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Letter to the Editor

Successful use of endothelial progenitor cell capture stents in a coronary artery disease patient with aspirin hypersensitivity who failed initial aspirin desensitization

Man-Hong Jim^{a,*}, Arthur Sze-yue Yung^b, Gloria Kai-yan Tang^b, Katherine Yu-yan Fan^a, Wing-Hing Chow^a^a Cardiac Medical Unit, Grantham, Hospital, Hong Kong^b Department of Medicine, Queen Mary Hospital, Hong Kong

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A 56-year-old man with history of G6PD deficiency and aspirin-induced asthma presented with acute coronary syndrome. He complained of sudden onset of chest pain on the day of admission. Electrocardiography revealed dynamic ST changes in lead V1 and V2; troponon-I level was elevated at 7.05 ng/mL (normal: <0.04 ng/mL); creatinine phosphokinase level was normal. His clinical condition was stabilized with a course of subcutaneous injection of low-molecular-weight heparin (LMWH), clopidogrel, and statin. He was intended for elective coronary intervention 2 weeks after the acute event. Two days prior to intervention, he was scheduled for an aspirin desensitization protocol. A written consent was signed after thorough explanation of the nature, benefit and risk of the procedure. Aspirin was prescribed in escalating doses, starting from 1 mg, 2 mg, 5 mg, 10 mg, 20 mg, 40 mg, and 80 mg every 30 minutes without steroid cover. Vital signs were closely and continuously monitored throughout the procedure inside the coronary care unit. However, at the fifth dose of aspirin (20 mg), patient developed sinus bradycardia (43 beats per minute) and hypotension (60/35 mmHg). In view of possible anaphylactic reaction, the protocol was immediately terminated. Patient was successfully resuscitated after vigorous fluid administration and intravenous atropine injection; no bronchospasm or skin rash was developed.

Coronary angiography was performed subsequently through the right femoral approach. It showed a tight lesion in the mid portion of the left anterior descending artery (LAD) (Fig. 1A) and a focal lesion of 90% diameter stenosis in the proximal portion of the posterior descending artery (PDA) (Fig. 1B). Left ventriculography revealed

normal left ventricular function without regional wall motion abnormality. Ad hoc percutaneous coronary intervention was performed in the usual manner; unfractionated heparin was administered at a dosage of 70 IU/kg, additional dose(s) might be given to maintain an activated clotting time >300 seconds. The LAD was wired with a soft wire; the mid LAD lesion was pre-dilated with a 2.5 × 10 mm balloon inflated at 16 atmospheres (atm). An endothelial progenitor cell (EPC) capture stent, Genous™ R stent, (OrbusNeich Medical Inc., Fort Lauderdale, Florida) 3.0 × 18 mm was deployed at 10 atm; the stent was then post-dilated with a 3.0 × 13 mm non-compliant balloon inflated at 18 atm. The PDA was wired with a soft wire and the PDA lesion was pre-dilated with a 2.5 × 12 mm balloon inflated at 8 atm. A Genous™ R stent 2.5 × 13 mm was deployed at 16 atm. The final results were excellent (Fig. 1C and D). After wound hemostasis, the patient was treated with LMWH and warfarin loading. However, the in-charge physician decided to perform an aspirin desensitization re-challenge, this time the procedure was a successful one. The peri-procedure course was rather uncomplicated. Patient was maintained on aspirin and clopidogrel for 4 weeks without developing allergic reaction; thereafter, aspirin was stopped, and monotherapy of clopidogrel was continued for life. Patient remains uneventful 8 weeks after the discontinuation of aspirin.

Dual anti-platelet therapy (aspirin + thienopyridine derivatives) is mandatory in the prevention of thrombotic complications after stent implantation [1–3], particularly drug-eluting stents, of which a maintenance period of 12 months is currently recommended [4]. Premature withdrawal of one or more of these agents is associated with adverse cardiac events [5,6]. Aspirin hypersensitivity presents either as respiratory (asthma and rhinitis), or cutaneous manifestations (urticaria and angioedema), or anaphylaxis, and is found in up to 10% of populations [7–9]. Unlike other allergic drug reactions, aspirin hypersensitivity is very often not IgE-mediated. Instead, the selective blockade of the COX-1 isoform of the enzyme cyclo-oxygenase leads to shifting of eicosanoid metabolism toward the leukotriene pathway to produce vasoactive and broncho-constrictive substances. The inability to be maintained on aspirin poses a clinical management dilemma to coronary artery patients who require interventions. In light of its importance, various desensitization protocols with small and escalating doses of aspirin spreading over a few hours have been reported with success rate over 90% [7–9]. In this case, the initial failure of aspirin desensitization would mean the use of combination of clopidogrel and anticoagulation, which is reported to have higher ischemic and bleeding complications on long-term maintenance

* Corresponding author. Cardiac Medical Unit, Grantham Hospital, 125 Wong Chuk Hang Road, Hongkong. Tel.: +852 25182619; fax: +852 25188558.

E-mail address: jimmanh2002@yahoo.com (M.-H. Jim).

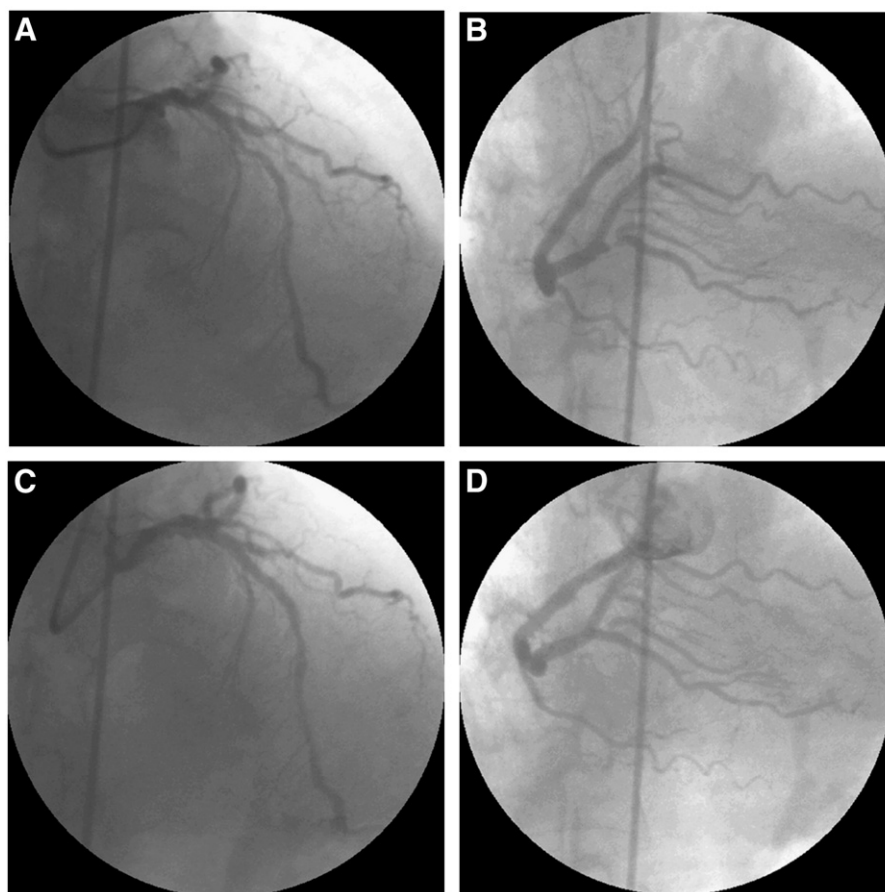


Fig. 1. Coronary angiographic findings: (A) mid LAD critical stenosis; (B) proximal PDA critical stenosis; (C) LAD post-stenting; (D) PDA post-stenting.

compared with dual anti-platelet therapy [2,3]. EPC capture stents are coated with anti-CD34 capable of capturing circulating EPCs to form a thin layer of functional endothelium [10]. Successful use has been reported in clinical conditions which necessitate shortened duration of dual anti-platelet therapy, such as bleeding diathesis and pre-operative revascularization [11,12]. Four weeks of dual anti-platelet therapy is currently recommended [13]. Clinically, the use of EPC capture stents is associated with a very low rate of stent thrombosis and a reasonable rate of target vessel revascularization [13]. This case demonstrated the safety of EPC capture stents in this particular patient subset. Moreover, data on the long-term prognosis of patients after successful aspirin desensitization is still very limited. Some of these patients developed peptic ulcer or gastrointestinal bleeding requiring temporary drug withdrawal and subsequent re-challenge or permanent discontinuation. EPC capture stents, by virtue of expediting re-endothelialization, may be considered appropriate and safe in patients with aspirin hypersensitivity irrespective of the success of desensitization.

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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 [14].

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