

Baseline coronary angiogram: The target lesion was a CTO lesion in the proximal RCA. The distal RCA well filled through the rich collateral channels of the LAD via the septal perforators. The mid LCX was 70% diffuse stenosis

Procedure: Double 7 Fr sheath were inserted into the both femoral artery, then the right coronary ostium was engaged with a 7 Fr AR II guiding catheter, and the left coronary ostium was engaged with a 7 Fr JL 4.0 guiding catheter and performed the dual injection. Firstly, 0.014-inch Runthrough NS guidewire with a Caravel 0.014 inch 1.9 Fr-135 mm microcatheters was inserted into pRCA. And then the guidewire was changed to conquest and a Gaia second wire, but didn't pass the lesion. After that the left coronary was engaged with a 7Fr EBU catheter, and we tried to use retrograde technique to pass the lesion but failure. Then a guidewire inserted into RCA and reached mRCA. We had a situation of difficulty of GW passing from both sides because of ultra-hard CTO lesion. IVUS showed the wire in the false lumen (Figure 1). Next Fielder XT wire was used to pass the lesion, and went to subintimal, pushed by force in the subintimal space to form Knuckle Wire. With repetition of this maneuver, Knuckle Wire approaches to distal true lumen. Finally, Knuckle Wire changed to penetration guidewire to puncture in dRCA (Figure 2). After that IVUS showed guidewire in the true lumen of dRCA. Three stents were deployed from proximal to distal RCA. Final angio showed the flow of RCA was TIMI 3.

Discussion: Under the supervision of IVUS, Knuckle wire is a very effective last method for passing ultra-hard lesions.