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IMAGES IN CARDIOLOGY

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Late adaptive coronary artery remodelling after implantation of a biodegradable stent

Stenting with biodegradable stents is a new interventional approach aimed at adaptive coronary remodelling by limiting acute elastic recoil and late neointimal proliferation. Here, we report on a 53-year-old patient presenting with stable angina and treated with a biodegradable magnesium-alloy stent (Magic, Biotronic Bulach, Switzerland) in the left coronary circumflex artery (LCx). Magnesium alloy offers the benefit of mechanical properties comparable with conventional stents combined with controlled absorption over time. In our patient, two magnesium-alloy stents were implanted in the proximal to mid-part of the LCx. The procedure was complicated

by acute dissection distal from both stents, which was treated medically.

At 4 months' follow-up, LCx was patent, minimal luminal diameter in the stented segment was 1.35 mm (panel A, top). At intravascular ultrasound, residues of magnesium alloys were noted. Note, a minimal cross-sectional area was 3.4 mm², a value below the ischaemic threshold (panel B, top row). Consistent with the segment morphology, functional intracoronary evaluation showed significantly reduced fractional flow reserve of 0.68 (panel A, top).

At 8 months' follow-up, neither residues of the magnesium alloy nor neointimal proliferation were noted. A positive

coronary remodelling was shown from an increase in the minimal cross-sectional area and minimal luminal diameter at both angiography (panel A, bottom) and intravascular ultrasound (panel B, bottom row). In addition, this was paralleled by a significant increase of fractional reserve up to 0.85, a value above the ischaemic threshold. These observations demonstrate late adaptive remodelling of the atherosclerotic coronary artery following the resolution of a biodegradable stent.

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(A) Coronary angiograms after percutaneous coronary intervention with a biodegradable stent. An angiogram at 4 months' follow-up was taken in a right anterior oblique (RAO) view 31°, caudal 30° (left panel) and at 8 months follow-up in an RAO 29°, caudal 24° (right panel). Inserts in each panel indicate the fractional flow reserve, a lesion specific index for the coronary stenosis severity. Fractional flow reserve is given by the ratio of the mean aortic pressure (Pa) to distal coronary pressure (Pd) measured during maximal hyperaemia. RD, reference vessel diameter; MLD, minimal luminal diameter. (B) Intravascular ultrasound at 4 months (upper panels) and 8 months (lower panels) after implantation of a biodegradable stent. In both cases the left panels show the proximal part of the stent, the middle panels show an image of the most narrowed segment and the right panels display the distal part of the stented segment. Arrows at 2, 5 and 7 o'clock in the left upper panel indicate high dense echo suggestive of residues of the magnesium alloy at 4 months' follow-up. EEM, external elastic membrane; CSA, cross-sectional area.