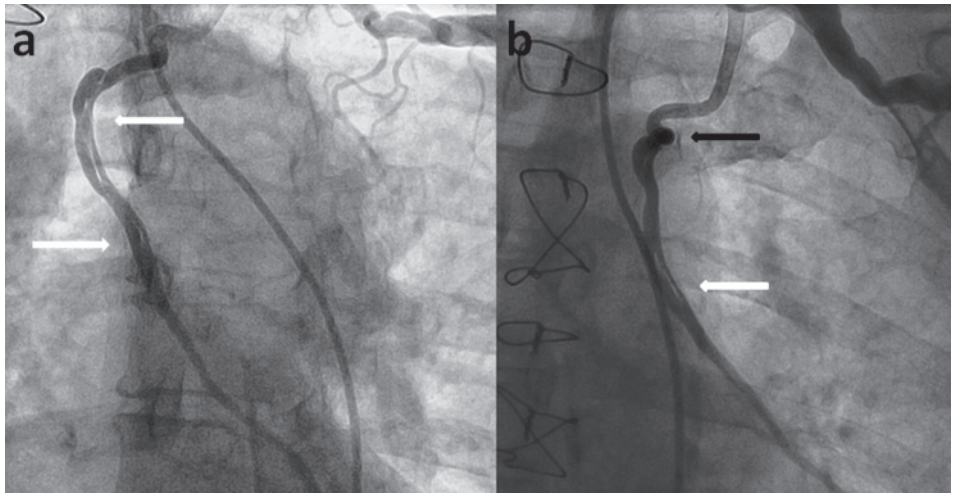

Figure 3. Right anterior oblique projection showing left internal mammary artery (LIMA) by-pass graft. Spontaneous dissection line originating after kinking segment of proximal LIMA and extension to distal segment (**A**, dissection line indicated with white arrow). Left anterior oblique projection showing LIMA by-pass graft. Dissected segment is clearly seen beneath kinking segment (**B**, black arrow indicate kinking segment of LIMA)

ous dissection. Our case was of a hypertensive woman with extensive atherosclerosis in her coronary vessels. However, spontaneous dissection most probably occurred as a result of the deforming effect of jet stream and flow turbulence due to a kinking segment of the LIMA. Selective LIMA angiography showed kinking just after a healthy proximal segment. The disease was limited to the mid-segment of the LIMA. Ectasia in the diseased segment may also indicate the deforming effect of a chronic jet stream. There was no atherosclerotic plaque within the lumen of the LIMA.

Dissection associated with kinking usually appears within the first post-operative year. The only reported case of spontaneous LIMA dissection associated with kinking was diagnosed five years after operation. Our case was operated upon nine years ago and had been asymptomatic over the intervening period. The delaying of dissection formation over such a long period is highly unusual.

In conclusion, spontaneous LIMA dissection is rarely seen and can lead to an acute coronary event. Immediate treatment is crucial.

Conflict of interest: *none declared*

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