Re-stenting technique with a second drug-eluting stent and re-narrowing recurrence as assessed in intravascular ultrasound.

Mechanism of a late pre-dilatation effect

Technika ponownego stentowania z użyciem drugiego stentu uwalniającego lek a nawrót zwężenia w ocenie za pomocą ultrasonografii wewnątrznaczyniowej. Mechanizm odległego efektu pre-dylatacji

Kamil Zieliński1, Łukasz Kalirńczuk2, Adam Trzciński1, Michał Proczka1, Marcin Demkow2

1Medical University of Warsaw, Warsaw, Poland
2Institute of Cardiology, Warsaw, Poland

Intravascular ultrasound (IVUS) scans frequently identify the presence of a stent under-expansion among late drug-eluting stent (DES) failures. We present two patients referred for a control angiography due to relapse of symptoms, both with a history of proximal left anterior descending (LAD) artery stenting with a DES. The first patient, 64-year-old female, six-months earlier had a second DES implanted on top of the initial one that had a focal restenosis located on both edges (re-stenting with DES of 2.75 × 32 mm). The procedure was done using a direct stenting technique (without pre-dilatation).

Figure — Panel 1 and 2 — present the angiographic appearance of a focal model of in-DES re-narrowing, recognised at the proximal edge of the overlapping stents (Panel 1–1a and 2–2a, white arrows). Relevant vessel cross-sections recorded with IVUS are displayed on Panel a–b. Inner DES under-expansion, with its minimal cross-sectional area (CSA) of < 3.0 mm² (black arrows indicate single stent’s struts), is seen. Remarkably, also the originally implanted DES (white arrows) appeared to be inadequately expanded (minimal CSA < 5.0 mm²). The second patient, a 67-year-old man, was diagnosed for the first time with in-DES (3.5 × 18 mm) restenosis, presenting a typical focal model (Panel 3, white arrows).

Re-stenting with a second DES was performed, with a high-pressure pre-dilatation (2 × 20 atm.) with a non-compliant balloon (ø = 3.5 mm; being ≥ ø of the original DES, Panel 3a). IVUS revealed that the pre-dilatation re-expanded the original DES, thus creating enough space for a second DES (Panel 3c). Note that the relative expansion of the originally implanted DES (stent CSA/lumen CSA in distal reference × 100%; white arrows) was < 80%. The upper row of Panel c displays the stent’s struts recorded prior to, and the middle row alter, pre-dilatation (distal and proximal references are located far right and left, respectively). Finally, re-stenting using a second DES (3.5 × 22 mm/18 atm.) was performed successfully with IVUS documenting adequate DES expansion with its minimal CSA > 5.0 mm² (black arrows). Even a small amount of intimal hyperplasia located at the under-expanded stent’s regions leads to significant lumen compromise. Proper re-stenting technique aimed at an adequate expansion of stents could lower the 30% rate of a recurrent re-narrowing after DES restenosis treatment with a second DES. Aggressive balloon pre-dilatation using an appropriately sized NC balloon could be a valid option applied prior to a re-stenting treatment.

Address for correspondence:
Kamil Zieliński, Department of Coronary and Structural Heart Diseases, The Cardinal Stefan Wyszyński Institute of Cardiology, ul. Alpejska 42, 04–628 Warszawa, Poland, email: kamilziel@gmail.com

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