Cardiovascular Intervention and Therapeutics (2019) 34:187–188
https://doi.org/10.1007/s12928-018-0530-0

IMAGES IN CARDIOVASCULAR INTERVENTION

A case of stepwise successful reperfusion with a combination of excimer laser coronary angioplasty and rivaroxaban in delayed myocardial infarction with massive thrombus

Hiroki Sugiyama[1] · Kensuke Takagi[1] · Yasuhiro Morita[1] · Hideyuki Tsuboi[1] · Itsuro Morishima[1]

Received: 14 August 2017 / Accepted: 22 May 2018 / Published online: 31 May 2018

Keywords Thrombus · Excimer laser · Aspiration · Acute coronary syndrome

Case

A 53-year-old man was transferred to the emergency department due to continuous chest discomfort for 12 h. Initial electrocardiogram showed abnormal Q waves in leads III and aVF. Coronary angiography showed coronary ectasia and total occlusion of the middle portion of the right coronary artery (RCA) with a massive thrombus (Fig. 1a). Subsequently, percutaneous intervention was performed using a 1.7 mm eccentric excimer laser catheter (ELC). Although repeated aspiration thrombectomies were performed, coronary flow still remained as Thrombolysis in Myocardial Infarction grade (TIMI)-1 in the distal segment of the RCA (Fig. 1b). A 1.4 mm concentric ELC was very slowly advanced toward both the atrioventricular node artery and posterior descending artery, leading to TIMI-2 flow, resulting in slightly CPK/CKMB leakage (Fig. 1c). After intervention, intra-aortic balloon pumping was continuously used with heparin and rivaroxaban 15 mg (b.i.d) for 3 days. Angiography 3 days after, the index intervention demonstrated TIMI-3 flow and decreased thrombus size (Fig. 1d). Coronary computed tomography angiography showed no severe stenosis of the RCA 21 days after the intervention, resulting in dose reduction of rivaroxaban (Fig. 1e).

✉ Itsuro Morishima
morishima-i@muc.biglobe.ne.jp

[1] Department of Cardiology, Ogaki Municipal Hospital, 4-86 Minaminokawa-cho, Ogaki, Japan

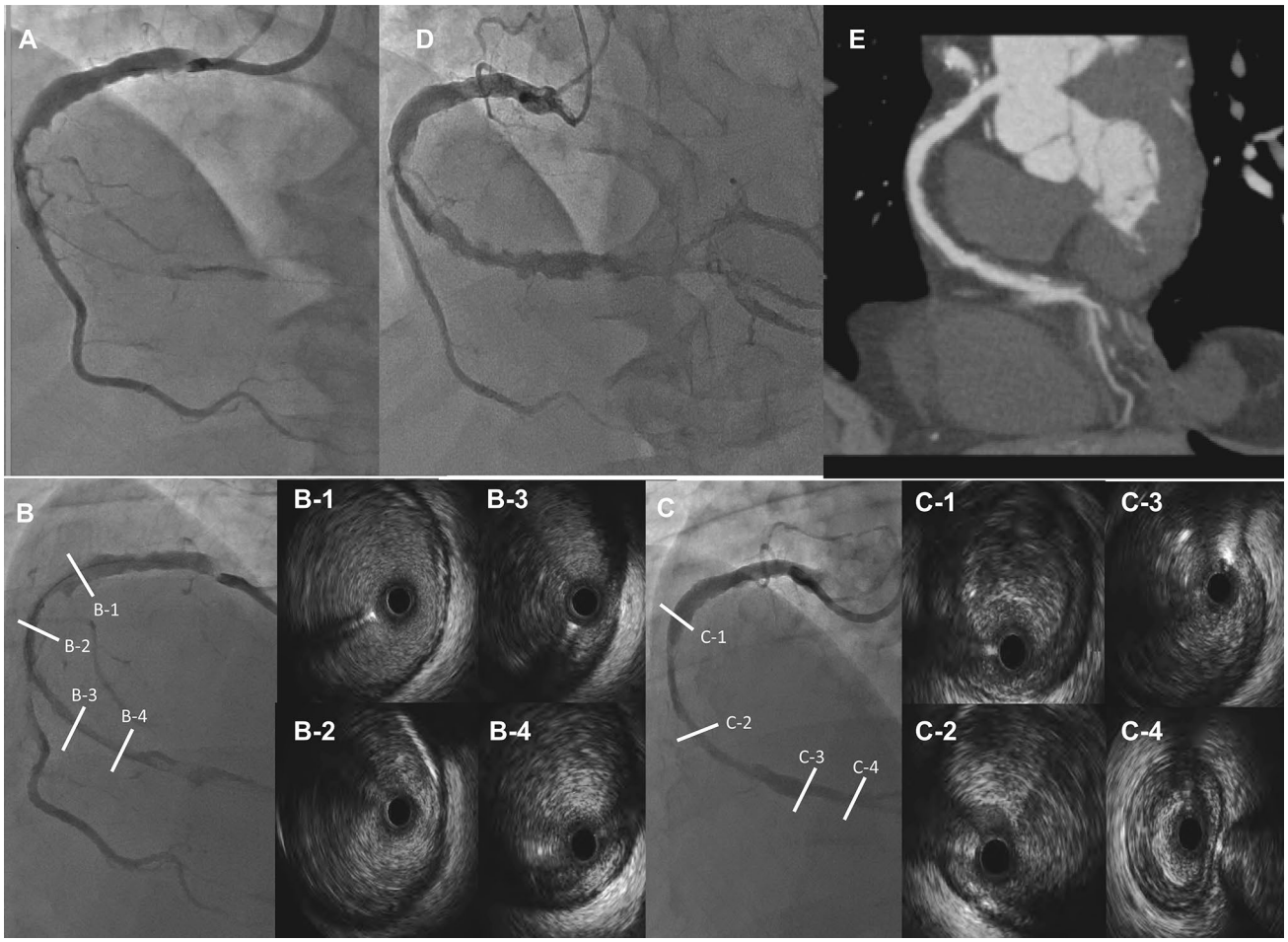

Fig. 1 Angiography, IVUS, and coronary computed tomography findings. **a** Angiography revealed sub-total occlusion of the middle portion of the RCA with ectasia. **b** Angiography and IVUS findings after ELCA, more than 20 sequences (yellow line), using a 1.7 mm eccentric ELCA catheter and aspiration thrombectomy. **c** Final angiography and IVUS after ELCA using a 1.4 mm concentric ELCA catheter to both distal branch, more than ten sequences (red lines); **d** re-angiography 3 days after the intervention; **e** coronary computed tomography angiography 21 days after the intervention. *IVUS* intravascular ultrasound, *RCA* right coronary artery, *ELCA* excimer laser coronary atherectomy

This is the first reported case of effective combination therapy using ELC and direct oral anticoagulation (DOAC) for a patient with a large thrombus of the coronary ectasia. The optimal management of massive coronary thrombi is not known and treatment is usually individualized. Of these, excimer laser coronary atherectomy (ELCA) was reported to have an antiplatelet effect and increase the development of TIMI-3 flow for patients with thrombotic lesions [1]. On the other hand, in Kawasaki disease, a typical cause of coronary ectasia, anticoagulation is thought to be associated with a reduction in adverse coronary events. Although combination therapy with rivaroxaban and dual antiplatelet therapy was reported for the treatment of massive thrombotic lesions, quantitas duplex of rivaroxaban alone was novel despite off-label use for acute coronary syndrome, which is reported to reduce the amount of resistant fibrinolysis of whole blood clots [2]. In conclusion, high-dose rivaroxaban following ELCA and aspiration may be an alternative, effective therapy for massive thrombosis in delayed myocardial infarction.

References

1. Shishikura D, Otsuji S, Takiuchi S, et al. Vaporizing thrombus with excimer laser before coronary stenting improves myocardial reperfusion in acute coronary syndrome. Circ J. 2013;77:1445–52.
2. Varin R, Mirshahi S, Mirshahi P, et al. Whole blood clots are more resistant to lysis than plasma clots—greater efficacy of rivaroxaban. Thromb Res. 2013;131:e100–9.