

Received: 2016.11.27
Accepted: 2017.01.25
Published: 2017.04.30

ISSN 1941-5923
© Am J Case Rep, 2017; 18: 472-477
DOI: 10.12659/AJCR.902560

Telescopic Corsair in 5F Guidion for Retrograde Recanalization of Complex Chronic Total Occlusions (CTOs)

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

AE 1,2 **Pieter-Jan Palmers**
A 1,3 **Joren Maeremans**
B 4 **Markus Meyer-Gessner**
B 5 **Yoann Bataille**
ABE 1 **Joseph Dens**

1 Department of Cardiology, Hospital East Limburg, Genk, Belgium
2 Department of Cardiology and Intensive Care, Centre Hospitalier Chrétien, Site St Joseph, Liège, Belgium
3 Faculty of Medicine and Life Sciences, University of Hasselt, Hasselt, Belgium
4 Department of Cardiology and Intensive Care, Augusta Hospital, Düsseldorf, Germany
5 Department of Interventional Cardiology, Center Hospital Regional of The Citadel, Liège, Belgium

Corresponding Author: Pieter-Jan Palmers, e-mail: pieterjanpalmers@hotmail.com
Conflict of interest: None declared

Case series

Patient: Male, 81 • Female, 72 • Male, 58
Final Diagnosis: CTO
Symptoms: Angina pectoris
Medication: —
Clinical Procedure: PCI
Specialty: Cardiology

Objective: Unusual setting of medical care

Background: Retrograde advancement of microcatheters through septal/epicardial connectors can be challenging. Although several tricks might help to do so (e.g., balloon trap of retro wire in second guiding, balloon trap of retro wire in native coronary artery, and use of antegrade extension to approximate the antegrade conduit to the retrograde gear), these tricks cannot always be applied, especially in patients with poor access. Also, puncturing, knuckling, and crossing of the distal CTO cap (or the aorta as described in 1 of the cases) sometimes needs a lot of backup of the microcatheter.

Case Report: We describe 3 cases in which we used a novel telescopic technique with 5F Guidion (IMDS®) supported retrograde Corsair (Asahi®) advancement in complex CTO lesions.

Conclusions: The telescopic Corsair in 5F Guidion may offer the support needed to end successfully in these situations.

MeSH Keywords: Coronary Artery Disease • Coronary Occlusion • Percutaneous Coronary Intervention

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/902560>



1301



1



12



4



Background

Retrograde crossing of the chronic total occlusion (CTO) with a microcatheter is one of the key steps in retrograde recanalization of CTOs. Sometimes, advancing microcatheters through septal/epicardial connectors or crossing the distal CTO cap proves very challenging. Strong microcatheter support is needed to end successfully in these situations. We describe 3 cases of 5F Guidion (IMDS®) supported retrograde Corsair (Asahi®) advancement in complex CTO lesions.

Case Report

Case 1

An 81-year-old male patient presented with worsening heart failure due to anteroseptal ischemia. The diagnostic angiogram showed an occlusion of the heavily calcified mid-LAD just behind S1 and D1, in addition to a severe stenosis in the distal Cx and mid RAC (Figures 1, 2). The J-CTO score was 3 (blunt stump, severe calcification, >20 mm CTO length) [1]. There was a nice epicardial connection from the marginal branch to the apical LAD (Figure 2). In the first procedure, with retrograde approach, we managed to advance a Corsair microcatheter up to the occlusion, and we were able to cross the lesion with a Gaia III wire (Asahi®) to reach the antegrade guiding. Unfortunately, the retrograde Corsair could not cross the lesion due lack of support. Use of a balloon trap of the Gaia III within the guiding or within the LAD was not possible due to limited access size (6Fr, due to peripheral artery disease). The procedure was stopped and rescheduled. In the second procedure, the 150-cm Corsair was inserted into a 5F Guidion to

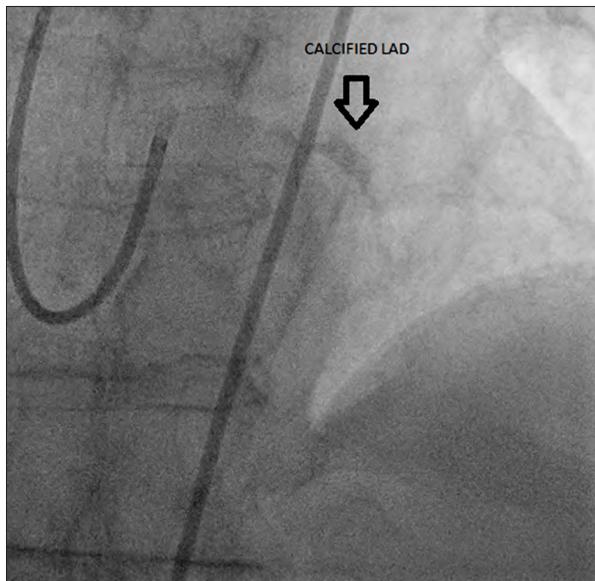


Figure 1. Mid-LAD calcifications.

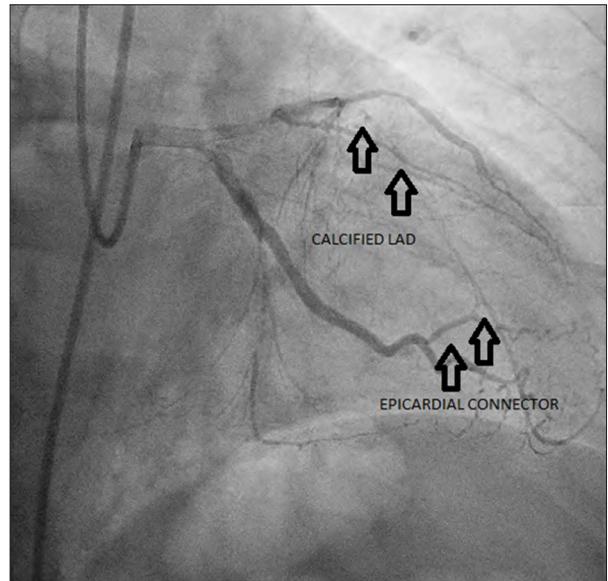


Figure 2. Occlusion of the heavily calcified mid-LAD and epicardial connection from the marginal branch to the apical LAD.

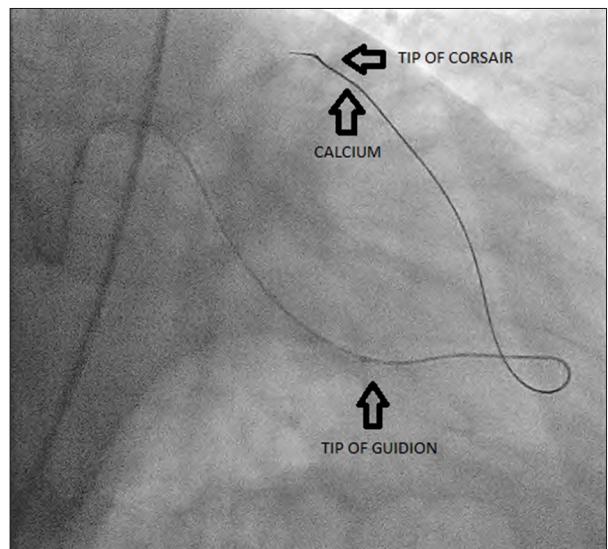


Figure 3. Telescopic technique: The Guidion was placed in the marginal branch up to the take-off of the epicardial connection. The Corsair was further advanced and the occlusion was crossed.

be used as a telescopic device. The Guidion was placed in the marginal branch (together with the Corsair) up to the take-off of the epicardial connection (Figure 3). The Corsair was further advanced and the occlusion was crossed. This time, with the extra support of the Guidion, the Corsair could be spun through the calcified CTO and into the antegrade guiding. An RG3 wire was advanced and externalized. Since we were working with 1 guiding, the Corsair was removed from the RG3 and the RG3 was used for antegrade ballooning and stenting, with

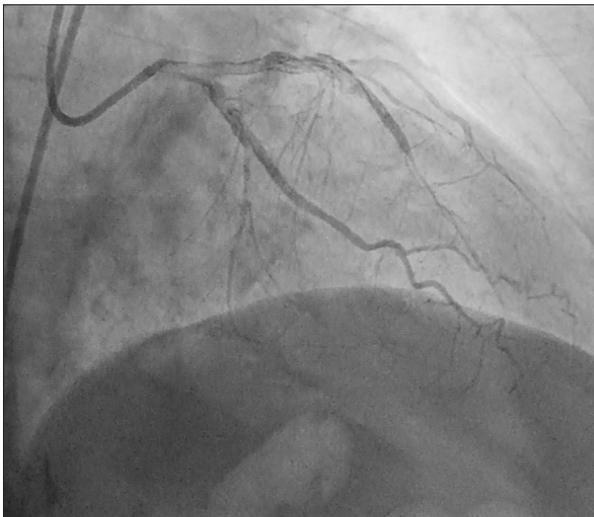


Figure 4. Final angiogram, case 1.

good result (Figure 4). Procedure safety characteristics can be found in Table 1.

Case 2

A female patient, age 72 years, was referred for a second recanalization attempt of an ostial occluded RAC. The diagnostic images showed an ostial occluded RAC. The J-CTO score was 5 (blunt stump, calcified, long CTO, takeoff with a bend, 2nd attempt). There was a good septal connection, which was also used in the first attempt (Figure 5). The first attempt failed because the retrograde wire could not be externalized freely into the aorta (for snaring). Upon the second attempt, a Guidion 5F with 150-cm Corsair was used to engage the septal connection (Figure 6). Once the septal was crossed with a Sion wire, the Corsair was advanced up to the RV branch (distal cap of the occlusion) with a low amount of resistance. After distal cap puncture from the RV branch with a Confianza pro 12 (Asahi®), the Corsair could be advanced close to the calcified ostium of the RAC, over a Fielder XT-A (Asahi®) knuckle. Very stiff wires were used to cross into the aorta: Confianza pro 12, ProVia 15 (Medtronic), and, finally, Stingray needle (Boston Scientific). The Guidion-supported Corsair allowed puncture with these wires. Only after antegrade puncturing (Confianza pro 12), advancement of Corsair over a Fielder XT-A knuckle, ballooning of the ostium and post-ostial segment, the wire could be externalized freely into the aorta. The RG3 wire was

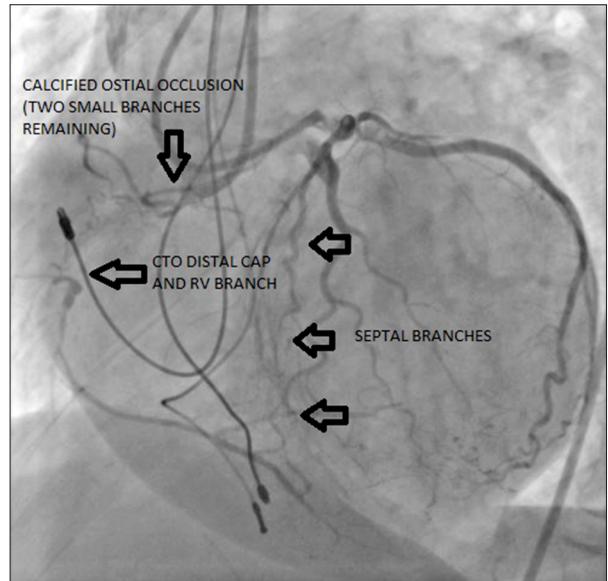


Figure 5. Occluded ostial RAC, with good septal collateral connection. The J-CTO score was 5 (blunt stump, calcified, long CTO, takeoff with a bend, 2nd attempt).

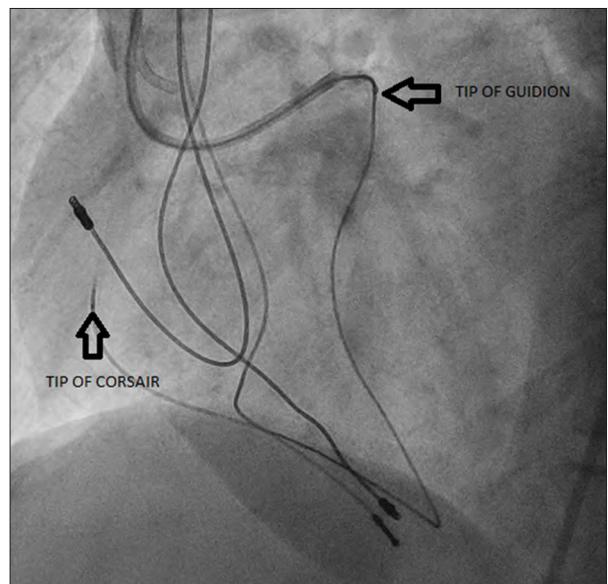


Figure 6. Telescopic technique: The Guidion was used to engage the septal connection. The Corsair was advanced up to the RV branch (distal cap of the occlusion).

Table 1. Procedure safety characteristics.

	Contrast used	Radiation dose	Procedure time	Fluoro time
Case 1	205 ml	1519 mGy	160 min	4080 s
Case2	310 ml	964 mGy	195 min	6024 s
Case3	324 ml	2281 mGy	227 min	4776 s

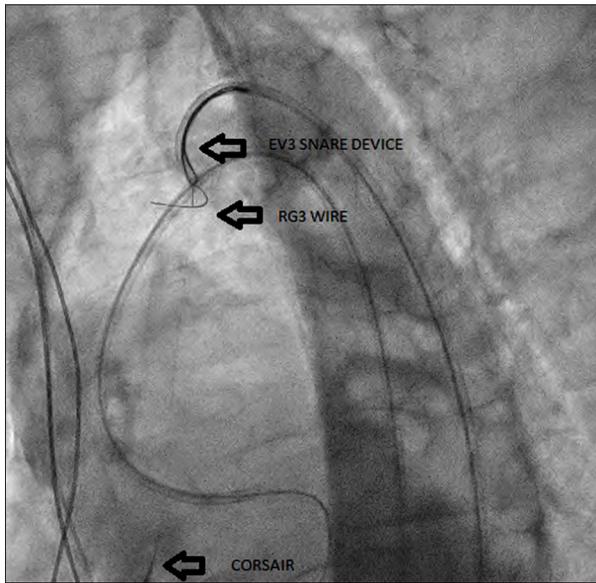


Figure 7. The RG3 wire was snared (EV-3 snare) and externalized.



Figure 8. Final angiogram, case 2.

then snared (EV-3 snare) and externalized (Figure 7). After this maneuver, antegrade ballooning and stenting was possible, with good result (Figure 8). Procedure safety characteristics can be found in Table 1.

Case 3

A male patient, age 58 years, was hospitalized urgently with unstable angina due to a CTO of the LAD just distal to the first diagonal branch (D1). After 2 unsuccessful previous attempts to open the CTO, the patient presented in our center for the 3rd attempt. Bilateral injection through an EBU 8F antegrade and AL1 7F SH retrograde showed the CTO of the LAD (Figure 9). The J-CTO score was 1 (re-do procedure). The length of the occluded segment was estimated at 10 mm. Collateral connections were present. There was a tortuous septal connection

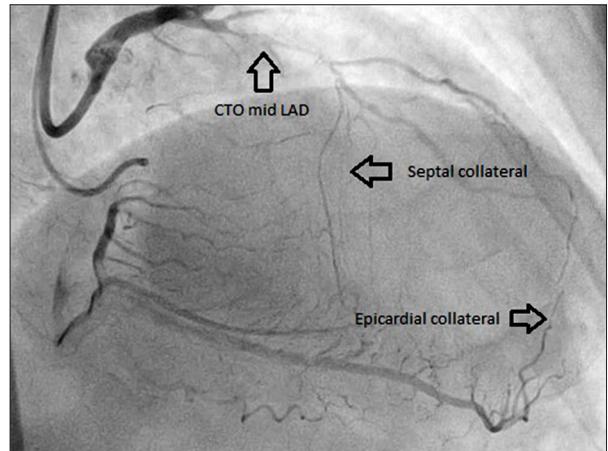


Figure 9. CTO of mid-LAD with septal and apical connectors.

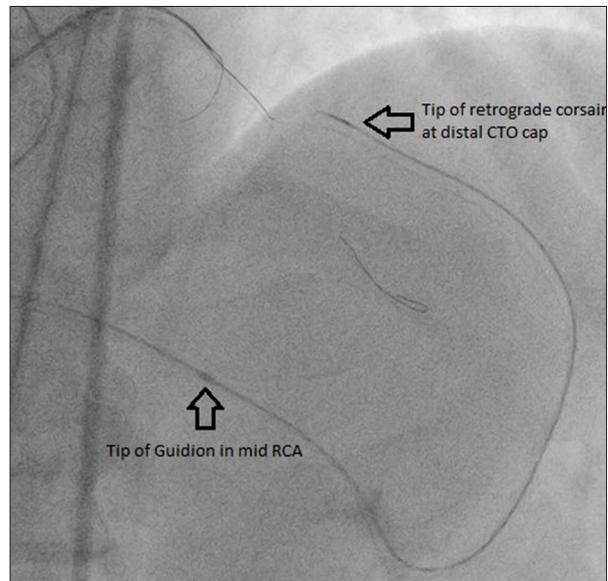


Figure 10. Telescopic technique: Guidion tip positioned in the mid-RCA and Corsair advanced to the distal cap of the occlusion.

(CC1) and a nice apical epicardial connection from the PDA to the D2 (CC1). In the antegrade attempt to cross the occlusion, the Fielder XT in a NHancer ProX was going into the subintimal space. The NHancer ProX was exchanged for the NHancer RX dual-lumen catheter to perform parallel wiring using Gaia First and Gaia Second in escalation. It was impossible to cross the hard proximal cap. The decision was made to move to the retrograde approach via the epicardial collateral, using a Corsair 150 cm and a Sion Blue. The wire crossed the apical section of the collateral smoothly up to the occluded section, but it was impossible to spin the Corsair to the occlusion due to a lack of backup support. The retrograde Corsair was introduced into a 5F Guidion. Using the telescopic technique with the Guidion tip positioned in the mid-RCA, it was possible to advance the Corsair 150 cm in the LAD close to the distal cap



Figure 11. Final angiogram, case 3.

of the occlusion (Figure 10). After several balloon inflations, antegrade unintentional reentry into the LAD true lumen was achieved when preparing for reverse CART using the knuckle technique with Sion Blue, similar to a kissing wire. After successful retrograde crossing of the occlusion and externalization of the RG3 wire, the NHancer RX dual lumen catheter was used in a rendez-vous technique with Corsair to safely secure the D2 branch using a Sion Blue wire. Two stents were successfully placed in the LAD with a patent D2 branch (Figure 11). Procedure safety characteristics can be found in Table 1.

Discussion

Retrograde advancement of a microcatheter through septal/epicardial connectors and also through the CTO lesion itself can be challenging. However, once the retrograde microcatheter has reached the antegrade guiding, wire externalization with a RG3 wire (Asahi®) is easily performed [2,3]. Although the retrograde wire can be trapped with a balloon in the antegrade guiding or in the native coronary artery to provide support for crossing of the CTO with the microcatheter, these techniques are not always applicable; for example, when a 6F antegrade guiding is used, the presence of the microcatheter does not allow trapping of the wire into the guiding with an additional balloon alongside the microcatheter. Also, balloon trapping of the retrograde wire in the native coronary artery is not always possible for anatomical reasons (e.g., ostial LAD occlusion). One of the often-used additional techniques is to maneuver the retrograde wire followed by the microcatheter (and later RG3 wire (Asahi®)) into an antegrade guide extension (guide extension-assisted retrograde wiring and guide

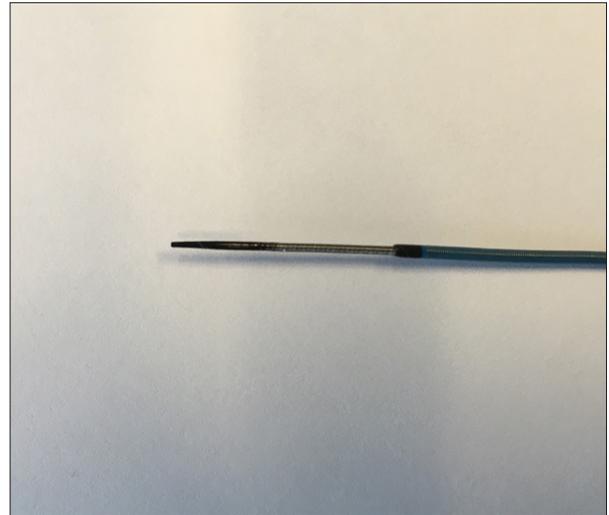


Figure 12. The internal diameter of the Guidion (1.42 mm) allows the Corsair (external diameter: 0.87 mm) to fit in perfectly, with smooth transition.

extension-assisted reverse CART) [4]. In patients with poor access (6F) or single catheter use (ipsicollateral), these techniques might fail. In case 1 and 3 we describe how a novel telescopic Corsair in Guidion technique facilitates passage of a microcatheter through collateral vessels. In case 2, we describe how this telescopic Corsair in Guidion technique offered the necessary support to puncture a very hard ostial CTO. The internal diameter of the Guidion (1.42 mm) allows the Corsair (external diameter: 0.87 mm) to fit in perfectly, with smooth transition (Figure 12)

Conclusions

During retrograde CTO procedures, the telescopic Corsair in 5F Guidion may offer the support needed to end successfully when advancing microcatheters through septal/epicardial connectors or when crossing the distal CTO cap proves challenging.

Acknowledgements

Jo Dens receives grants from Top Medical (Distributor of Asahi Intecc Co. Materials), Boston Scientific and Orbus Neich for teaching courses and proctoring.

Statement

During the scientific work reported on in this paper, all procedures followed were in accordance with the ethics standards of the responsible institutional and national committee on human experimentation.

References:

1. Morino Y, Abe M, Morimoto T et al: Predicting successful guidewire crossing through chronic total occlusion of native coronary lesions within 30 minutes: the J-CTO (Multicenter CTO Registry in Japan) score as a difficulty grading and time assessment tool. *JACC Cardiovasc Interv*, 2011; 4(2): 213–21
2. Brilakis ES, Grantham JA, Rinfret S et al: A percutaneous treatment algorithm for crossing coronary chronic total occlusions. *JACC Cardiovasc Interv*, 2012; 5(4): 367–79
3. Surmely JF, Tsuchikane E, Katoh O et al: New concept for CTO recanalization using controlled antegrade and retrograde subintimal tracking: The CART technique. *J Invasive Cardiol*, 2006; 18(7): 334–38
4. Mozid AM, Davies JR, Spratt JC: The utility of a guideliner™ catheter in retrograde percutaneous coronary intervention of a chronic total occlusion with reverse cart-the “capture” technique. *Catheter Cardiovasc Interv*, 2014; 83(6): 929–32