

C054

End balloon wiring technique for contemporary reverse cart

The patient is a 54 year old ex-smoker with a past history of depression and prostatic hypertrophy, who presented in June 2015 with a non ST elevation myocardial infarction. His peak troponin I was 0.394 ng/ml and his peak Creatinine Kinase was 257 U/L. His electrocardiograph shows isolated t wave inversion in lead III and his echocardiogram shows mild anterior wall hypokinesis. He underwent coronary angiography which demonstrated a right coronary artery (RCA) Chronic total occlusion (CTO) and a 90% stenotic lesion in the proximal to mid Left anterior descending (LAD) artery (LAD) which was deemed to be the culprit lesion. A Ultimaster drug eluting stent (Terumo, Japan) was placed to the proximal to mid LAD lesion with excellent angiographic results.

On follow up, the patient continued to have angina and a MRI study showed inducible ischemia in the RCA territory without any infarction. An echo showed normal left ventricular systolic function. He underwent an attempted CTO PCI to his RCA in July of 2016, using Bilateral femoral access was attained and 7 French AL 1.0 guiding (Cordis) and 7 French EBU 4.0 (Medtronic) guiding catheters. However, despite successfully crossing the retrograde septal channel, reverse CART was unsuccessful despite using 2.5 mm antegrade balloon with XTA, Gaia second (Asahi Intecc, Japan), and Wizard 6 g (Japan Lifeline, Japan) as retrograde wires. Finally, a Gaia third (Asahi) succeeded in crossing in reverse CART manner and wired into the antegrade guiding catheter. However, the patient could no longer tolerate the long procedure and the procedure was abandoned at 2 hours 55 minutes procedure time.

A second attempt for retrograde CTO PCI to RCA was undertaken in September 2016. Angiography showed persisting RCA CTO (fig) with a dominant atrial channel retrograde that supplies the retrograde flow to the PDA PLV bifurcation (fig). Right radial and right femoral access was attained and 7 French AL 1.0 guiding (Cordis) and 7 French EBU 4.0 (Medtronic) guiding catheters were engaged. A Fielder XT wire (Asahi) on a corsair (Asahi) microcatheter was used to perform antegrade preparation. A Sion wire (Asahi) supported by a corsair catheter crossed the proximal septal channel (Fig 2a). A wizard 3 g wire (Japan Lifeline) was used as retrograde wire just to the distal tip of the antegrade wire. A 1.5 mm Sapphire II pro balloon (Obriech Neich, Hong Kong) was used as antegrade balloon for contemporary reverse CART. The concept of End Balloon Wiring (EBW) was used in this case where the retrograde wire was directed towards the balloon tip (fig) rather than to attempt to enter from the side of the balloon. Also, minimal wire manipulation was used to reduce the wire space expansion and allow better retrograde wire control. After x attempts the EBW was successful and the wizard 3 wire successfully entered the antegrade balloon space. The time used for reverse CART was about 100 minutes compared to 150 minutes in the first attempt. Intravascular ultrasound (IVUS) was used to confirm true lumen position of the retrograde wire and then the wire was passed to the antegrade guiding and the corsair followed (fig). RG3 wire (Asahi) externalisation was performed and a 2.0 mm Euphora balloon (Medtronic) was used to dilate the RCA. IVUS was used to determine stent size and overlapping Osiro drug eluting stents (Biotronik) 2.5 x 40, 3.5x 18, and

3.0 x 40 mm were placed. After postdilatation with 3.5 mm balloon, PLV and PDA ostium were optimised with 1.5 mm balloon angioplasty. Final angiography shows excellent results with mild residual stenosis in PDA ostium.

6 month follow angiogram showed excellent result

Discussion: Why End Balloon wiring technique?

After balloon deflation, the wire tip moves forward and would enter the space created by the balloon because wires are moving forward devices.

Wire tip generates maximum penetrating force and torque force in front. Therefore, If we puncture towards the end of balloon, wire will go in parallel direction of the balloon

On the other hand, if the retrograde wire enter the side of the balloon, the penetrating and torque forces would be diminished. The wire tip goes in perpendicular direction of the balloon.

This requires more manipulation and may create more subintimal tracking.

Therefore, End balloon wiring technique is able to allow less subintimal tracking. This may further shorten the time for contemporary reverse cart technique and may improve long term further result.