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Letter to the Editor

Coronary artery stent fracture with aneurysm formation and in-stent restenosis

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Abstract

Coronary stent fracture is a relatively rare but potentially serious complication of coronary artery stenting. It has been recognised as a cause of in-stent restenosis as well as acute stent thrombosis. Most fractures occur in stents after aggressive post-dilatation, stents implanted in tortuous and calcified lesions, and after cardiac trauma [M.S. Lee, D. Jurewitz, J. Aragon, J. Forrester, R.R. Makkar, S. Kar Stent fracture associated with drug-eluting stents: clinical characteristics and implications. Catheter Cardiovasc Interv. Feb 15 2007;69(3):387–394., Makaryus AN, Lefkowitz L, Lee AD, Coronary artery stent fracture. Int J Cardiovasc Imaging. Jun 2007;23(3):305–309. Electronic publication 2006 Sep 28.,E.S. Brilakis, C. Maniu, M. Wahl, G. Barsness (2004) Unstable angina due to stent fracture J Invasive Cardiol 16 (9):545.,G. Sianos, S. HOfma, J.M. Ligthart et al. Stent fracture and restenosis in the drug eluting stent era. Catheter cardiovasc Interv 2004; 61(1):111–116.]. We report on a case of delayed stent fracture that gradually lead to in-stent restenosis (distal part), significant fragment displacement with the formation of a coronary artery aneurysm that was unsuitable for percutaneous intervention.

Keywords: Stent fracture; Coronary artery aneurysm; In-stent restenosis; Coronary angiography

1. Clinical summary

A 63-year old female with a history of hypertension, elevated blood cholesterol levels and cigarette smoking, who suffered anteroseptal ST elevation myocardial infarction in 2004 and had undergone successful PCI and stent implantation in the acute phase, was admitted for elective cardiac catheterisation due to positive stress ECG test.

In 2004, in the acute phase of myocardial infarction the LAD artery was stented with two stents deployed in the proxymal (Lekton-Motion 3.0/13) and medial (Lekton Motion 3.0/20) segment of the LAD (Figs. 1 and 2) with two stents partially overlapping. RCA was hypoplastic with no significant stenoses, as was the Cx.

ECG after the procedure showed resolution of the ST segment elevation, and slow progression of R waves. Echocardiography showed hypokinetic anteroseptoapical segment of the LV, with preserved systolic function of the left ventricle (EF 50%).

After discharge, the patient was feeling good, and had no retrosternal pain or limitations in normal physical activity. During routine control (2008), a stress ECG was done. During the test, the patient displayed no symptoms but the ECG showed significant ST segment depression in leads V5, V6 and inferior leads that persisted up to 9 min into recovery (Fig. 3). After the stress test, the patient was scheduled for elective cardiac catheterisation.

At the time of admission the patient was taking standard post-MI therapy (beta blocker, ACE inhibitor, aspirin, statin), while she had discontinued clopidogrel one year after the MI. On admission the physical exam was remarkable for a of BP 130/70, pulse 60/min, and respirations were 12/min. The lungs were clear; there were no signs of oedema or jugular venous distention. There were no heart murmurs noted on admission nor was the S3. Lab results including the creatinine and cardiac enzymes were within normal limits. ECG shows sinus rhythm, 55/min., PR interval 0.14 s, left axis deviation, poor R wave progression

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V1–V4, and negative T wave in aVL. Patient was started with clopidogrel and the cardiac catheterization was done.

Cardiac catheterization showed normal left main, LAD showed a clear stent fracture with stent displacement and the formation of a coronary artery aneurysm between the two parts with TIMI III flow in LAD. (Figs. 4, 5 and 6). There was also significant (80%) in-stent restenosis of the distal part of the previously implanted stent. Because of the tortuosity and the aneurysm between two fragments, PCI was not done and the procedure was terminated.

2. Discussion

We reported the case of 63-year old female who was catheterised due to a positive stress ECG test without any symptoms. During the catheterisation the stent fracture was identified with the formation of coronary artery aneurysm between the fragments and in-stent restenosis in the distal fragment that was responsible for the ECG changes during the stress test. Coronary stent fracture is a rare but potentially serious complication of coronary artery stenting. The mechanism that gradually led to stent fracture in most cases was chronic, constant mechanical stress. In most cases, stent fractures were found in stents that were implanted with larger balloons (especially aggressive post-dilatation), stents implanted in tortuous, calcified lesions, overlapping stents and suboptimally positioned stents [1–4]. In this case the probable cause of stent fracture was “milking” of the medial segment of the LAD (seen on the first coronary angiogram) at the point where two stents overlap, with significant mechanical stress that led to stent fracture [5], while the traction between two fragments gradually led to the formation of an aneurysm between the fragments. The in-stent restenosis most probably occurred due to constant mechanical stress of the vessel wall [5,6]. Because of the complex lesion, displacement of the fragments, angulation of the coronary artery and formation of a large coronary artery aneurysm, we decided to continue conservative medical therapy in this patient with regular controls. In the future, if a progression of symptoms is found, coronary artery bypass surgery should be considered.

Fig. 1. Significant stenoses of the proxymal and medial segment of the LAD in acute phase myocardial infarction seen from the RAO 35.

Fig. 2. The same projection (RAO 35) after the implantation of two stents with partial overlapping.

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The authors of this manuscript have certified that they comply with the Principles of Ethical Publishing in the International Journal of Cardiology [7].

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