THE ANATOLIAN JOURNAL OF CARDIOLOGY

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Everolimus Eluting Stent-induced Early Giant Multiple Coronary Artery Aneurysm Formation

A 62-year-old male patient presented with dyspnea. The cardiac troponin I (cTn-I) level was found to be 26 pg/mL (0.0-47.34 pg/mL) in the patient, with no significant ischemic change in his electrocardiography. It was learned that the patient had a history of hypertension, diabetes mellitus, and Behçet's disease without follow-up and treatment. Echocardiography showed ejection fraction EF 30% and left ventricular global hypokinesia with dilatation. Diagnostic coronary angiography revealed a 70% stenosis in the mid part of the left anterior descending artery (LAD) with normal other coronary arteries. After a 2.5 × 20 mm balloon pre-dilatation, a 3.0 × 28 mm Everolimus-Eluting Platinum Chromium Coronary Stent System (Promus PREMIER, Boston Scientific) was implanted in the LAD. Post-dilatation was performed with a 3.5 × 15 mm non-compliant balloon at 14 atm and there was no significant residual stenosis (Figures 1a-d) (Video 1).

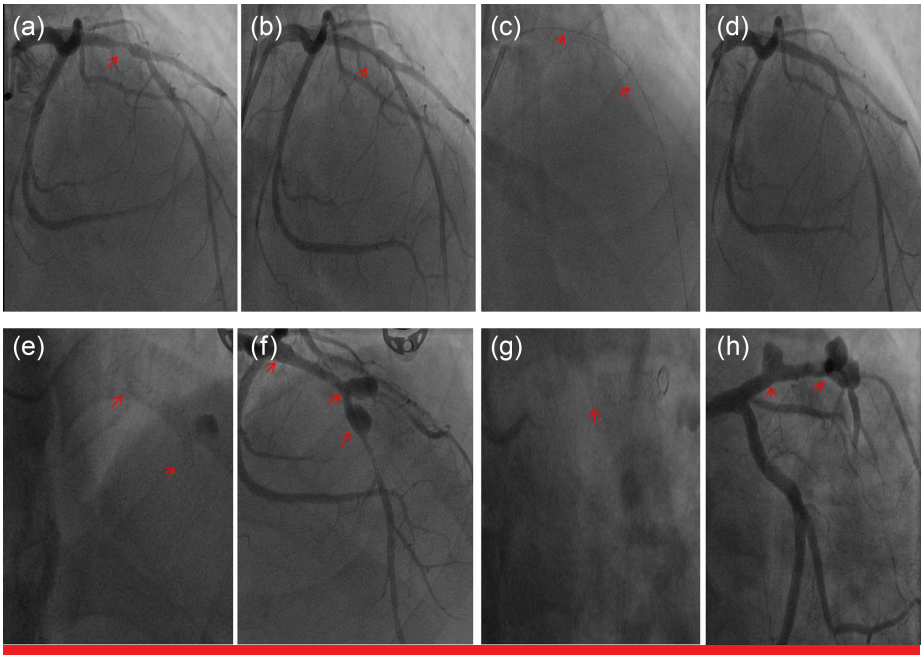

Figure 1. a. Image of 70% stenosis in the middle part of the left anterior descending artery (LAD) in angiographic anteroposterior cranial view, b. Adjustment view of the stent for stenosis in LAD with contrast, c. Adjustment view of the stent for stenosis in LAD without contrast, d. Image of LAD after stenting in anteroposterior cranial view, e. Non-contrast image of the stent in the LAD, f. Anteroposterior cranial angiographic view showing giant aneurysms in the proximal and distal parts of the LAD stent and the osteal part of the diagonal artery branch originating from the instent, g. Non-contrast anteroposterior caudal angiographic view the proximal part of the stent in the LAD, h. Anteroposterior caudal angiographic view showing giant aneurysm in the proximal of the LAD stent.

E-PAGE ORIGINAL IMAGE

Murat Akçay
Metin Çoksevim

Department of Cardiology, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Türkiye

Corresponding author:
Murat Akçay
✉ drmuratakcay@hotmail.com

Cite this article as: Akçay M, Çoksevim M. Everolimus eluting stent-induced early giant multiple coronary artery aneurysm formation. *Anatol J Cardiol.* 2024;28(9): E-29-E-30.

DOI:10.14744/AnatolJCardiol.2024.4623

Twenty-eight days later, he admitted the typical chest pain, and cTn-I level was found to be 1250 pg/mL (0.0-47.34 pg/mL). In control coronary angiography, giant aneurysms were seen in the proximal and distal parts of the previously placed LAD stent and in the ostial part of the diagonal artery branch emerging from the stent (Figures 1d-f) (Video 2). The patient was referred for emergency coronary bypass graft surgery. Written informed consent was obtained from the patient for the publication of this case report.

Coronary artery aneurysm (CAA) is described as more than 50% dilatation of the reference coronary artery segment diameter.[1] If the CAA diameter is more than 4 times the normal coronary segment or the diameter is more than 20 mm, it may be described as a giant CAA.[2-4] Acquired CAA may happen due to atherosclerosis, Kawasaki disease, Takayasu arteritis, other connective tissue diseases, infections, trauma, percutaneous coronary intervention (PCI), and drug-eluting stent (DES) implantation.[1,5] Improvement of CAA after DES implantation is an infrequent complication. The possible mechanism of aneurysm formation is hypersensitivity and inflammatory reactions induced by the stent polymer. Although the stent polymers are highly tissue compatible, they can rarely stimulate a local severe inflammatory response with eosinophils and lymphocytes, including all three arterial layers, leading to aneurysm formation.[6-8] Also, four autopsies exposed intra-stent eosinophilic infiltrate, thrombosis, and lack of intimal improvement. However, studies have shown that allergies to stents (such as nickel, stainless steel, and cobalt-chromium metals) increased in-stent restenosis, not predisposed to CAA formation. The optimal treatment method for DES-related coronary aneurysms is unknown. Covered stents or bypass operations may be indicated large or enlarging CAAs, due to the risk of coronary artery rupture risk.[5-9] Our case is unusual due to Everolimus-eluting stent-related early-time, multiple giant CAA development.

Informed Consent: Written informed consent was obtained from the patient for the publication of this case.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: The authors declare that this study received no financial support.

Video 1: Imaging of diagnostic coronary angiography and left anterior descending artery (LAD) stenting procedure

Video 2: Imaging of control coronary angiography, twenty-eight days after the first angiography

REFERENCES

1. Kaya C, Asil S, Cesaretli S, Yavaş Y, Buğan B, Barçın C. Early-period coronary aneurysm formation after sirolimus-eluting stent implantation. *Anatol J Cardiol*. 2023;27(11):E34-E35. [CrossRef]
2. Kadakia MB, Epps KC, Julien ME, et al. Early aneurysm formation after everolimus-eluting stent implantation. *Circ Cardiovasc Interv*. 2014;7(2):266-267. [CrossRef]
3. Joo HJ, Woong Yu C, Choi R, et al. Clinical outcomes of patients with coronary artery aneurysm after the first-generation drug eluting stent implantation. *Catheter Cardiovasc Interv*. 2018;92(3):E235-E245. [CrossRef]
4. Oliveira DC, Oliveira CGC, Miranda VN, Gadelha MI, Filho JBS, Very Early JB. Very Early coronary artery aneurysm after primary percutaneous coronary intervention in patient with HIV and thrombophilia. *Cardiol Res*. 2019;10(5):312-317. [CrossRef]
5. Abou Sherif S, Ozden Tok O, Taşköylü Ö, Goktekin O, Kilic ID. Coronary artery aneurysms: a review of the epidemiology, pathophysiology, diagnosis, and treatment. *Front Cardiovasc Med*. 2017;4:24. [CrossRef]
6. Virmani R, Guagliumi G, Farb A, et al. Localized hypersensitivity and late coronary thrombosis secondary to a sirolimus-eluting stent: should we be cautious? *Circulation*. 2004;109(6):701-705. [CrossRef]
7. Gupta A, Chhikara S, Datta R, Vijayvergiya R. Everolimus- Eluting stent causing coronary artery aneurysm in 7 days: 3D-OCT findings and management. *J Invasive Cardiol*. 2020;32(11): E301-E302.
8. Christou AH, Papadakis EC, Nikolaou NI, Antonatos DG, Anadiotis AV, Patsilinakos SP. Multiple coronary micro-aneurysm formation after drug-eluting stent implantation. *Hellenic J Cardiol*. 2016;57(3):191-193. [CrossRef]
9. Sajja LR, Mannam G, Kamtam DN. Surgical management of drug-eluting stent associated coronary artery aneurysms: a case series. *Indian J Thorac Cardiovasc Surg*. 2023;39(2):182-185. [CrossRef]