A 80-year-old man visited our emergency room with chest pain for 12 hours. His electrocardiogram showed T wave inversion in lead III. Serum troponin-I and CK-MB were elevated to 2.995 ng/mL and 21.32 ng/mL, respectively. He had a history of hypertension, uncontrolled dyslipidemia, and prostate cancer which of status was no evidence of disease after surgery. Echocardiography showed normal ejection fraction of 64% without regional wall motion abnormality. He was diagnosed with non-ST elevation myocardial infarction (NSTEMI) and referred to cath lab for coronary intervention.

Coronary angiography (CAG), which performed with radial artery approach, showed diffuse subtotal occlusion with severe calcification from proximal right coronary artery (RCA) to middle RCA and chronic total occlusion (CTO) of the mid to distal RCA (Figure 1). CAG showed intermediate lesion of left anterior descending artery (LAD) and LCX with retrograde flow from distal left circumflex artery (LCX) to distal RCA, the Rentrop’s collateral class 3. As an initial strategy, antegrade approach was adopted. A 6Fr Judkin guiding catheter was engaged into RCA. The 1st trial using 0.014” Sion black guidewire (Asahi Intecc, Japan) supported by Corsair microcatheter (Asahi Intecc, Japan) was failed to pass the lesion because of heavy calcification at proximal RCA. In the 2nd trial, Gaia first guidewire (Asahi Intecc, Japan) attempted to enter the lesion, but failed to reenter the true lumen of the distal RCA. During the procedure, balloon catheter and microcatheter was failed to advance through the lesion. The patient was intolerable so that we stopped the procedure.

We tried CTO intervention again, 5 days later. Through both common femoral arteries, 7Fr Extra Back-Up 3.5 guiding catheter was engaged into left coronary artery, and 7Fr Amplatz Left 1 Short Tip Side Holes guiding catheter into right coronary artery. A Sion wire (Asahi Intecc, Japan) with a Corsair microcatheter was used to perform a retrograde approach to the distal RCA via collateral artery of the distal LCX and an antegrade approach to the middle RCA using another Sion wire with corsair microcatheter. Subsequently, the Sion wire of the antegrade approach was replaced by Ultimate bros 3 (Asahi Intecc, Japan) and two guidewires were successfully crossed (Figure 2). Retrograde guidewire was successfully inserted into antegrade Corsair microcatheter, but both of antegrade and retrograde Corsair microcatheter was not advanced to each other at all. We tried to externalize 0.014 guidewire, but failed. Conquest Pro (Asahi Intecc, Japan) attempted to proceed antegrade along the retrograde wire but failed. Ultimate bros 3 succeeded to pass through the lesion, antegrade. Balloon dilation was done with Ikazuchi 1.0 x 6 mm balloon (Kaneka, Japan), but the balloon was not passed through whole lesion. Despite balloon dilation, the microcatheter did not pass the calcified stenotic lesion in proximal RCA. So we decided to perform rota-ablation on the calcified mid-RCA lesion. The ROTAwire guidewire (Boston Scientific, USA) did not cross the CTO lesion and was placed in the right ventricular branch artery just beyond the mid RCA. Rota-ablation with 1.5 mm burr was performed a few times on the calcified lesion, but ROTA burr catheter was stuck in the lesion. After several trials of forceful and gentle traction of ROTA burr, ROTA burr was successfully retrieved. After that, the Sion wire with Corsair microcatheter was antegrade reached to the distal RCA (Figure 3). Balloon was successfully passed through the lesion. Balloon dilation using Ikazuchi zero 2.0 x 15 mm balloon (Kaneka, Japan) was done through the CTO segment at 20 atm.. Finally, Orsiro 2.5 x 30 mm stent for distal RCA (Biotronic, Germany), Orsiro 3.0 x 40 mm stent for middle RCA, and Orsiro 3.5 x 30 mm stent for proximal RCA were successfully placed. Adjuvant dilatation using Raiden 3 3.0 x 15 mm balloon (Kaneka, Japan) at 24 atm was performed, and final angiography showed successful CTO intervention (Figure 4).