CASE REPORT

IKAZUCHI ZERO™
Semi-Compliant PTCA Balloon

RAIDEN3™
Non-Compliant PTCA Balloon

Schiller's curls in Mozart's CathLab - A case for Kaneka IKAZUCHI ZERO™ and RAIDEN3™ PTCA Balloons

Mathias C. Brandt, Paracelsus Medical University Salzburg,
Clinic II of Internal Medicine

Case outline

Patient: 85 year old female

Clinical presentation: Acute NSTEMI

Clinical history: The elderly patient presented with an acute NSTEMI without any prior coronary angiography. She arrived in the cathlab in a stable condition, no inotropics.

Risk factors: Obesity, arterial hypertension, hyperlipidemia.

CAG findings: Diagnostic angiography showed a coronary 2-VD with involvement of 2 bifurcations: The LAD presented with a lengthy stenosis in the medial segment involving the LAD/RD1 bifurcation **(Fig. 1A)**. The ostium of the RD1 appeared to be only mildly sclerotic **(Fig. 1B)**. The LCX was heavily calcified and angulated with a large, winding RM1 originating within the most severe part of the lesion **(Fig. 2)**. The peripheral segments had an angulated, corkscrew-like morphology.

Treatment approach

Access site: Left radial artery, Boston Scientific Mach CLS 3.5

Lesion: 1) Bifurcation LAD/RD1 2) Bifurcation LCX/RM1.

Strategy: The diagnostic angio showed quite extensive coronary artery disease involving LAD and LCX. Considering the age of the patient, we wanted to limit the procedure to the absolute necessary without implanting an excessive number of stents. On the other hand, TTE had shown wall motion abnormalities anterior and laterally, so both lesions obviously needed treatment.

LAD/RD1: Considering the modest condition of the RD1 ostium with only mild sclerosis **(Fig. 1A)**, we chose a provisional approach with a single stent in the LAD and only minimal sidebranch treatment. With regards to the large size of the RD1 we planned strut opening from LAD to RD1 and kissing-balloon inflation (KBI) only if necessary.

LCX/RM1: From the mid to the distal segment the LCX needed repair **(Fig. 2)**. On close inspection, we saw that the LCX extended straight forward into the RM1, the distal part of the LCX diverted from the bifurcation with a small offset (**see insert Fig. 2**). Therefore, our plan was to preserve this special anatomy and use a 2-stent approach instead of just stenting along the RM1 with a single stent.

Fig 1

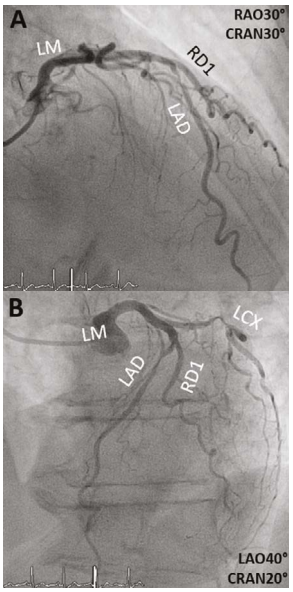

Figure 1: Diagnostic angiography of the LAD: (A) RAO30°CRAN30° projection showing a long LAD stenosis in the mid segment. (B) The LAO40°CRAN20° view offers a better discrimination between LAD and RD1 showing only mild sclerosis of the RD1 ostium. In the left upper part the severe stenosis of the mid LCX segment and marginal branches is visible.

Fig 2

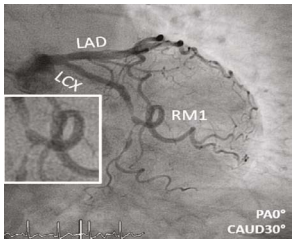

Figure 2: Diagnostic angio of the LCX (PA0°CAUD30°): Severe sclerosis of the mid LCX and distal LCX, where the major part of the LCX extends into the RM1. The distal LCX originates from the bifurcation with a short offset (see insert).

Manufactured by
KANEKA MEDICAL PRODUCTS

Distributed by
Cordis™

Treatment progress

LAD/RD1: From a left radial access we placed a Boston Scientific Mach CLS 3.5 guide and passed 2 Sion wires from LM to distal LAD and RD1. Then the mid segment of the LAD was pre-dilated with 3 steps using a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 15 mm at 14 ATM **(Fig. 3A to C)**. While the LAD showed a short dissection at the site of the most severe stenosis, the RD1 remained without significant plaque-shift **(Fig. 3D)**. Subsequently we implanted a Biotronik Orsiro Mission 2.5 x 35 mm at 12 ATM.

Fig 3A, B, C, D

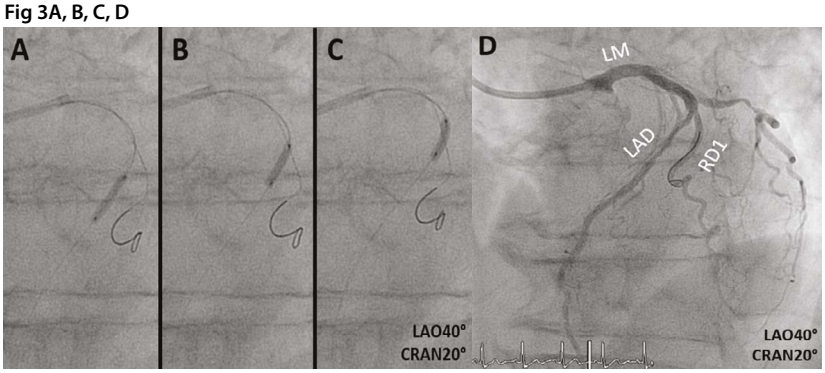

Figure 3: LAO40°CAUD20° view of the LAD/RD1 bifurcation. Sequential predilatation with a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 15 mm NC balloon, with inflations at 14 ATM distal (A), across (B) and proximal (C) to the bifurcation. The post predilatation result shows a short dissection in the mid LAD with minor effects on the RD1 ostium (D).

After that, the RD1 ostium was significantly narrowed, unchanged after intracoronary (i.c.) Nitro application. We performed a POT maneuver with a Kaneka RAIDEN3™ NC PTCA Balloon 3.5 x 8 mm to adapt the stent to the conical shape of the mid LAD segment **(Fig. 4A and 4B)**. As the ostial RD1 problem persisted **(Fig. 4C),** we opened the stent struts with a Kaneka IKAZUCHI ZERO™ Semi-Compliant PTCA Balloon 1.5 x 10 mm, inflation to 14 ATM.

Fig 4

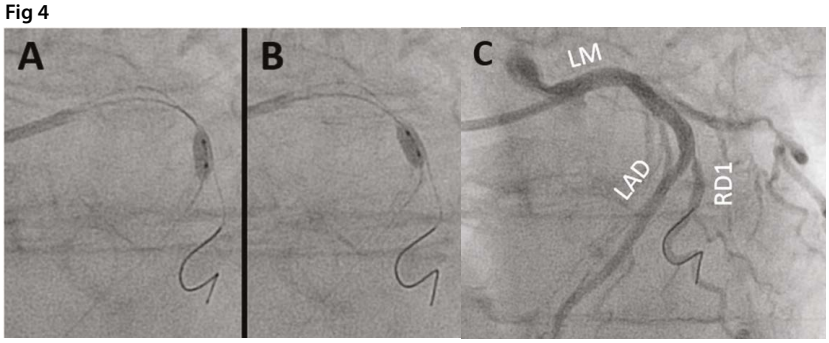

Figure 4: LAD post DES implant: (A) Serial POT inflations with a Kaneka RAIDEN3™ NC PTCA Balloon 3.5 x 8 mm at 12 ATM. (B) The RD1-ostium was still significantly narrowed despite Nitro- application i.C.

After that we performed a kissing-balloon inflation with a Kaneka RAIDEN3™ NC PTCA Balloon 3.25 x 18 mm in the LAD and a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 15 mm in the RD1, inflation 12 ATM in the RD1 and 10 ATM in the LAD **(Fig. 5A)**. After another POT inflation with the previous Kaneka RAIDEN3™ NC PTCA Balloon 3.5 x 8 mm in the prox. LAD **(Fig. 5B)** the result showed a very nice result at the bifurcation with a single stent **(Fig. 5C and 5D)**.

Fig 5

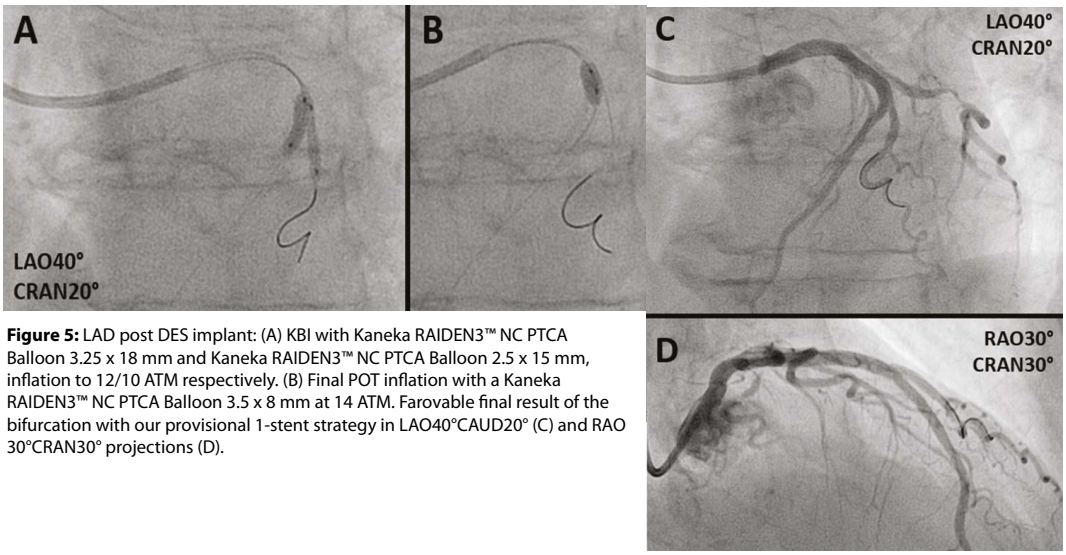

Figure 5: LAD post DES implant: (A) KBI with Kaneka RAIDEN3™ NC PTCA Balloon 3.25 x 18 mm and Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 15 mm, inflation to 12/10 ATM respectively. (B) Final POT inflation with a Kaneka RAIDEN3™ NC PTCA Balloon 3.5 x 8 mm at 14 ATM. Farovable final result of the bifurcation with our provisional 1-stent strategy in LAO40°CAUD20° (C) and RAO 30°CRAN30° projections (D).

LCX/RM1: We switched the 2 Asahi Sion wires into the distal RM1 and LCX, followed by serial predilatations of the LCX and the LCX/RM1 bifurcation **(Fig. 6A to C)** with a Kaneka RAIDEN3™ NC PTCA Balloon 2.25 x 13 mm NC balloon, 14 ATM. The interim result showed a significant lumen gain with a localized dissection in the mid LCX **(Fig. 6D)**.

Fig 6

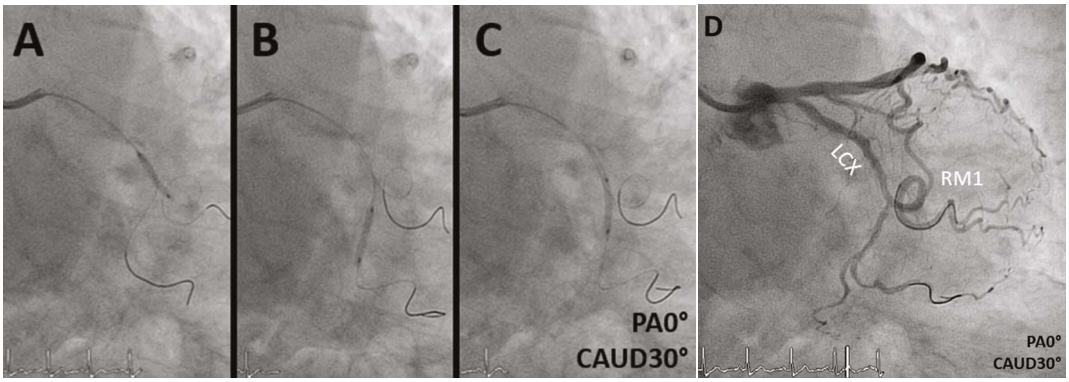

Figure 6: Three predilatation steps (A) to (C) with a Kaneka RAIDEN3™ NC PTCA Balloon 2.25 x 13 mm, 14 ATM. (D) Lumen gain after predilatation with a localized dissection in the med. LCX and bifurcation.

As planned, we proceeded with DES implantation from mid to distal LCX (Biotronik Orsiro Mission 2.25 x 15 mm, 14 ATM; **(Fig. 7A)** with subsequent Mini-Crush maneuver of the ostial struts with a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 10 mm, inflation to 14 ATM **(Fig. 7B)**. We achieved a satisfactory diameter in the LCX segment distal of the bifurcation **(Fig. 7C)**.

Fig 7

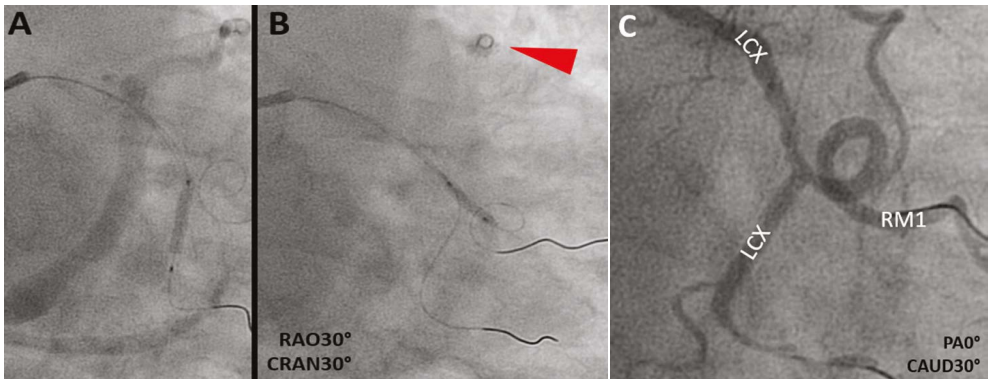

Figure 7: (A) DES implantation (Biotronik Orsiro Mission 2.25 x 15 mm, 14 ATM) from the bifurcation into the distal LCX, followed by Mini-Crush maneuver with a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 10 mm, inflation to 14 ATM (B). The red arrow shows the sagittal view of the previously implanted LAD stent. (C) Interim result with repair of the mid to distal LCX, PA0°CAUD30° angulation.

Fig 8

After that we placed the 2nd DES from the prox. LCX into the prox. RM1 **(Fig. 8A)**, almost orthogonal to the previous stent (Biotronik Orsiro Mission 2.75 x 22 mm, inflation to 12 ATM **(Fig. 8B)**.

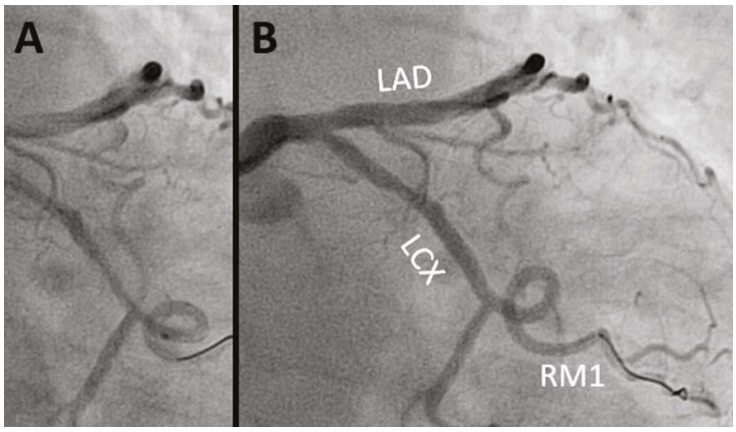

Figure 8: 2nd DES from prox. LCX to prox. RM1 (Biotronik Orsiro Mission 2.75 x 22 mm) across the ostium of the distal LCX stent. (A) Stent placement. (B) Result post deflation in PA0°CAUD30°.

Subsequently, the struts were opened to distal LCX with a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 10 mm, 14 ATM **(Fig. 9A)**, and a POT maneuver performed with a Kaneka RAIDEN3™ NC PTCA Balloon 2.75 x 15 mm, 14 ATM **(Fig. 9B)**. The final angio **(Fig. 9C)** showed a satisfactory result with significant diameter gain of all vessel segments distal of the bifurcation while preserving the original anatomy of the bifurcation with a dominant RM1.

Fig 9

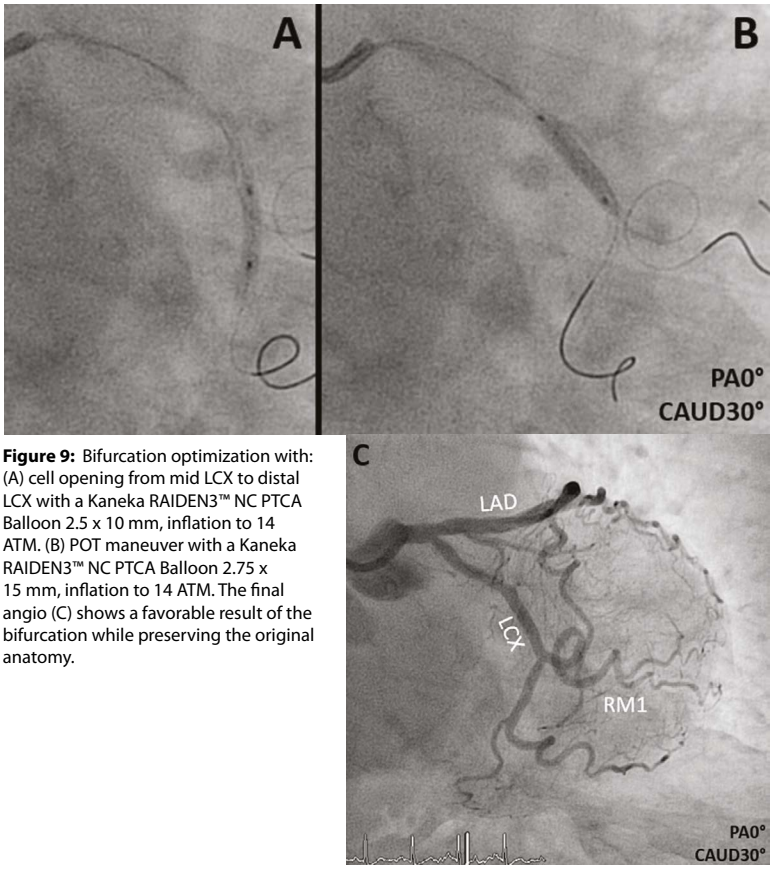

Figure 9: Bifurcation optimization with: (A) cell opening from mid LCX to distal LCX with a Kaneka RAIDEN3™ NC PTCA Balloon 2.5 x 10 mm, inflation to 14 ATM. (B) POT maneuver with a Kaneka RAIDEN3™ NC PTCA Balloon 2.75 x 15 mm, inflation to 14 ATM. The final angio (C) shows a favorable result of the bifurcation while preserving the original anatomy.

Key points on the treatment strategy

Especially in elderly patients, bifurcation treatment should be limited to solutions as simple as possible with as little stent material as possible. The current example illustrates different strategies in 2 bifurcations in a single procedure. In the LAD, provisional treatment can be sufficient with 1 stent, even if it involves KBI and POT. In the LCX we show that bifurcation treatment does not always have to involve KBI and POT-side-POT can be sufficient. In both lesions, Kaneka RAIDEN3™ NC PTCA Balloons provided reliable performance for multi-step bifurcation interventions.

Reference: Burzotta F. et al., Stankovic G. European Bifurcation Club white paper on stenting techniques for patients with bifurcated coronary artery lesions. Cath Cardiovasc Interv 2020; 96(5): 1067-1079.

Manufactured by
KANEKA MEDICAL PRODUCTS

CE 0123
Distributed by
Cordis™