World Medica news
CARDIO
ESTUDIOS Y NOVEDADES EN TERAPIAS MÍNIMAMENTE INVASIVAS **N36 / 2024**
WORLD-MEDICA.COM

Edición Digital

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A 57-year-old man who is a smoker with a record of hypertension and hypercholesterolemia presents with class III CCS stable angina of several years despite the anti-ischemic medication. The echocardiogram shows normal ejection fraction with slight inferior hypokinesia. No Q waves are present in the EKG. The coronary angiography showed a left dominant circulation with a chronic total occlusion (CTO) in the the ostium of circumflex artery (CX) (fig.1). The proximal cap of the CTO is blunt, and the occlusion is of more than 30mm in length. The distal filling of the distal CX comes from the anterior septals (the connection is very tortuous) and from an epicardial collateral arising from the apical left anterior descending artery (LAD) (Fig.2)

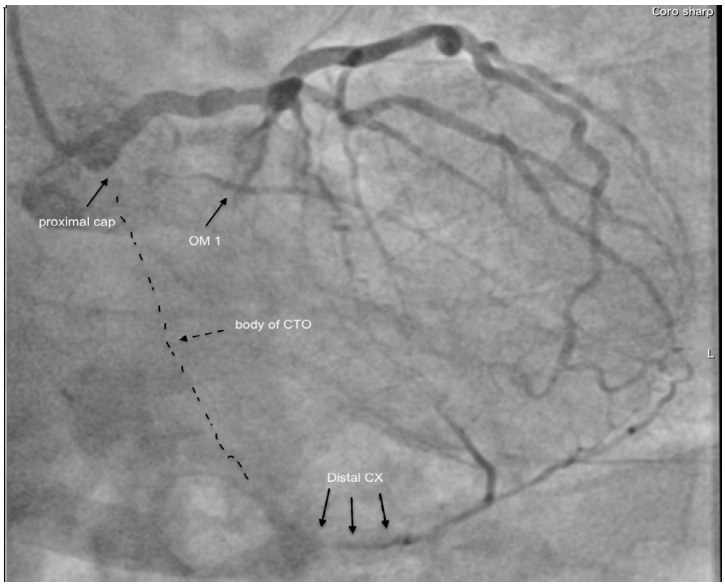

Fig.1: Right caudal view: CX CTO with blunt cap; long occlusion

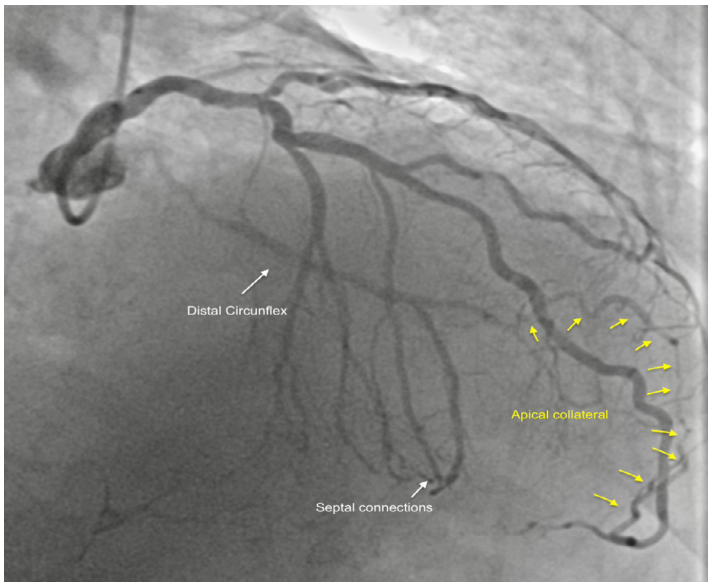

Fig. 2: Right cranial view: septal and apical collaterals

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It was decided to perform CTO PCI of the Circunflex
A XB 3 7F guide catheter was used to obtain an adequate support. A Sion wire was moved to the distal LAD to obtain guide catheter stabilization. A second Sion wire in a Caravel 135 microcatheter was able to penetrate in the proximal cap of the CTO. Then, sequentially, a Fielder XTA and a Gaia 2nd wire advanced both in the subintimal space of the distal CX.

We followed to a retrograde approach with a 150 cm Caravel microcatheter, and several wires were used (Sion, Sion Black and Suoh 03) but it was not possible to negotiate the tortuosity of the septal connections (Fig.3).
The same microcatheter and a Sion Wire were able to advance through the LAD apical collateral and reach the distal cap of the occlusion.
A Fielder XTA crossed retrogradely into the subintimal space. Likewise, a retrograde Gaia 2nd wire did not reach the true lumen. A reverse cart was performed with a 2.5X20 NC antegrade balloon and a Fielder XTA retrograde wire (fig. 4).

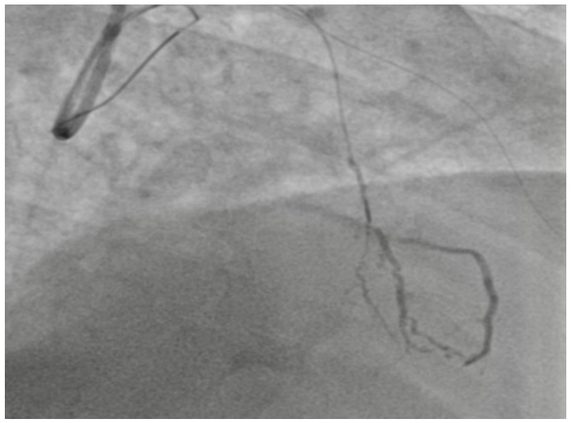


Fig. 3: septal tip injection showing tortuous and no crossable connections

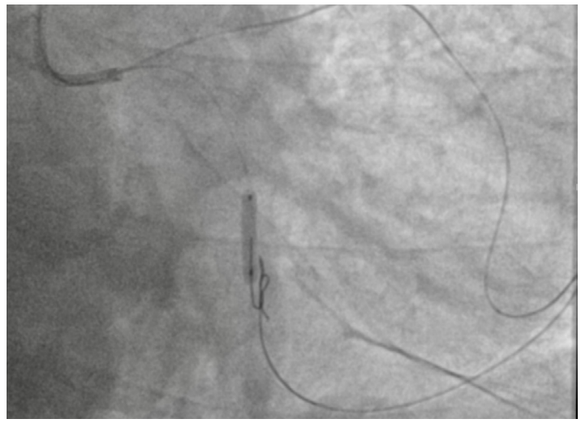


Fig. 4: Reverse Cart technic

The last wire was able to reach the aorta (fig. 5) and then the antegrade catheter. Nevertheless, the retrograde Caravel 150 could not get as far as the antegrade catheter because of its insufficient length.

We returned to the antegrade approach with a Gaia 3rd to attempt a re-entry using the retrograde Caravel 150 in the false lumen as a distal reference. This time, it was possible to enter the antegrade wire into the retrograde microcatheter (Fig. 6 and 7). Neverthless, the antegrade Caravel did not cross a very tight lesion.

We successively tried to advance different small profile balloons without success. Finally, we tried to advance a rotawire but it did not cross distally to the true lumen, having the retrograde mi-crocatheter moved out of place, in order to try a tip to tip re-entry as before. Due to the duration of procedure (3 hours; Air-Karma 2.0Gy) we decided to interrupt the procedure and a second attempt was made 3 months later.

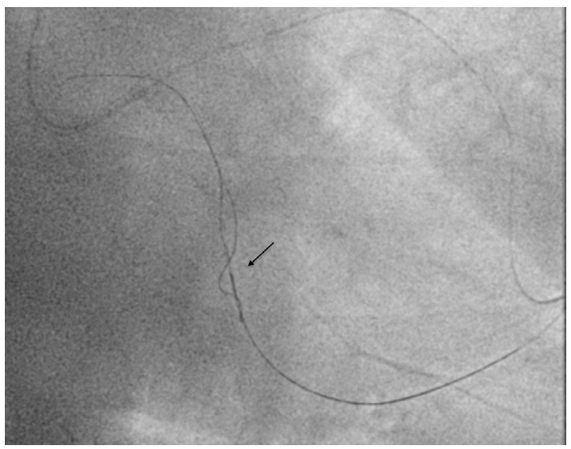


Fig. 5: retrograde wire – Fielder XTA in aorta, but 150 cm microcatheter unable to reach antegrade catheter (arrow)

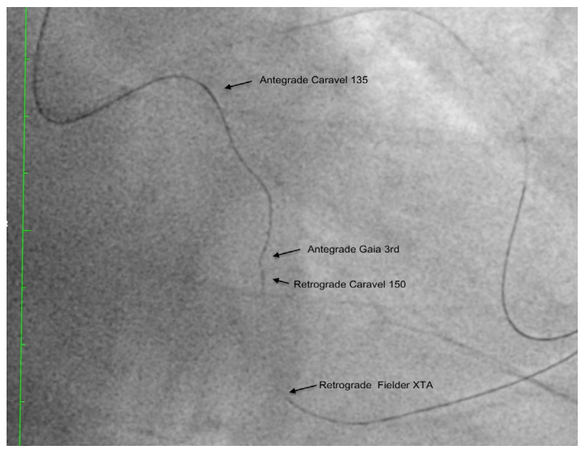


Fig. 6: Antegrade Gaia 3rd close to the tip of retrograde Caravel 150 cm

During the second attempt, a 7F guide-catheter was shortened by 10 cm using a 6F femoral sheath. An antegrade Gaia 2nd wire and a Caravel 135 were advanced to the subintimal space. A retrograde Sion wire in a 150 cm Caravel was able to cross the apical LAD collateral and reach the distal cap. A Fielder XTA was then used to retrogradely get across the distal cap to the subintimal space, allowing to position both of the Caravel microcatheter tips close to each other. Then, a Sion retrograde wire was able to enter into the antegrade microcatheter and reach the guide catheter. This wire was trapped in the guide catheter and the retrograde microcatheter was able to easily reach it, making possible the externalization with a RG3 wire.

The angioplasty was then guided and optimized using digital IVUS. Furthermore, four drug eluting stents were implanted with a final TIMI III flow. The fluoroscopy time was 58 min, the Air-Karma radiation was 2.3 Gy and 180 ml of contrast was used. No complications occurred and the patient was discharged the following day.

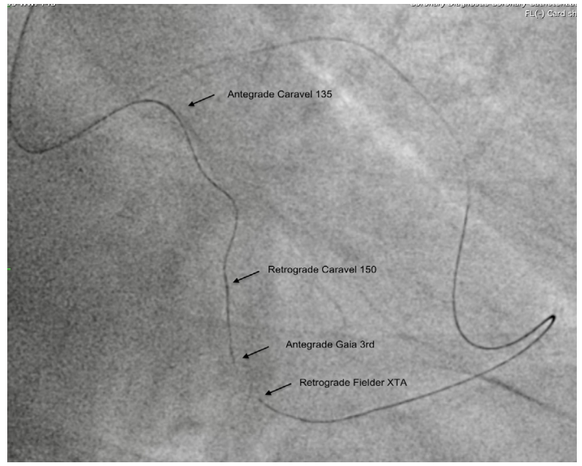


Fig. 7: Antegrade Gaia 3rd already inside the retrograde Caravel 150 cm

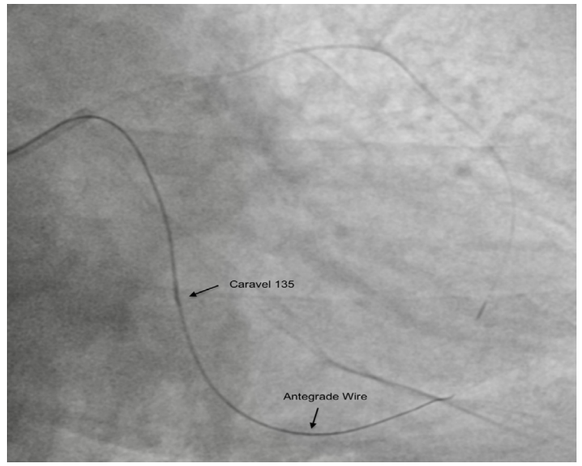
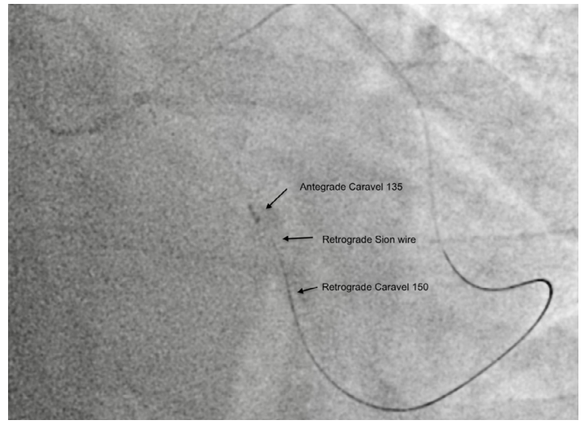


Fig. 8: Impossibility of crossing the lesion with the microcatheter



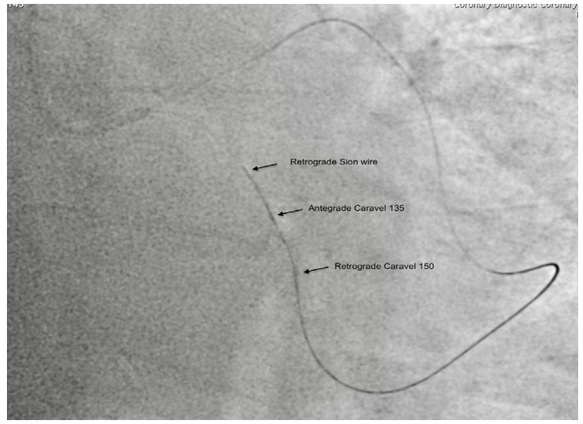


Fig. 9 and 10: progression of Sion wire from the retrograde to the antegrade microcatheter

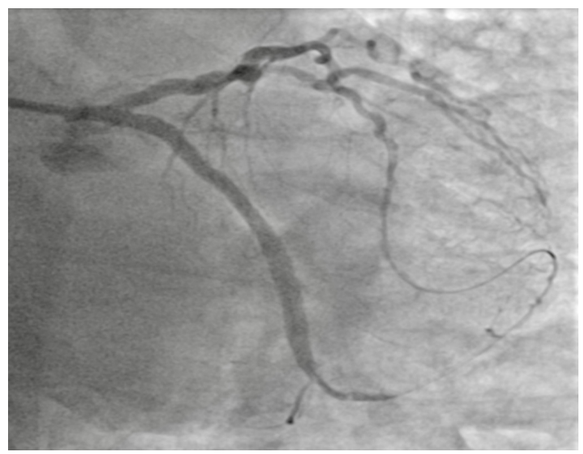


Fig. 11: Final angiography