



## CASE REPORT

# Coronary artery aneurysm formation following implantation of a bioresorbable vascular scaffold for in-stent restenosis



Marcos García-Guimaraes\*, Javier Cuesta, Teresa Alvarado, Fernando Rivero, Teresa Bastante, Amparo Benedicto, Fernando Alfonso

Cardiology Department, Hospital Universitario de La Princesa, Madrid, Spain

Received 5 April 2016; accepted 15 May 2016

Available online 31 May 2017

### KEYWORDS

Optical coherence tomography;  
Bioresorbable vascular scaffolds;  
In-stent restenosis;  
Coronary artery aneurysm

**Abstract** Coronary artery aneurysm (CAA) formation is a rare complication of coronary intervention that may develop after implantation of bare-metal or drug-eluting stents. The etiology of this entity appears to be multifactorial and its prognosis is poorly understood, but it has been associated with an increased risk of stent thrombosis. To date few cases of CAAs related to bioresorbable vascular scaffold (BVS) implantation have been reported, and the development of CAA after BVS implantation for the treatment of in-stent restenosis (ISR) has not been previously described. Here we present two cases of CAA formation after BVS, which represent the first demonstration of CAA formation after the use of BVS for ISR.

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### PALAVRAS-CHAVE

Tomografia de coerência ótica;  
Suportes vasculares biorreabsorvíveis;  
Reestenose *intra-stent*;  
Aneurisma coronário

**Desenvolvimento de aneurisma coronário após o implante de *scaffold* reabsorvível como tratamento de reestenose *intra-stent***

**Resumo** A formação de um aneurisma coronário (CAN) é uma complicação rara após intervenções coronárias. O CAN pode se desenvolver após *stent* convencional (BMS) e implante de *stent* farmacológico (DES). A etiologia desta patologia parece ser multifatorial e o prognóstico permanece mal elucidado, mas tem sido associado com um aumento do risco de trombose de *stent*. Até à data, apenas alguns casos de CAN relacionadas com *scaffold* bioabsorvível (BVS) foram relatados. O desenvolvimento de CAN após o implante de um BVS para o tratamento da

\* Corresponding author.

E-mail address: [marcos.garcia.guimaraes@gmail.com](mailto:marcos.garcia.guimaraes@gmail.com) (M. García-Guimaraes).

reestenose *intra-stent* (ISR) não foi anteriormente descrito. Aqui apresentamos dois casos de formação CAN após a BVS, que representam a primeira demonstração de formação CAN após o uso da BVS para ISR.

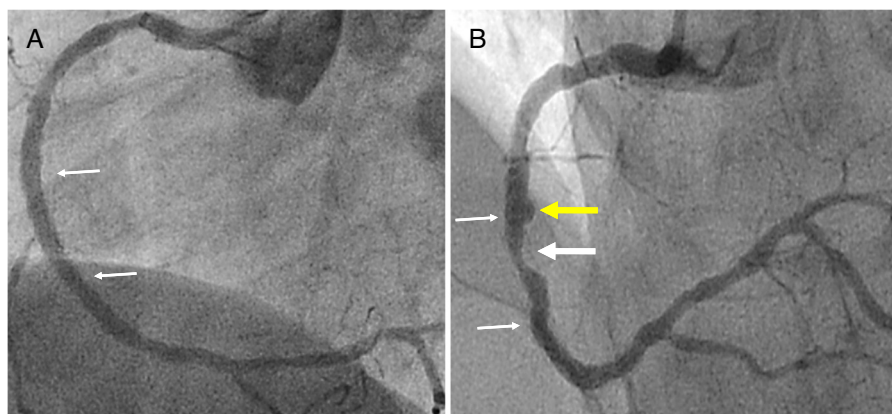
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## Case 1

A 45-year-old man with previous history of hyperlipidemia was admitted with an inferior myocardial infarction requiring implantation of a drug-eluting stent (DES) in the mid right coronary artery. One year later he presented with angina and angiography demonstrated severe in-stent restenosis (ISR). After lesion predilation with a cutting balloon, a 3.5 mm×18 mm bioresorbable vascular scaffold (BVS) (Absorb, Abbott Vascular, CA) was implanted and postdilated up to 24 atm using a non-compliant balloon, with an excellent final result (Figure 1A). Optical coherence tomography (OCT) confirmed appropriate expansion and apposition of the BVS, with a minor intimal dissection at its proximal edge. The patient remained completely asymptomatic, but at nine months underwent a scheduled angiography that revealed moderate ISR of the BVS. In addition, a coronary artery aneurysm (CAA) was detected immediately proximal to the BVS location (Figure 1B). OCT showed the presence of an heterogeneous pattern of neointimal hyperplasia (Figure 2A and B) and confirmed the origin of the CAA immediately proximal to the BVS edge (Figure 2C and D). Interestingly, a minor rupture with intraluminal thrombus was also detected at the origin of the CAA. As fractional flow reserve was 0.79 and instantaneous wave-free ratio was 0.93, and the patient denied any symptoms, the lesion was not treated. During follow-up, a stress echocardiogram was negative.

## Case 2

A 67-year-old man with hyperlipidemia was admitted for effort angina. Fifteen years before he had suffered an anterior myocardial infarction and a bare-metal stent (BMS) was implanted in the proximal left anterior descending coronary artery. Coronary angiography revealed proliferative ISR involving the proximal segments of the BMS but also extending 10 mm into the proximal vessel. OCT depicted severe neoatherosclerosis, with heavily calcified plaques, and a thin-cap fibroatheroma in the proximal segment. After aggressive lesion predilation the entire segment was covered with a 3.5 mm×23 mm BVS (Absorb, Abbott Vascular, CA), postdilated using a non-compliant balloon up to 24 atm, with an excellent final result (Figure 3A and B). OCT confirmed correct BVS expansion with a small residual coronary dissection behind the BVS and at its proximal border. The patient remained completely asymptomatic but a scheduled control angiogram at nine months revealed the development of a large CAA in the mid portion of the BVS (Figure 3C and D). OCT provided unique additional insights, revealing a CAA 11 mm in length with a maximum lumen area of 27.5 mm<sup>2</sup>. Notably, a striking displacement of the BVS struts was depicted, confirming the occurrence of BVS fracture (Figure 4).



**Figure 1** (A) Coronary angiogram of the right coronary artery showing the result of bioresorbable vascular scaffold implantation (small white arrows); (B) control angiography showing moderate in-stent restenosis (white arrow) and formation of a coronary artery aneurysm (yellow arrow).

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