Images in CAD

Coronary Artery Disease 2014, **00**:000–000

A rare case of Prinzmetal angina 3 days after coronary artery stenting with a second-generation drug-eluting stent

Vincenzo Sucato, Angela Sansone, Salvatore Evola, Giuseppina Novo, Giuseppe Coppola, Egle Corrado, Antonino Rotolo, Giuseppe Andolina, Salvatore Novo and Pasquale Assennato, Biomedical Department of Internal Medicine and Specialties (DiBiMIS), Division of Cardiology, Paolo Giaccone Hospital, University of Palermo, Palermo, Italy

Correspondence to Vincenzo Sucato, MD, Biomedical Department of Internal Medicine and Specialties (DiBiMIS), Division of Cardiology, Paolo Giaccone Hospital, University of Palermo, Via Del Vespro no. 129, 90127 Palermo, Italy
Tel: +39 091 655 4301; fax: +39 091 655 4304; e-mail: odisseos86@alice.it

Received 27 June 2014 **Revised** 10 August 2014 **Accepted** 11 August 2014

Case report

In the literature, several cases have been reported of coronary spasms after the placement of a first-generation drug-eluting stent; no reports have been published of spasms in relation to a second-generation drug-eluting stent designed to decrease neointimal response and more rapid re-endothelialization [1].

A 55-year-old man was admitted to our hospital with acute chest pain. He was a smoker and had a history of hypercholesterolemia. Coronary angiography (CAG) showed 90% stenosis in the mid-right coronary artery (RCA) and a moderate occlusion of the left anterior descendant artery, for which stenting was performed using a everolimus-eluting (XIENCE PRIME; Abbott Vascular, California, USA) stent (3.5 × 28 mm; Abbott Vascular) and then postdilating with a TREK balloon (4 × 8 mm) (maximum diameter > 4.25 mm) (Fig. 1). He was discharged after 1 day of observation. However, the patient had similar complaints of chest pain 3 days later; therefore, he was again admitted to our hospital. ECG showed transient ST elevation of greater than 2 mm in lead II–III–aVF. We performed CAG without an exercise test and without stopping oral vasoactive agents before CAG because we were concerned about the possibility of unstable angina because of the presence of resting chest pain. CAG showed severe vasospasm in the proximal RCA at the proximal edge of the previously implanted stent; no other significant lesions were present to account for the resting chest pain. The spasm was completely relieved by an intracoronary nitroglycerine injection during CAG, and also the chest pain and the ECG changes (Fig. 2). CAG also showed slow flows (TIMI II). The patient had taken aspirin, ticagrelor, rosuvastatina, and metoprolol. Because coronary spasm was found, a calcium channel antagonist (nifedipine 30 mg/day) was added to antiangina medication after recovery. On follow-up, the patient has had no recurrence of chest pain at rest.

The rates of angiographic in-stent restenosis, target lesion, and target vessel revascularization are significantly lower with drug-eluting stents. However, the specter of serious, rare idiosyncratic reactions to stents, particularly drug-eluting stents with polymer and active pharmacologic constituents, remains a concern [2]. To date, documented vascular compatibility issues include rare hypersensitivity reactions and persistent abnormal vasomotor responses in the drug-eluting stented vessel. If the drug-eluting stent system is the cause of the spasm, it could potentially be a reaction to the stainless-steel stent platform, the polymers, or the medications released [3]. It is unlikely to be the stainless-steel platform, given the large number of bare-metal stents used worldwide and the paucity of similar reports of diffuse spasm. Endothelial dysfunction may be because of a direct toxic effect of the released drug, an acute or delayed hypersensitivity reaction (Kounis syndrome) to the drug or the polymer, or impaired or absent re-endothelialization after percutaneous coronary intervention barotraumas [4]. In particular, RCA appears to be affected by the spasm. In our case, the entire RCA, upstream and downstream of drug-eluting stent, is spastic. The cause of this particular sensitivity is not yet clear. Currently, vasospastic angina is treated with a combination of different classes of calcium channel blockers and nitrates.

Acknowledgements

Conflicts of interest

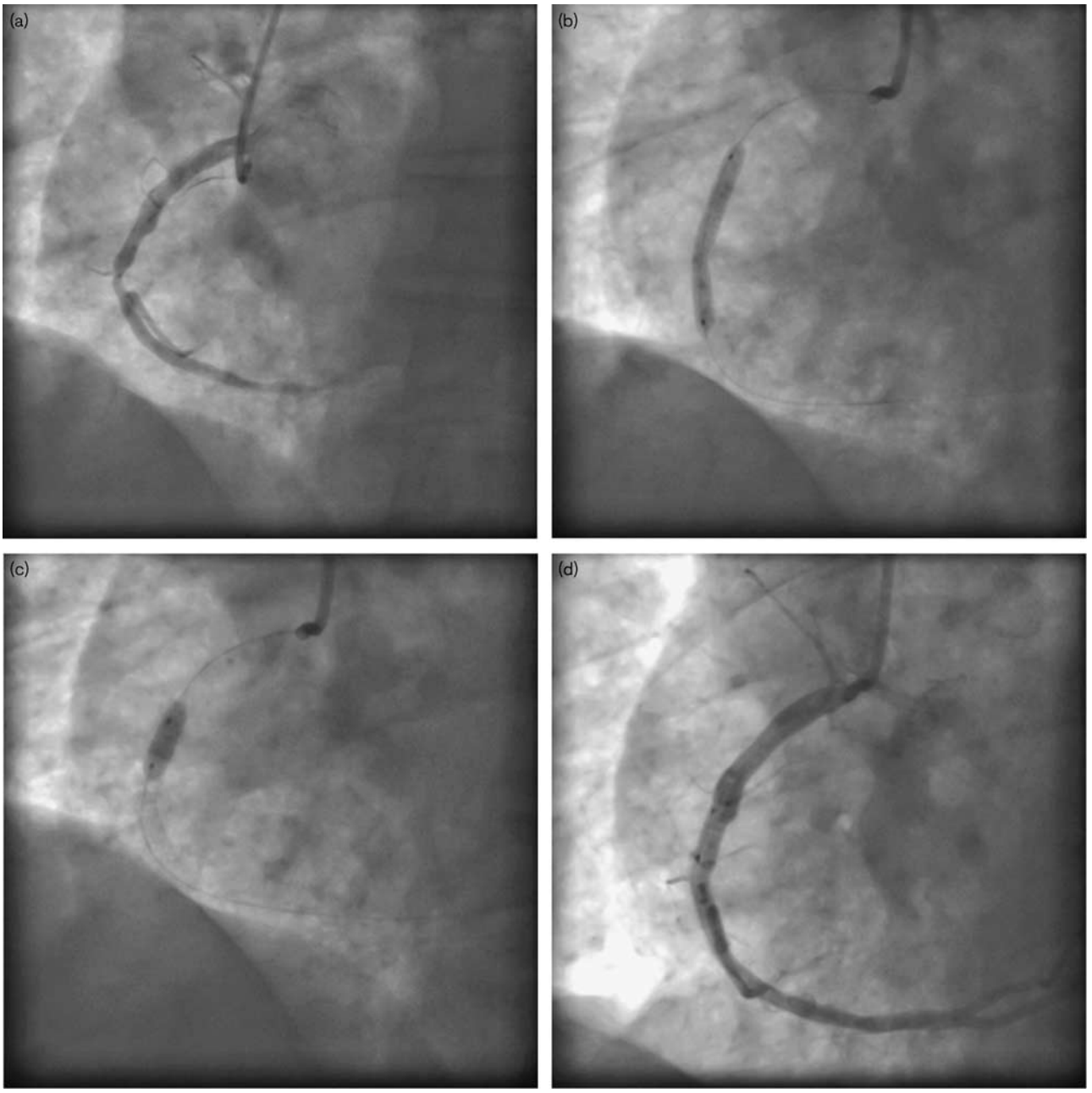
None declared.

References

1 Hofma SH, van der Giessen WJ, van Dalen BM, Lemos PA, McFadden EP, Sianos G, *et al.* Indication of long-term endothelial dysfunction after sirolimus-eluting stent implantation. *Eur Heart J* 2006; **27**:166–170.
2 Togni M, Windecker S, Cocchia R, Wenaweser P, Cook S, Billinger M, *et al.* Sirolimus-eluting stents associated with paradoxic coronary vasoconstriction. *J Am Coll Cardiol* 2005; **46**:231–236.
3 Brott BC, Anayiotos AS, Chapman GD, Anderson PG, Hillegass WB. Severe, diffuse coronary artery spasm after drug-eluting stent placement. *J Invasive Cardiol* 2006; **18**:584–592.
4 Kounis NG, Hahalis G, Theoharides TC. Coronary stents, hypersensitivity reactions and the Kounis syndrome. *J Interv Cardiol* 2007; **20**:314–323.

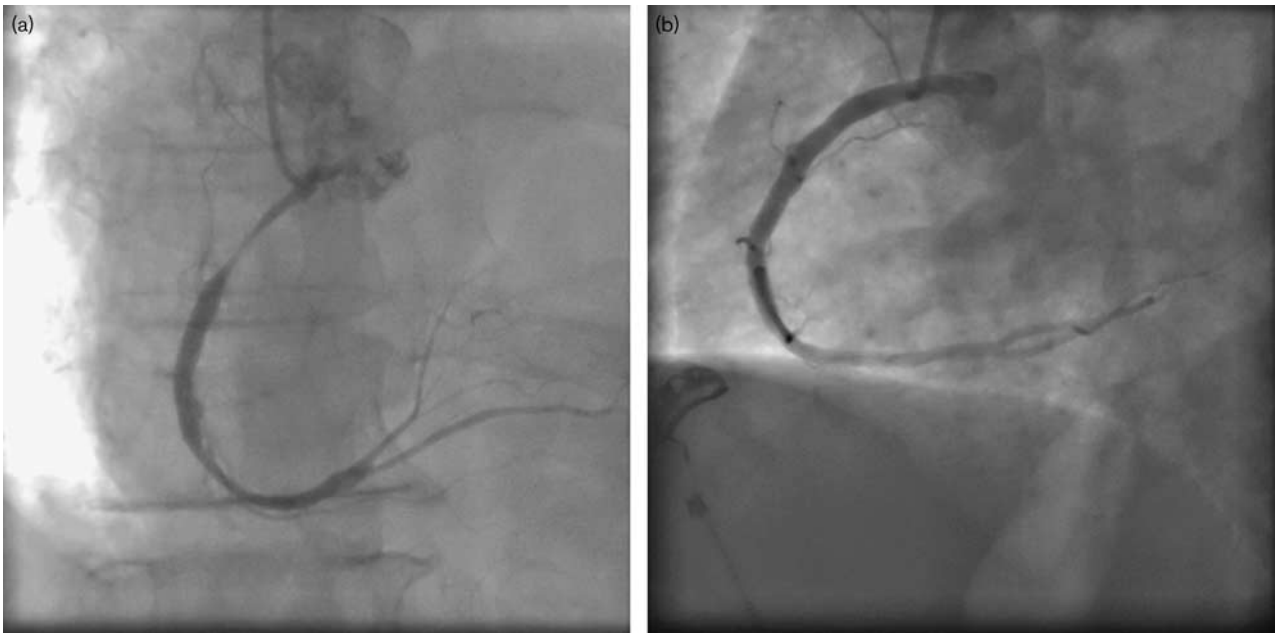
DOI: 10.1097/MCA.0000000000000172

Fig. 1



First percutaneous coronary intervention. (a) Coronary angiography showed 90% stenosis in the mid-right coronary artery; (b) stenting was performed using a everolimus-eluting stent (XIENCE PRIME; Abbott Vascular); (c) and then postdilating with a TREK balloon (4 × 8 mm). (d) The procedure was completed with good results.

Fig. 2



(a) Right coronary angiogram with coronary spasm of segment 1 is observed before infusion just proximal to the everolimus-eluting stent; (b) right coronary artery after an intracoronary infusion of isosorbide dinitrate: the coronary spasm has resolved completely.

AUTHOR QUERY FORM

LIPPINCOTT
WILLIAMS AND WILKINS

JOURNAL NAME: MCA
ARTICLE NO: cad_d_14_00220
QUERIES AND / OR REMARKS

QUERY NO.	Details Required	Author's Response
Q1	A running head short title was not supplied; please check if this one is suitable and, if not, please supply a short title of up to 40 characters that can be used instead.	
Q2	Please provide the city name for 'Abbott Vascular'.	
Q3	Please check and confirm whether the expansion for 'CAG' as 'coronary angiography' is correct.	
Q4	Please provide the details of 'the conflicts of interest disclosure'. If there is nothing to declare, please provde a statement to that effect.	
Q5	References have been validated using PubMed. Hence, please confirm whether the insertion of missing elements for all journal references is OK.	