Cardiovascular Intervention and Therapeutics (2019) 34:178–179
https://doi.org/10.1007/s12928-018-0524-y

IMAGES IN CARDIOVASCULAR INTERVENTION

Entrapment of dissection flap and intimal tissue cleavage during rotational atherectomy

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Received: 12 March 2018 / Accepted: 16 April 2018 / Published online: 26 April 2018

Keywords Rotational atherectomy · Rotablator · Dissection · Complex PCI

A 57-year-old man with unstable angina was referred for rotational atherectomy (RA) percutaneous coronary intervention of a calcified right coronary artery (Fig. 1a). The Rotablator™ (Boston Scientific, Natick, MA, USA) was advanced over a 0.009″ Rotablator™ Floppy wire to the catheter tip. With a rotational speed of 160,000 rpm, a push-forward/pull-back movement of the 1.5 mm burr was performed at less than 15 s per run (Fig. 1b); speed deceleration (> 5000 rpm) was not observed but a transient III degree atrio-ventricular-block occurred. After subsequent burr passage, the device was removed using dynaglide mode; however, an unusual sound was noted by the operator. Angiographic control revealed a severe dissection (Fig. 1c, arrows; online video) with associated flow limitation. Interestingly inspection of the burr revealed the presence of an entrapped dissection flap with intimal tissue (γ: one side of the burr, δ: opposite side of the burr). Subsequent successful deployment of 4 drug-eluting stents restored final TIMI III flow (Fig. 1d).

We showed, for the first time, that the burr during rotational motion may cause entrapment of a dissection flap resulting in cleaving of the arterial intima. This highlights that the coronary dissections after RA may differ from those induced by typical balloon angioplasty. Moreover, according to expert consensus [1], the use of RA in dissection planes is not recommended due to the high risk of extending further the dissection. Indeed the burr preferentially ablates hard inelastic material (such as calcium, fibrous tissue), with sparing of healthy arterial wall, a concept known as differential cutting. However, this ability to cut one material while sparing another may fail when a significant damage of the vessel wall occurs, and in such cases the burr may entrap a dissection flap. Indeed our images clearly show the particular pathological anatomy of vessel dissection caused by the burr passage. Although this phenomenon can occur with a single passage of the burr resulting in a dissection plan, repeated burr passages have a great potential to disrupt a focal coronary dissection. However, in our case it was not possible to establish whether a focal dissection was present before the final burr passage. Coronary dissection is a well-known complication of RA, however the reasons of its occurrence, as in our case, often remain difficult to ascertain. Whether the guidewire sets the cutting vector when the burr advances, the stiff guidewire may be not centrally oriented also in case of short angulations and may bias preferentially to one side of the arterial wall coronary predisposing to dissection during RA.

In conclusion, RA provides excellent plaque modification in calcified coronary lesions, however, burr passage may be complicated by coronary dissection which differs from that

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12928-018-0524-y) contains supplementary material, which is available to authorized users.

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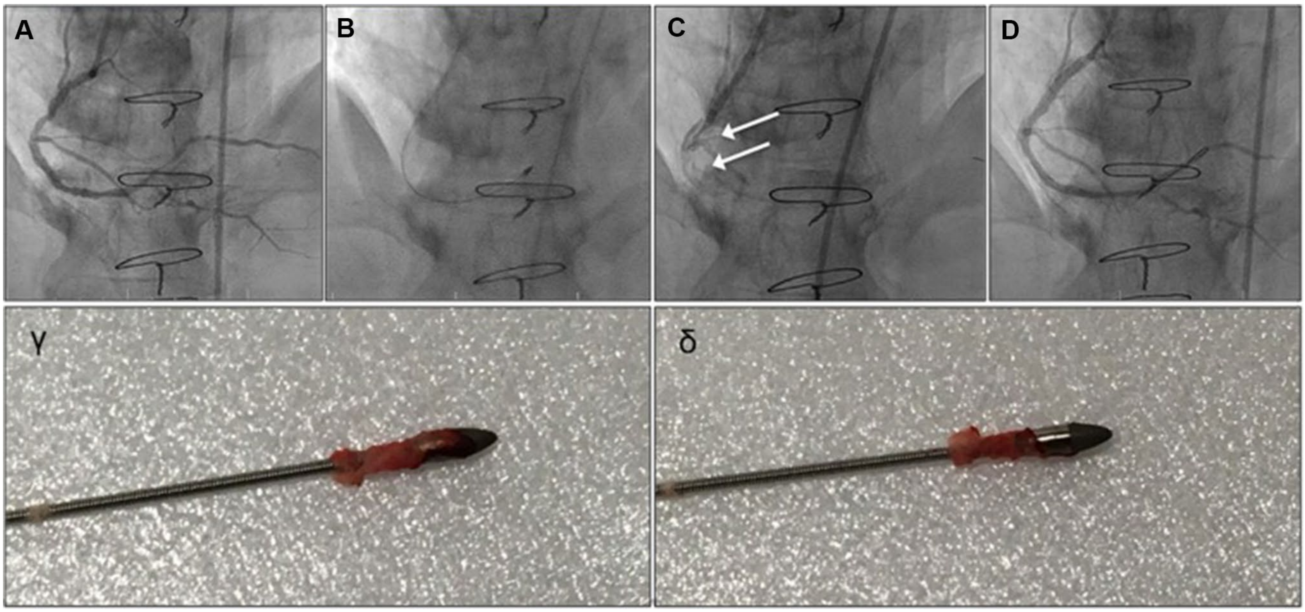

Fig. 1 Coronary angiography of the right coronary artery (**a**); rotational atherectomy (**b**); angiographic control showing severe dissection (arrows) with flow limitation (**c**); successful deployment of 4 drug-eluting stents with restoration of TIMI III flow (**d**); inspection of the burr showing the presence of an entrapped dissection flap (**γ**: one side of the burr; **δ**: opposite side of the burr)

induced by typical balloon angioplasty and may result in cleaving of the arterial intima.

Compliance with ethical standards

Conflict of interest The authors have no conflict of interest to declare.

Reference

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