A twist, A turn and A Tear

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A 63 year old gentleman with background history of smoking and hyperlipidemia was referred for recurrent angina. Coronary angiogram at another hospital showed 2 vessel disease - severe proximal LAD disease with CTO of proximal RCA.

PCI to LAD was performed without any complications and he was referred to us for PCI of the CTO RCA. Unfortunately no cine images of the CTO RCA were available for review.

Physical examination was uneventful with BP 135/87, HR 80 bpm regular, clear lungs with no murmurs.

ECHO showed good LVEF 62%, normal LV size with septal LVH 1.3cm; TAPSE 2.0cm. Normal valves.

Coronary angiogram findings:

Left main: normal

Left Circumflex artery: normal, non dominant

Left Anterior Descending Artery: proximal LAD stent patent; epicardial retrograde filling to distal RCA

Right Coronary Artery: 2 tandem CTOs at proximal and mid RCA, JCTO score 2 (calcification, lesion length >20mm). Presence of bridging collaterals from atrial branch of RCA to mid RCA

We proceeded with PCI to CTO RCA.

Attempt to approach proximal cap with FIELDER XT in CARAVEL microcatheter using SAL 0.75 guide was unsuccessful due to poor guide position. Changed to JR 3.5 guide, crossed first CTO up to mid RCA with FIELDER XT followed by GAIA II, however loss system due to poor guide support.

Changed guide to AL 0.75, successfully crossed both CTOS into PL branch, confirmed via retrograde injection. Changed to workhorse wire but failed to deliver semi compliant 1.0 or 0.75 balloon past mid RCA. TURNPIKE SPIRAL microcatheter used to create track to distal RCA, however despite support wire in RV branch still unable to deliver balloon past mid RCA.

Proceeded to use TURNPIKE SPIRAL to create track in RCA again, followed by exchanging wire with GRANDSLAM to PL. Finally able to deliver 0.75 balloon to distal RCA and sequential predilatation with semi compliant 0.75, 1.0, 2.0 and scoring NC 2.5 balloons performed. Proximal RCA prepared with NC 3.0 balloon. PD flow was compromised, wired with SION BLUE and predilated with scoring balloon.

IVUS showed diffuse fibrocalcific plaque from PL to proximal RCA, with large intramural hematomas and multiple dissections at distal RCA into PL. Distal flow reduced to TIMI I due to expanding intramural hematoma and dissections. Stented PL to ostium RCA with DES 2.5x36mm, 3.0x36mm and 3.5x48mm, followed by postdilatation with NC3.0 and 4.0 balloons at high pressure. Final IVUS shows good results with TIMI III flow in final shots.

This case illustrates the importance of guide support while performing antegrade wire escalation for CTO PCI. In balloon uncrossable lesions where atherectomy is not an option in view of high likelihood of presence of significant dissections, a microcatheter with high flexibility, trackability and torque transmission is used to create sufficient luminal gain to allow passage of further equipment for successful lesion preparation.

Intimal dissection leading to formation of intramural hematoma can lead to acute vessel occlusion. Immediate stent deployment to seal the dissection flap, preventing further accumulation of hematoma and restoring vessel patency is necessary.