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Article type: Clinical vignette

Received: February 22, 2020.

Accepted: May 19, 2020.

Published online: May 26, 2020.

ISSN: 0022-9032

e-ISSN: 1897-4279

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Sneaking hematoma beyond the stent implanted for focal stenosis of the right coronary artery: insight from intravascular ultrasound

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Short Title: Sneaking hematoma beyond stent

Total word count: 349 words (main text)

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Final Disclosure: None

Conflict of Interest statement: All authors have no relationships relevant to the contents of this paper to disclose.

Role of the funding source: No funding was received related to this manuscript.
A 74-year-old female with stable angina underwent elective coronary angiography (CAG) revealing severe focal distal right coronary artery (RCA) stenosis (Supplemental figure S1A). Baseline intravascular ultrasound (IVUS) showed a concentric fibro-fatty plaque without calcification, and slight negative remodeling (Supplemental figure S1B). Distal reference diameter was estimated 4.0-mm by IVUS measurement. After pre-dilatation with 3.0-mm balloon, a 4.0/15-mm Zotarolimus-eluting stent (ZES) (Resolute Onyx, Medtronic, Inc, santa Rosa, CA, USA) was implanted followed by post-dilatation with 4.5-mm non-compliant balloon. Final angiography showed excellent result and IVUS confirmed complete stent apposition without edge dissection (Supplemental figure S2B and S2C).

Three hours after the procedure, the patient complained of chest pain and her electrocardiogram showed inferior ST-segment elevation. Emergent CAG revealed occlusive dissection of the proximal RCA (Figure 1A) and IVUS showed extensive hematoma, narrowing the lumen. Based on the IVUS evaluation, two 4.0/38-mm ZESs were implanted with minimal overlap from the mid to proximal RCA. However, despite successful bailout stenting, CAG showed occlusive stenosis distal to the stent implanted at the index procedure, which was previously not present (Figure 1B). IVUS revealed hematoma extending distally beyond the stent (Figure 1C). Based on the IVUS findings, in order to seal the entire segments with extended hematoma, 2 ZESs were additionally implanted overlapping either side (proximal and distal) of the initial stent (proximal: 4.0/12-mm, distal: 3.0/38-mm). Final CAG showed
complete sealing of the hematoma.

Stent implantation can theoretically prevent proximal hematoma propagating distally, if it is well apposed (1). In our case, it could be speculated that the nature of relatively ectatic vessel and lack of calcification may be associated with the hematoma extending even outside the well apposed stent. Furthermore, the stent area at the segments with hematoma became smaller when compared with that at the index procedure, which could be partially explained mechanistically by the hematoma compressing the stent from the outside. Lastly, one could postulate that the proximal bailout stent might push out hematoma distally, resulting in greater force than usual exerted by a hematoma contributing to not only extending the hematoma beyond the stent but also acute stent recoil.

Acknowledgment

None
References:

Figure 1. CAG and IVUS findings.

A: Emergent CAG (red arrowhead in the magnification indicates the entry point of dissection at the proximal RCA).

B: Proximal bailout stenting with two 4.0 /38-mm ZESs from the mid to proximal RCA. However, despite successful bailout stenting, CAG showed occlusive stenosis distal to the stent implanted at the index procedure, which was previously not present.

C: IVUS findings after proximal bailout stenting (a: proximal to the stent, b: stented segments, c: distal to the stent). Red arrowheads indicate extended hematoma.