

CTO story: When the rock is very hard.....

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Patient data and details

- Reason for hospitalization: 6 months ago, the patient has been diagnosed with exertional and at rest angina: Angio – LAD 80% PCI DES and CTO RCA refused surgery
 - Currently - hospitalized for myocardial revascularisation



Sex - Male

Age – 74 years

Occupation - retired

Good living conditions; urban environment

Height – 158 cm

Weight – 70 kg

No significant heredo-collateral data

Overall condition - stable

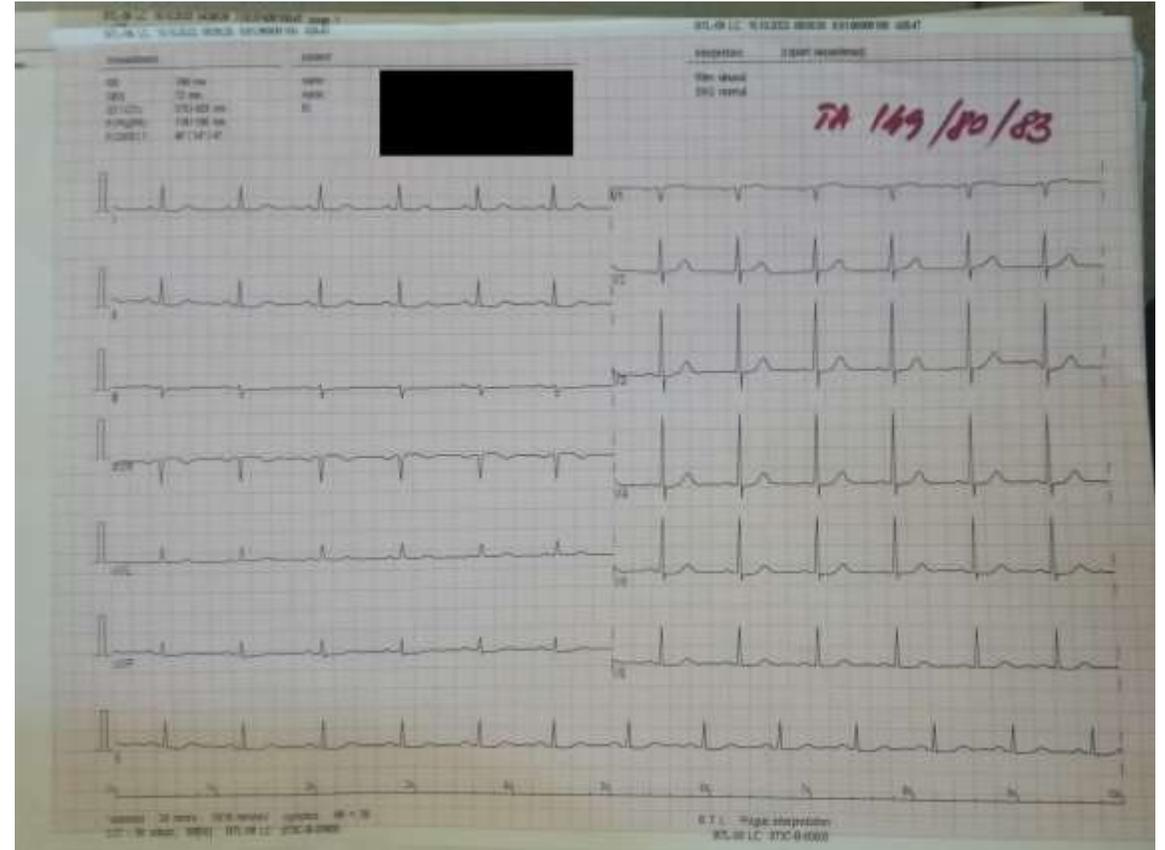
Medical history

- Stage 3 blood hypertension
- Obliterative arteriopathy of the lower limbs
- Chronic kidney disease – stage 2 KDOQI
- Ischemic coronary heart disease with both coronary arteries affected - LAD stent in march 2022, and residual lesions on RCA

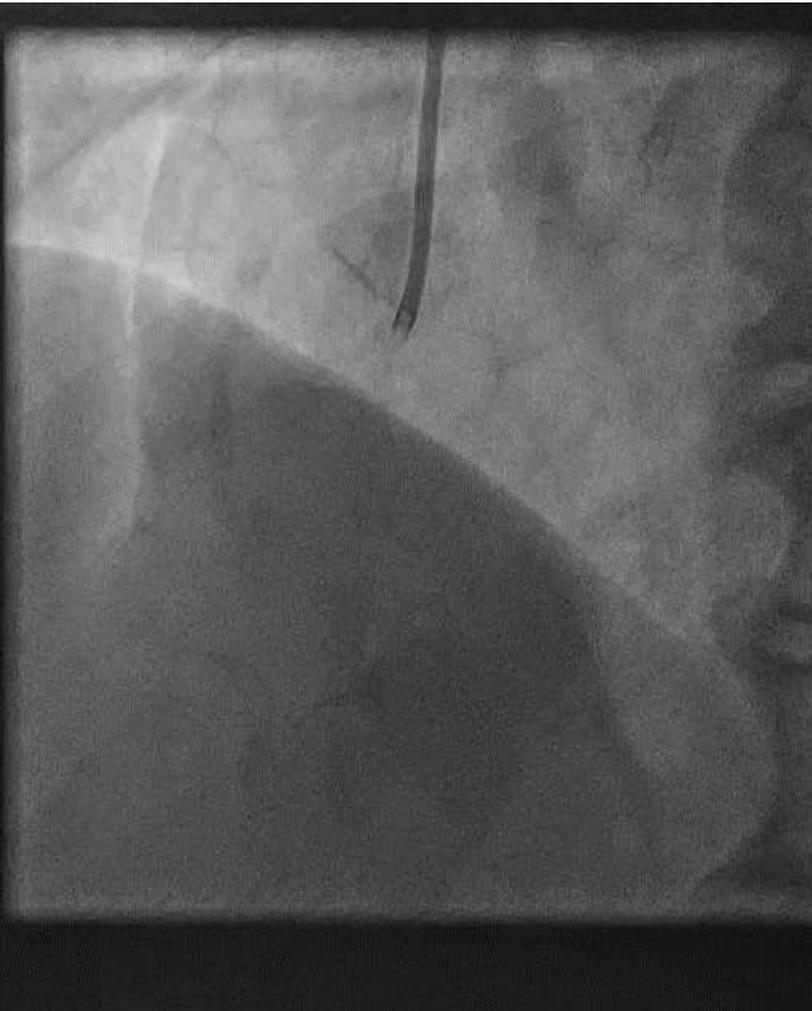
Lab tests and other scans

EKG:

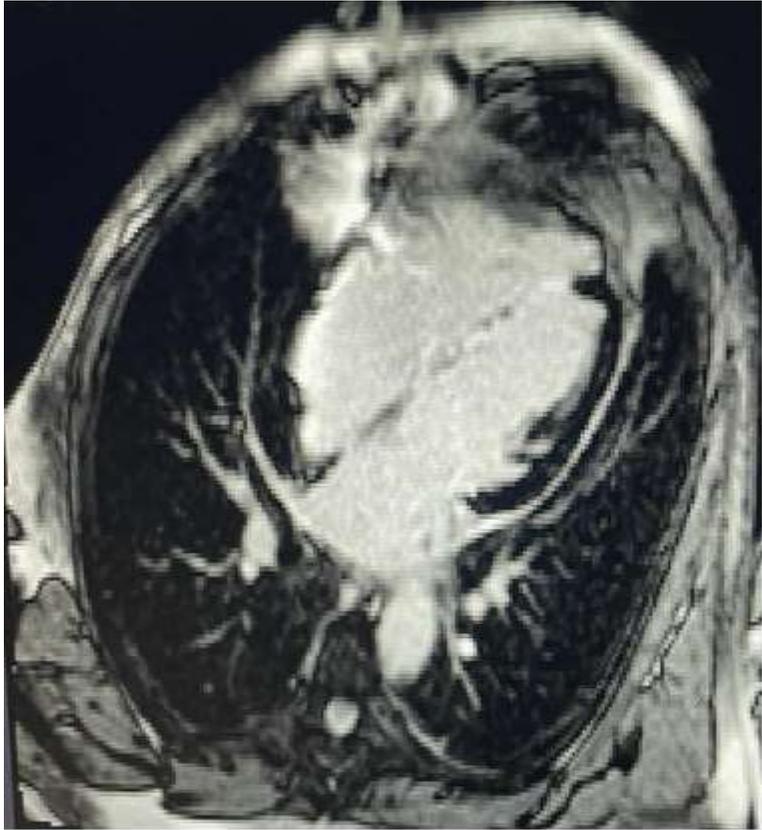
- Synus rhythm, with 79 bpm;
- ST depression – 0.5 mm in D2 and D3;
- Biphasic T waves in V5 and V6
- Slightly modified kidney lab tests
- No significant data from the chest X-ray
- **Cardiac ultrasound:** - EF 45% - moderate hypokinesia infero-lateral wall, mild MR



Angiogram



MRI



Indication

SYNTAX Score II

SYNTAX II

Decision making -between CABG and PCI- guided by the SYNTAX Score II to be endorsed by the Heart Team.

PCI

SYNTAX Score II: 52.9
PCI 4 Year Mortality: 38.3 %

CABG

SYNTAX Score II: 49.1
CABG 4 Year Mortality: 29.6 %

Treatment recommendation ⓘ: CABG or PCI

Patient ID:

Name :

Date of birth:

SYNTAX Score II

PCI

SYNTAX Score II: 52.9
PCI 4 Year Mortality: 38.3 %

CABG

SYNTAX Score II: 49.1
CABG 4 Year Mortality: 29.6 %

Treatment recommendation: CABG or PCI

For reliable results, please do not use your browsers back button - Calculator version 2.28

Myocardial revascularization is recommended when angina persists despite treatment with anti-anginal drugs.

I

A

Percutaneous revascularization of CTOs should be considered in patients with angina resistant to medical therapy or with a large area of documented ischaemia in the territory of the occluded vessel.

IIa

B

Lesion....

J-CTO SCORE SHEET

Version 1.0

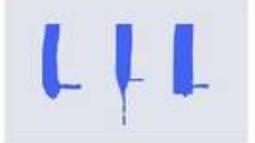
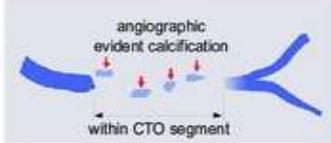
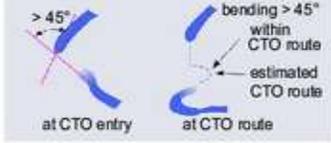
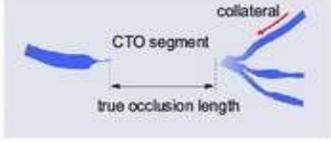
Variables and definitions		
<p>Tapered</p> 	<p>Blunt</p> 	<p>Entry with any tapered tip or dimple indicating direction of true lumen is categorized as "tapered".</p>
		<p>Entry shape</p> <p><input type="checkbox"/> Tapered (0)</p> <p><input checked="" type="checkbox"/> Blunt (1)</p> <p>point</p>
<p>Calcification</p> 	<p>Regardless of severity, 1 point is assigned if any evident calcification is detected within the CTO segment.</p>	<p>Calcification</p> <p><input type="checkbox"/> Absence (0)</p> <p><input checked="" type="checkbox"/> Presence (1)</p> <p>point</p>
<p>Bending > 45 degrees</p> 	<p>One point is assigned if bending > 45 degrees is detected within the CTO segment. Any tortuosity separated from the CTO segment is excluded from this assessment.</p>	<p>Bending > 45°</p> <p><input type="checkbox"/> Absence (0)</p> <p><input type="checkbox"/> Presence (1)</p> <p>point</p>
<p>Occlusion length</p> 	<p>Using good collateral images, try to measure "true" distance of occlusion, which tends to be shorter than the first impression.</p>	<p>Occl.Length</p> <p><input type="checkbox"/> < 20 mm (0)</p> <p><input checked="" type="checkbox"/> ≥ 20 mm (1)</p> <p>point</p>
<p>Re-try lesion</p> <p>Is this Re-try (2nd attempt) lesion> (previously attempted but failed)</p>		<p>Re-try lesion</p> <p><input type="checkbox"/> No (0)</p> <p><input type="checkbox"/> Yes (1)</p> <p>point</p>
<p>Category of difficulty (total point)</p> <p><input type="checkbox"/> easy (0) <input type="checkbox"/> Intermediate (1)</p> <p><input type="checkbox"/> difficult (2) <input checked="" type="checkbox"/> very difficult (≥ 3)</p>		<p>Total</p> <p>3 points</p>

Table 1: Rentrop and Werner Classification of Coronary Collateral Circulation

Rentrop Classification¹⁵ (Developed for Occluded and Non-occluded Arteries)

0	no filling of collateral vessels
1	filling of collateral vessels without any epicardial filling of the target artery
2	partial epicardial filling by collateral vessels of the target artery
3	complete epicardial filling by collateral vessels of the target artery (In CTOs, Rentrop 3 is prevalent in 85% of lesions)

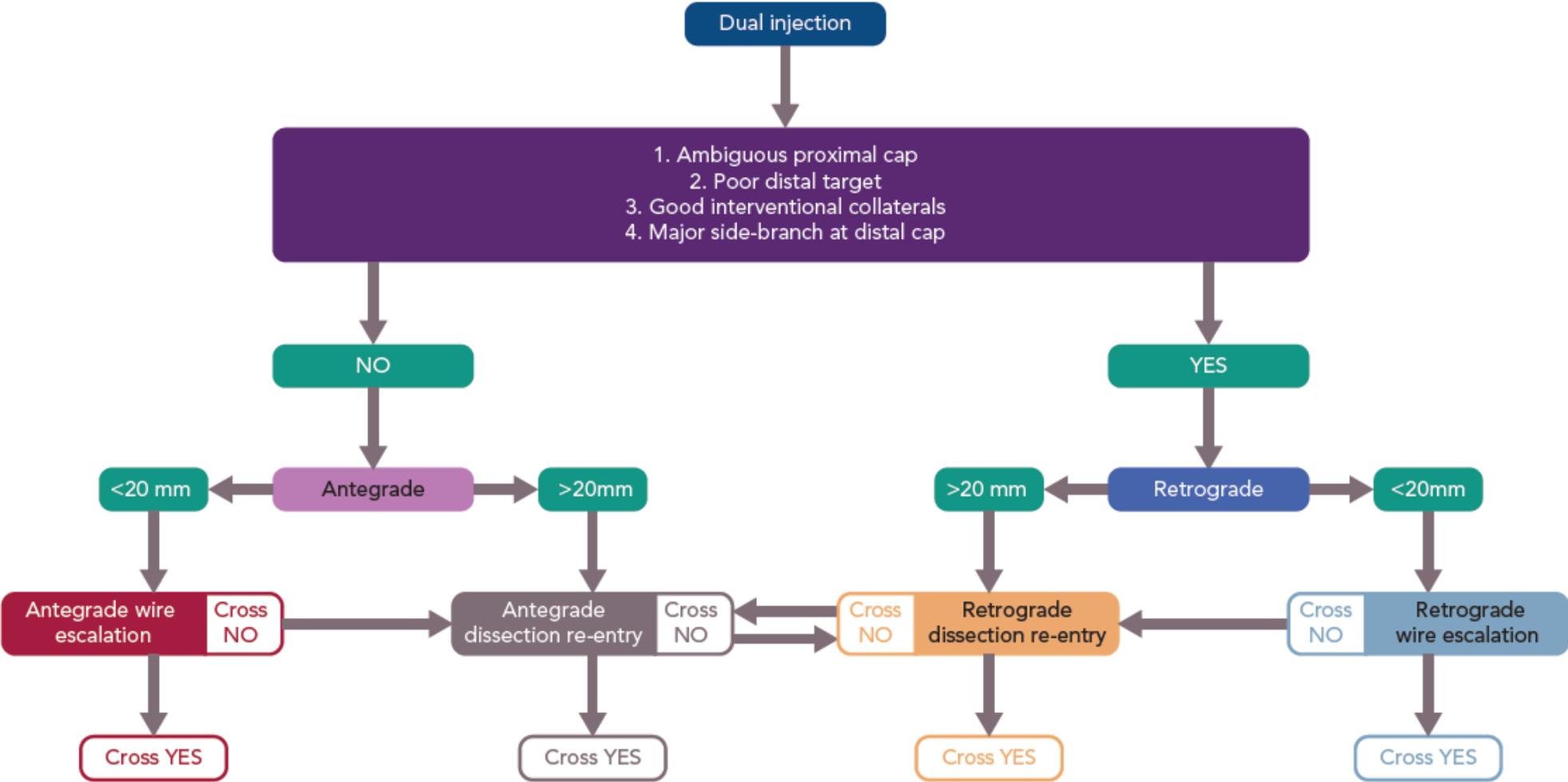
Collateral Connection Grade¹³

CC0	no continuous connection
CC1	threadlike continuous connection
CC2	side branch-like connection (≥0.4 mm)
CC3	>1 mm diameter of direct connection (not included in the original description)

CTO = chronic total occlusion.

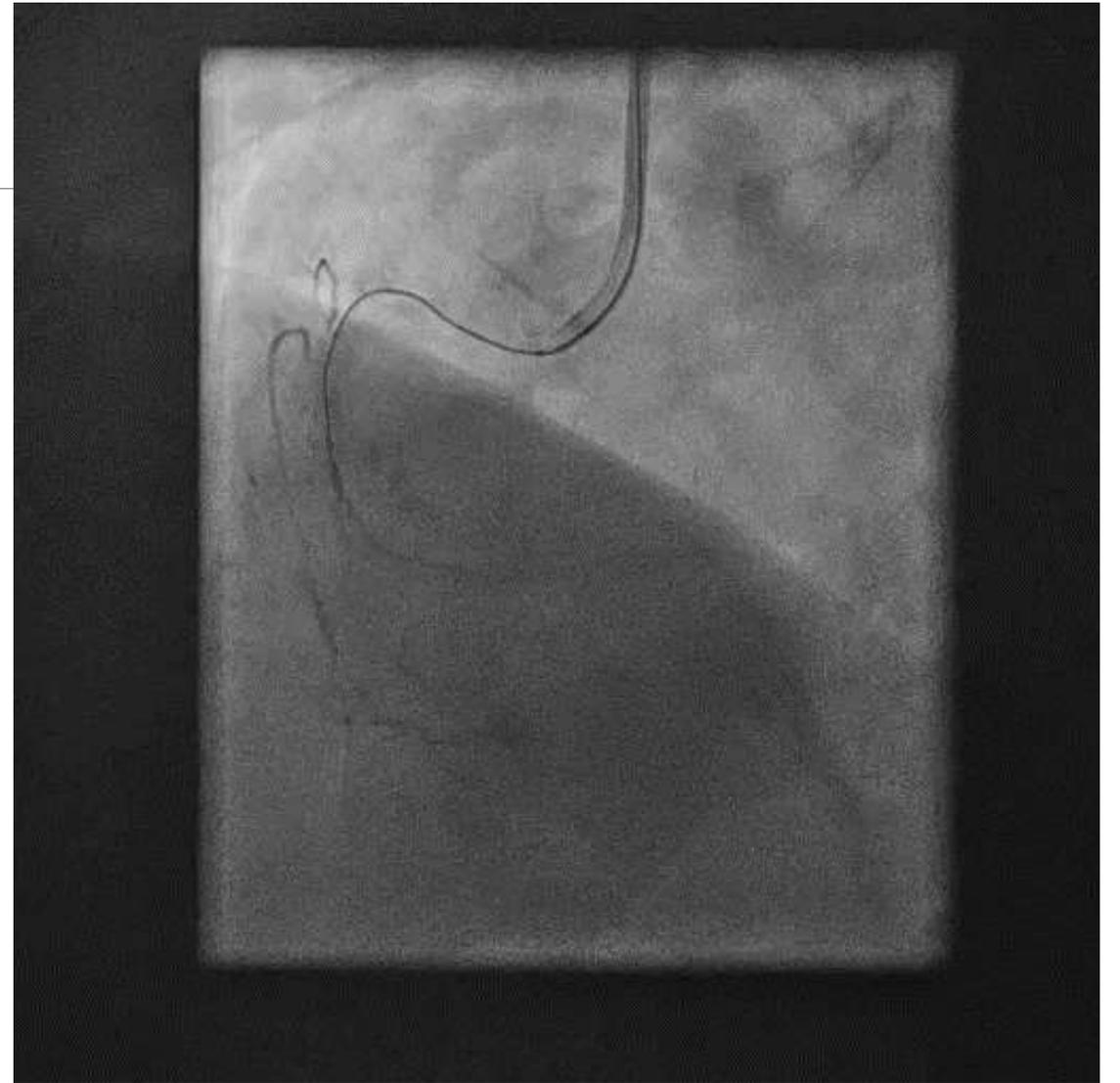
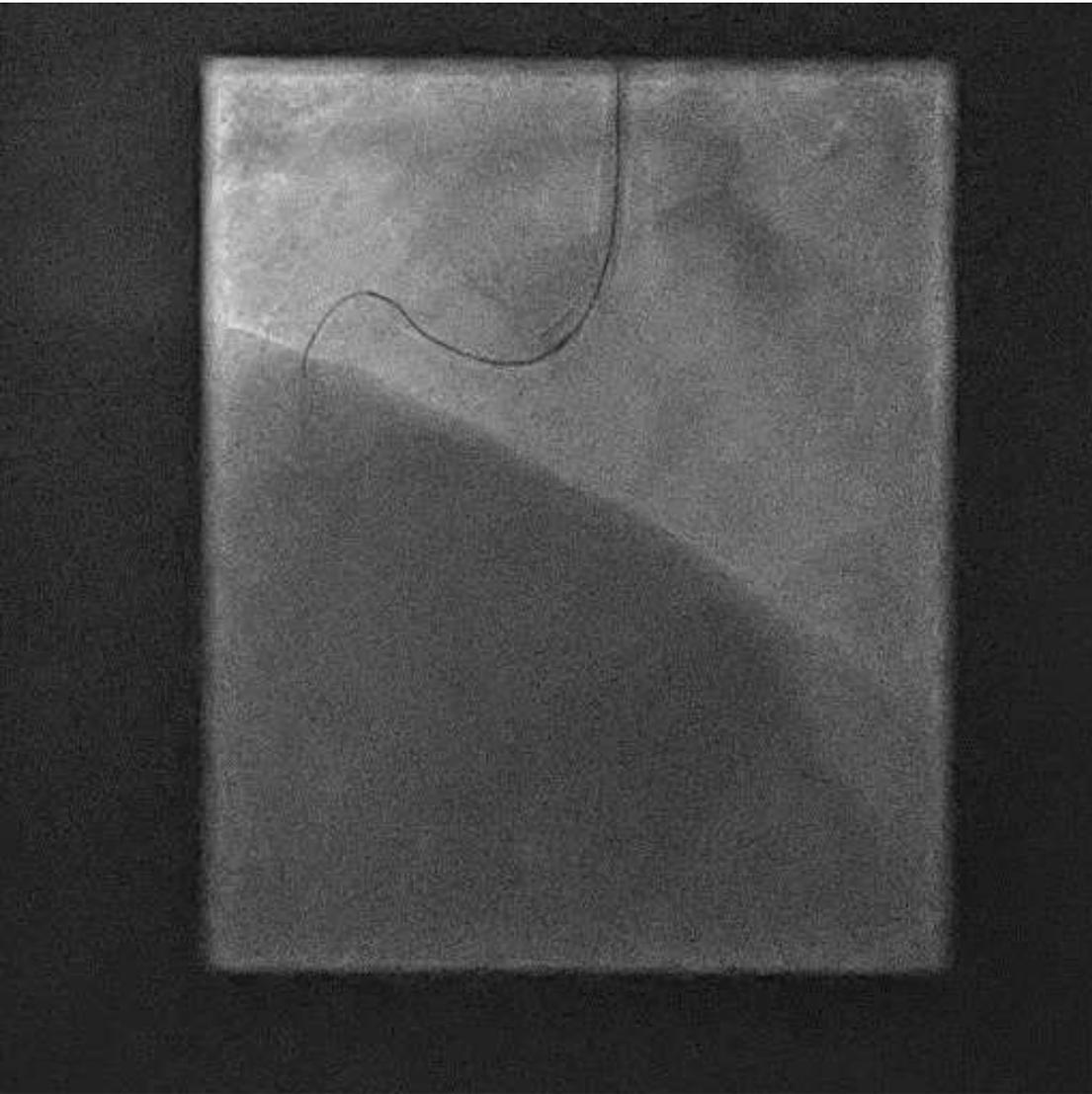
Basic approach

Figure 1: The Hybrid Chronic Total Occlusion Algorithm

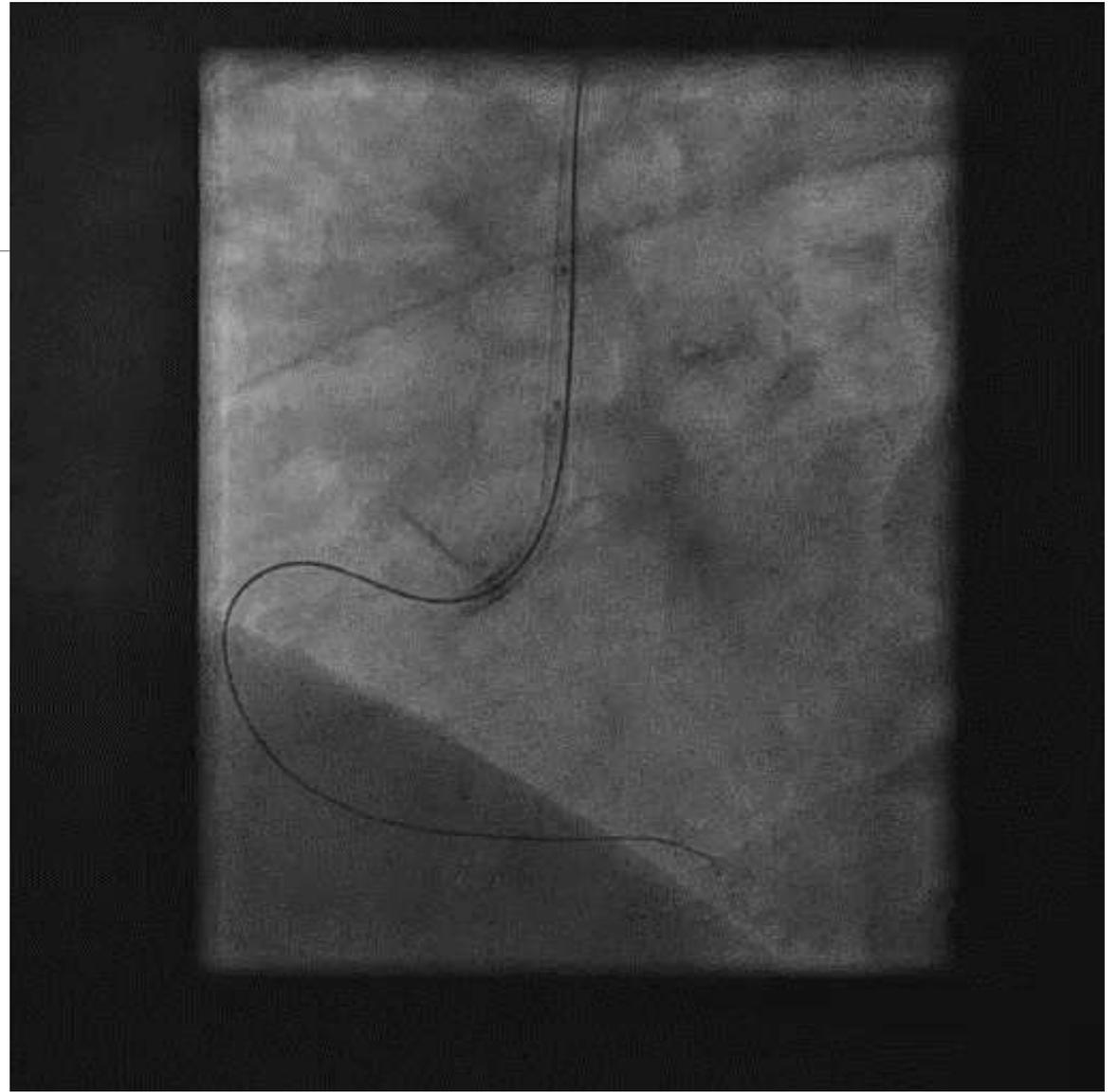
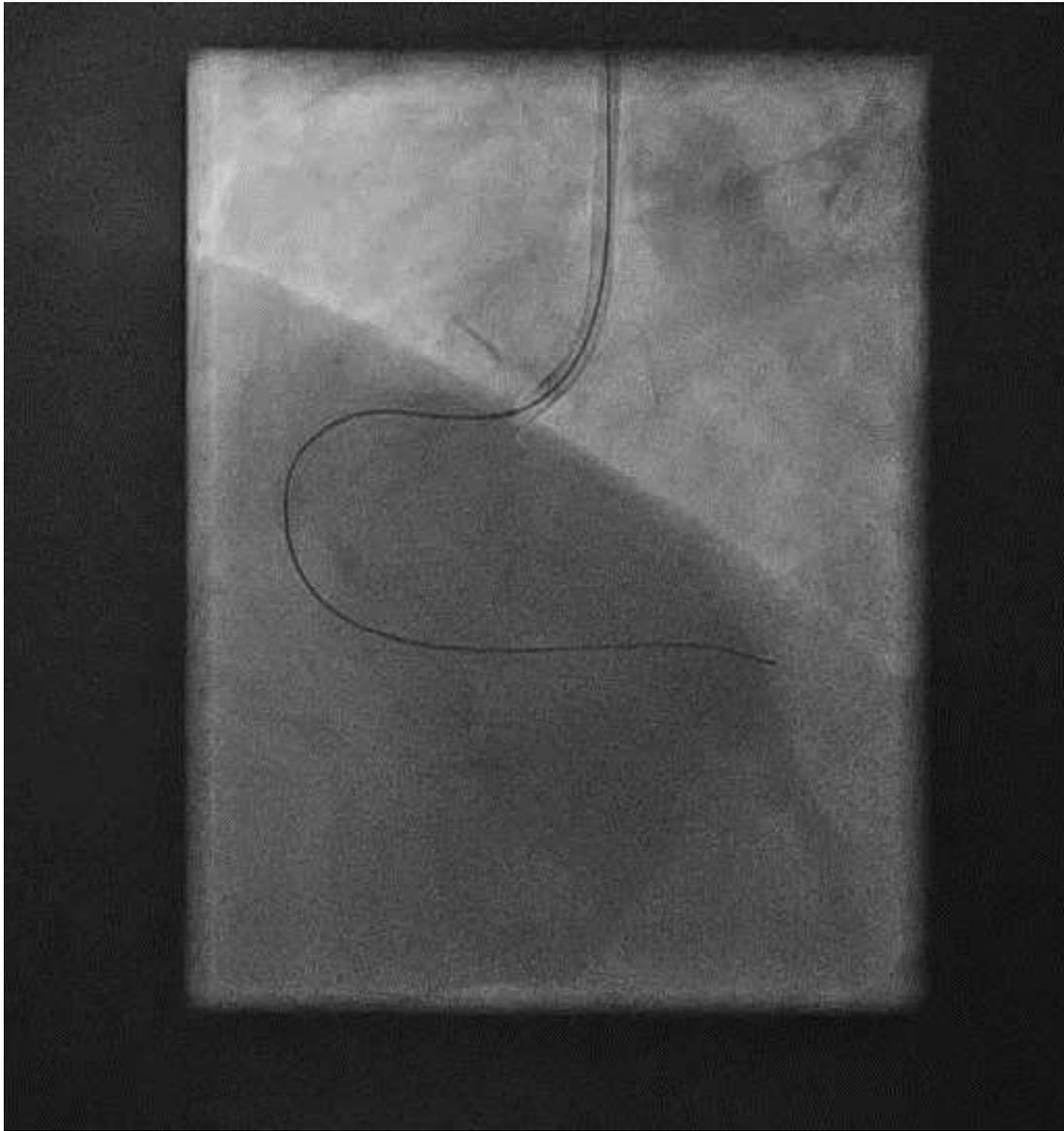


Source: Vascular Perspectives. Reproduced with permission from Vascular Perspectives.

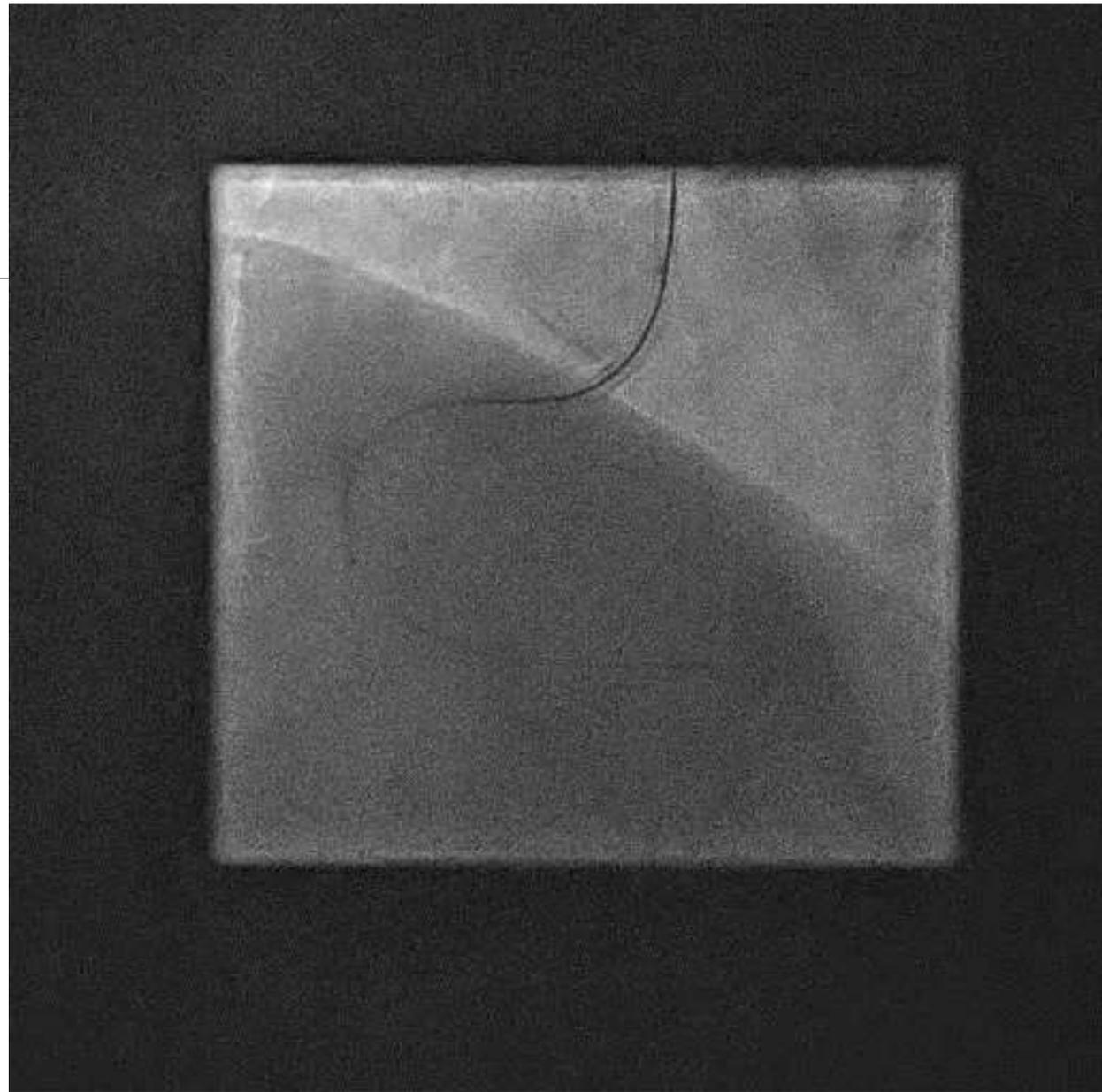
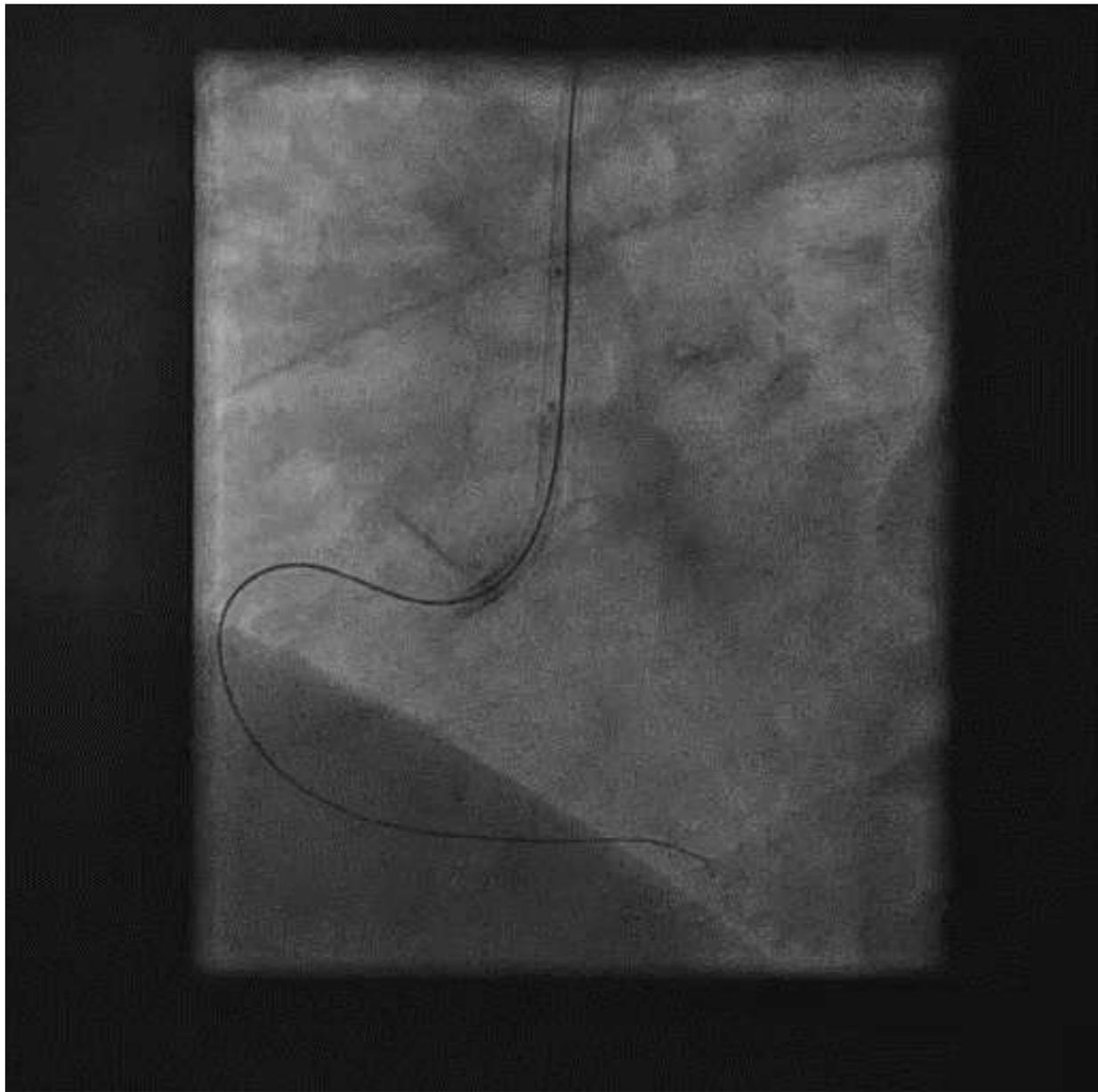
AWE



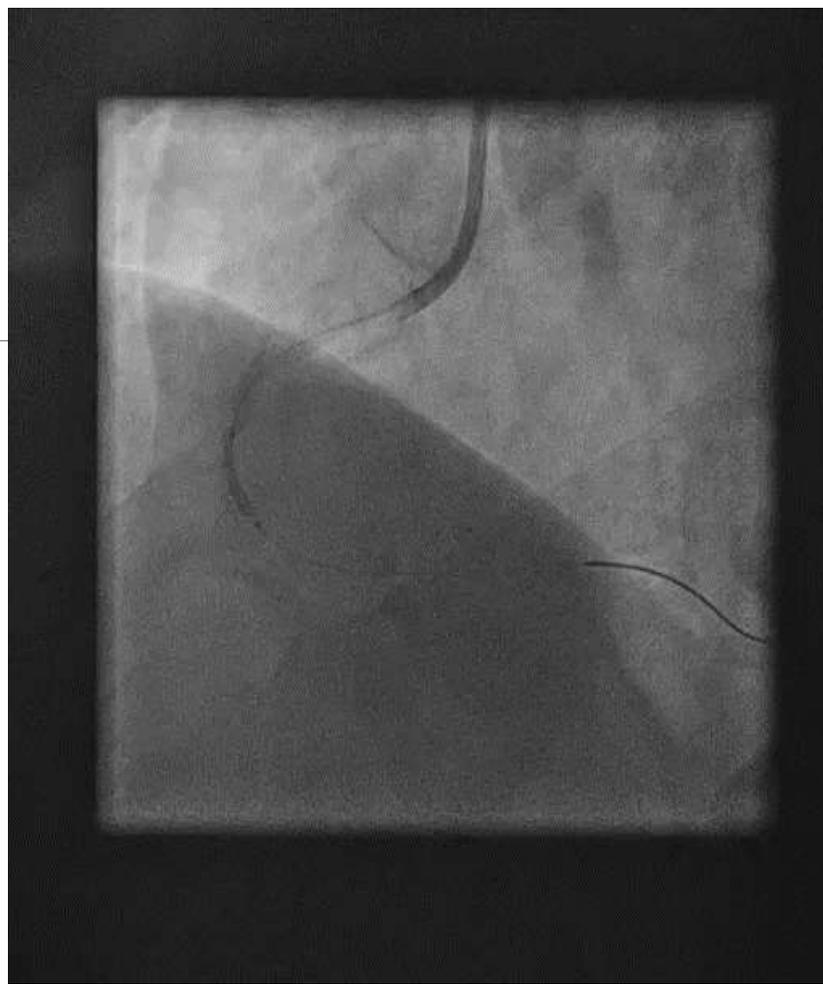
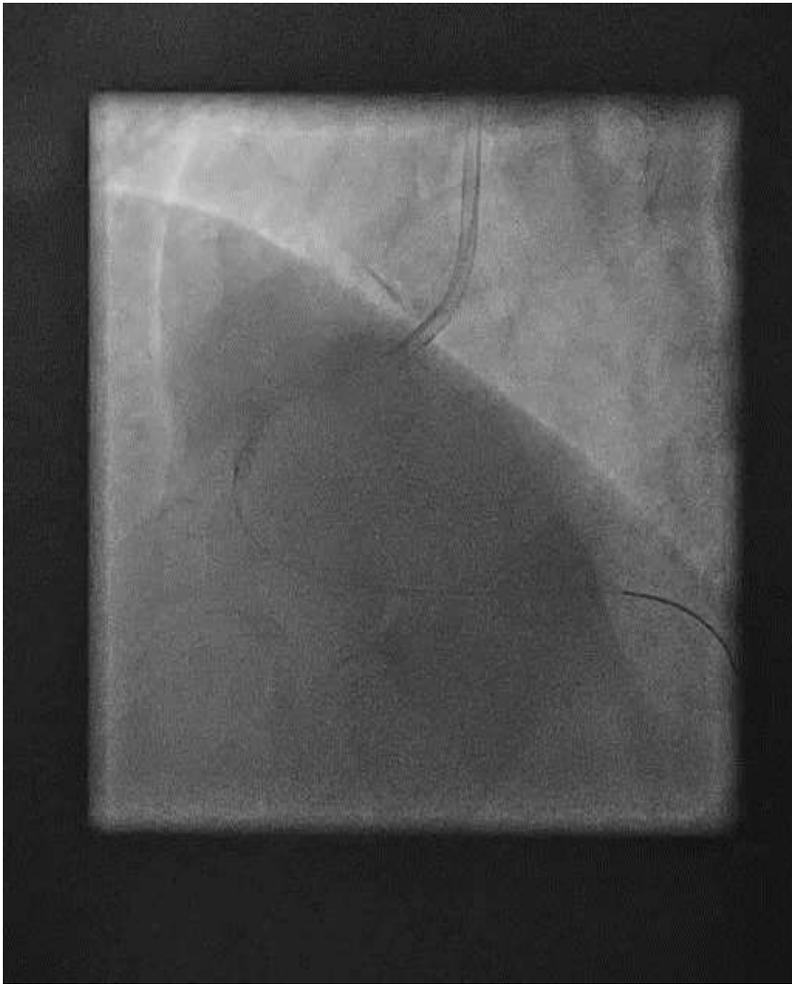
Gear: JR4 GC, Fielder XTR, Gaia 2



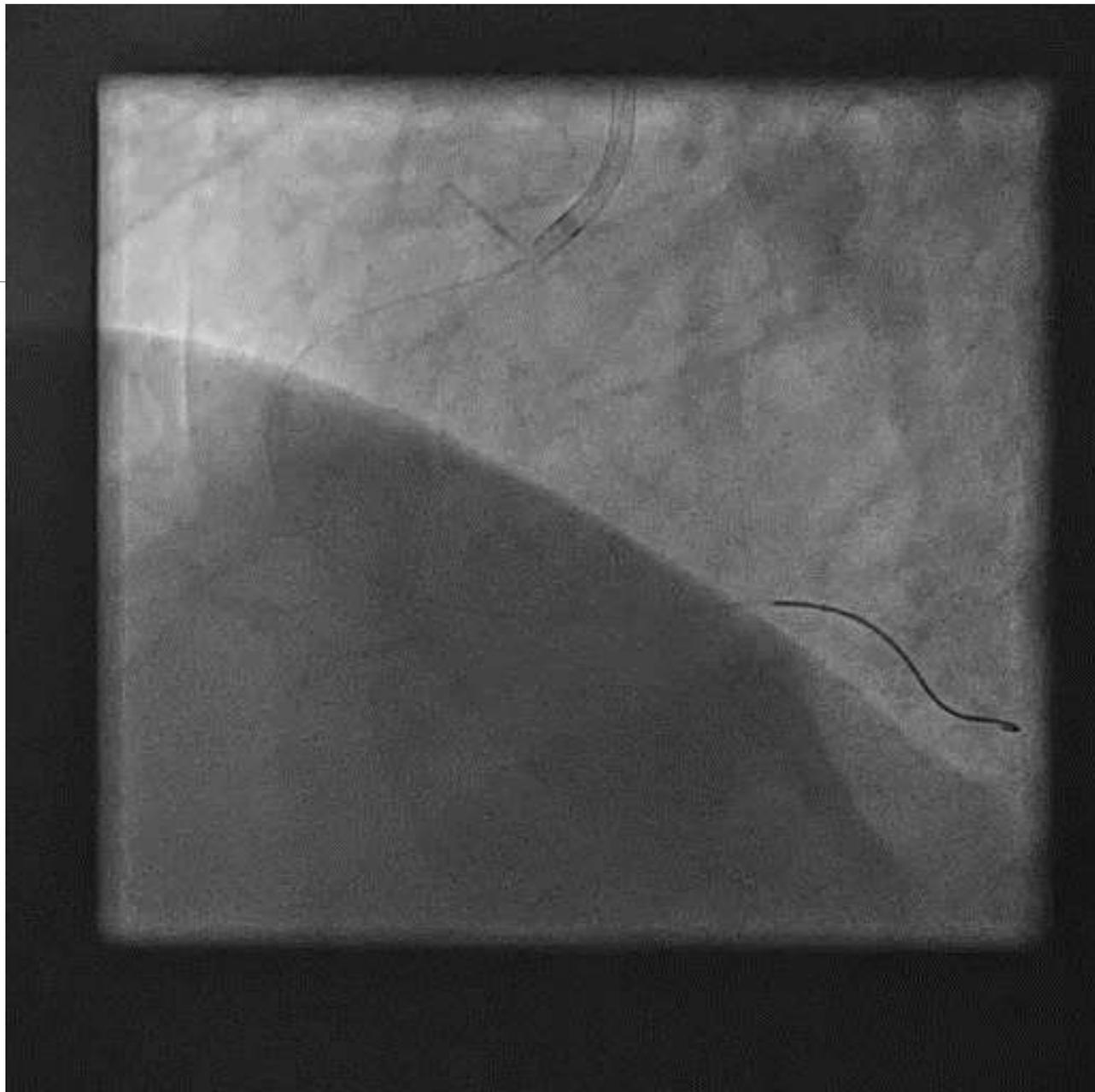
No passage 1.2x12mm NCB, trapping 2.0x20mm SCB 6atm



Switch Corsair Pro XS MC, BHW



NCB: 1.2x12mm, 1.5x15mm, 2.0x20, 2.5x15mm, 22-24atm



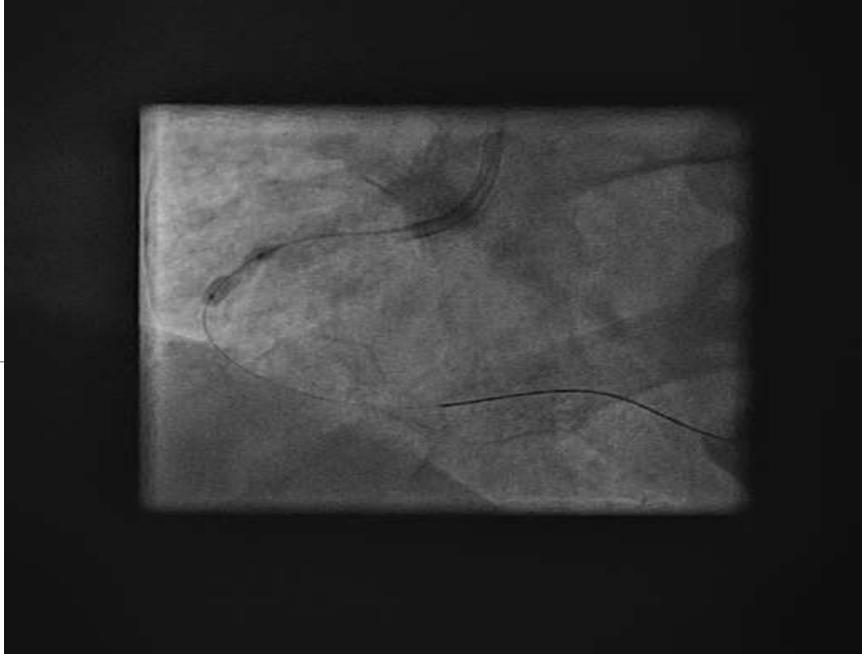
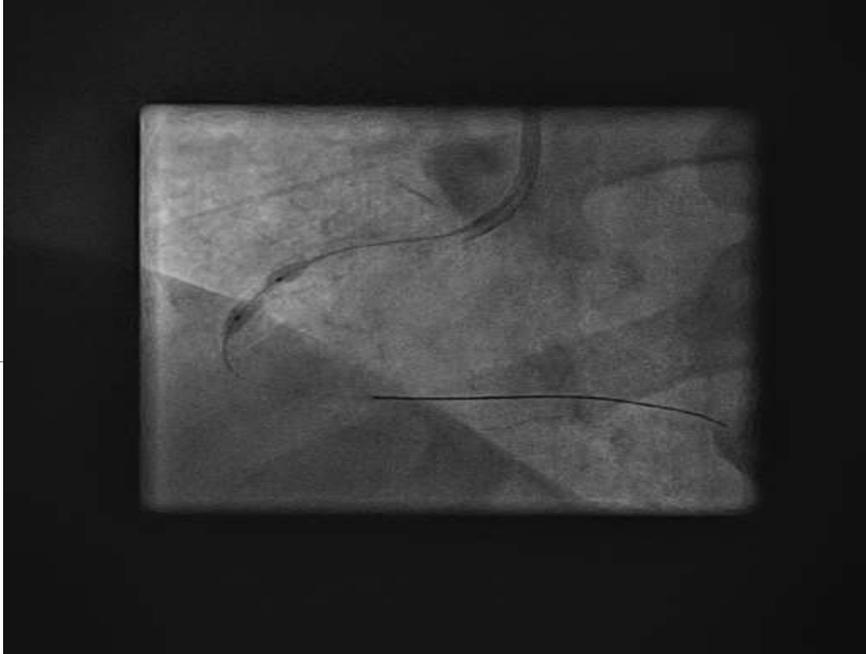
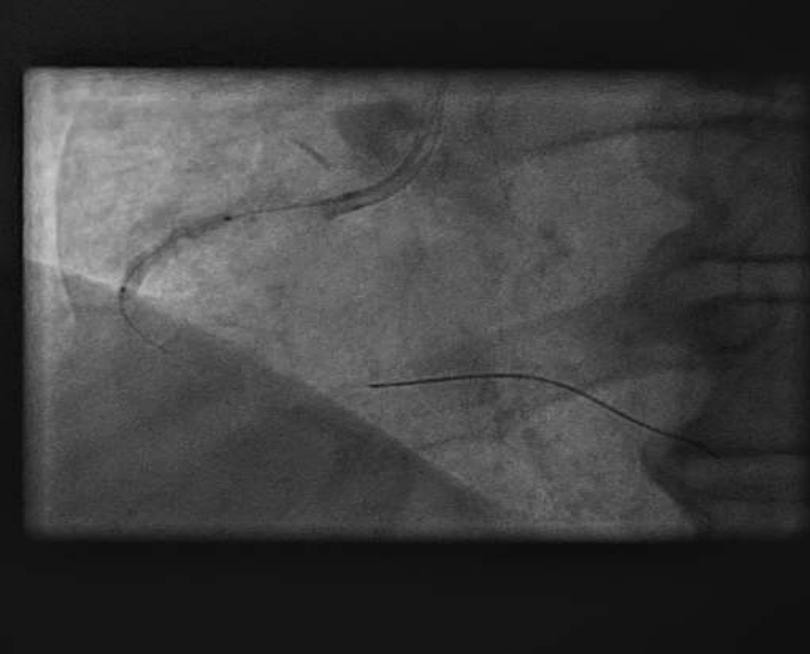
Result



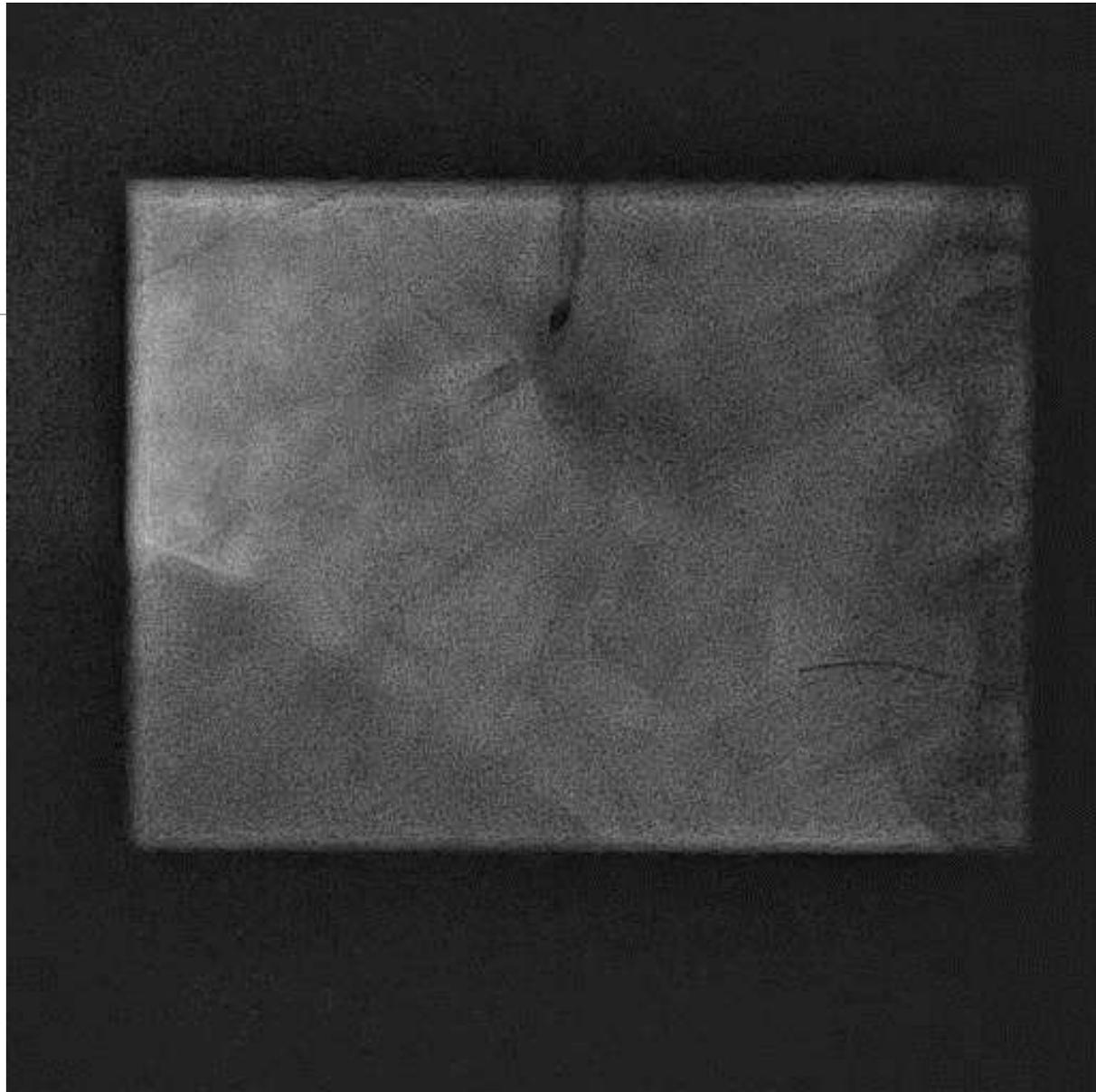
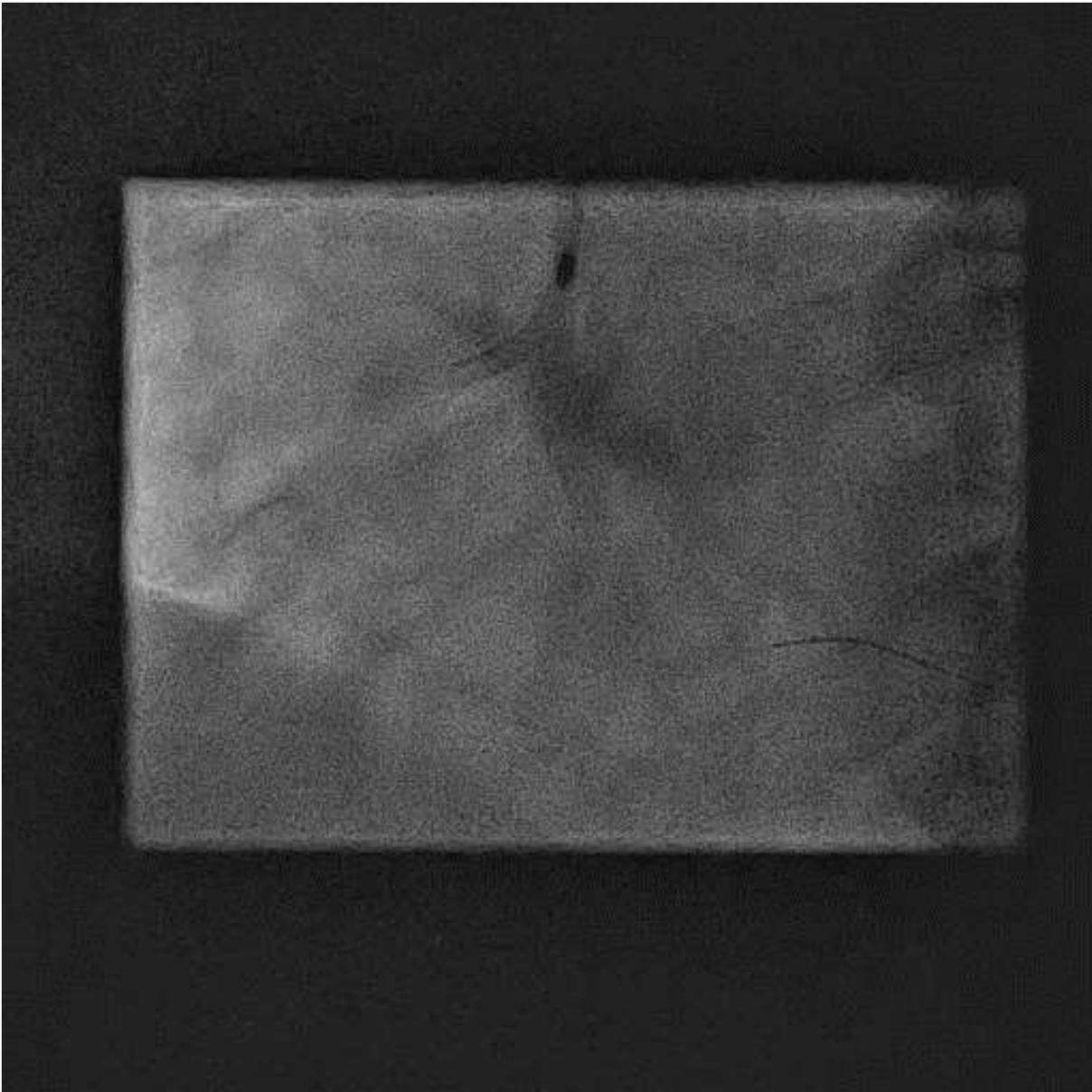
Switch RotaWire Floppy, 1,5mm burr



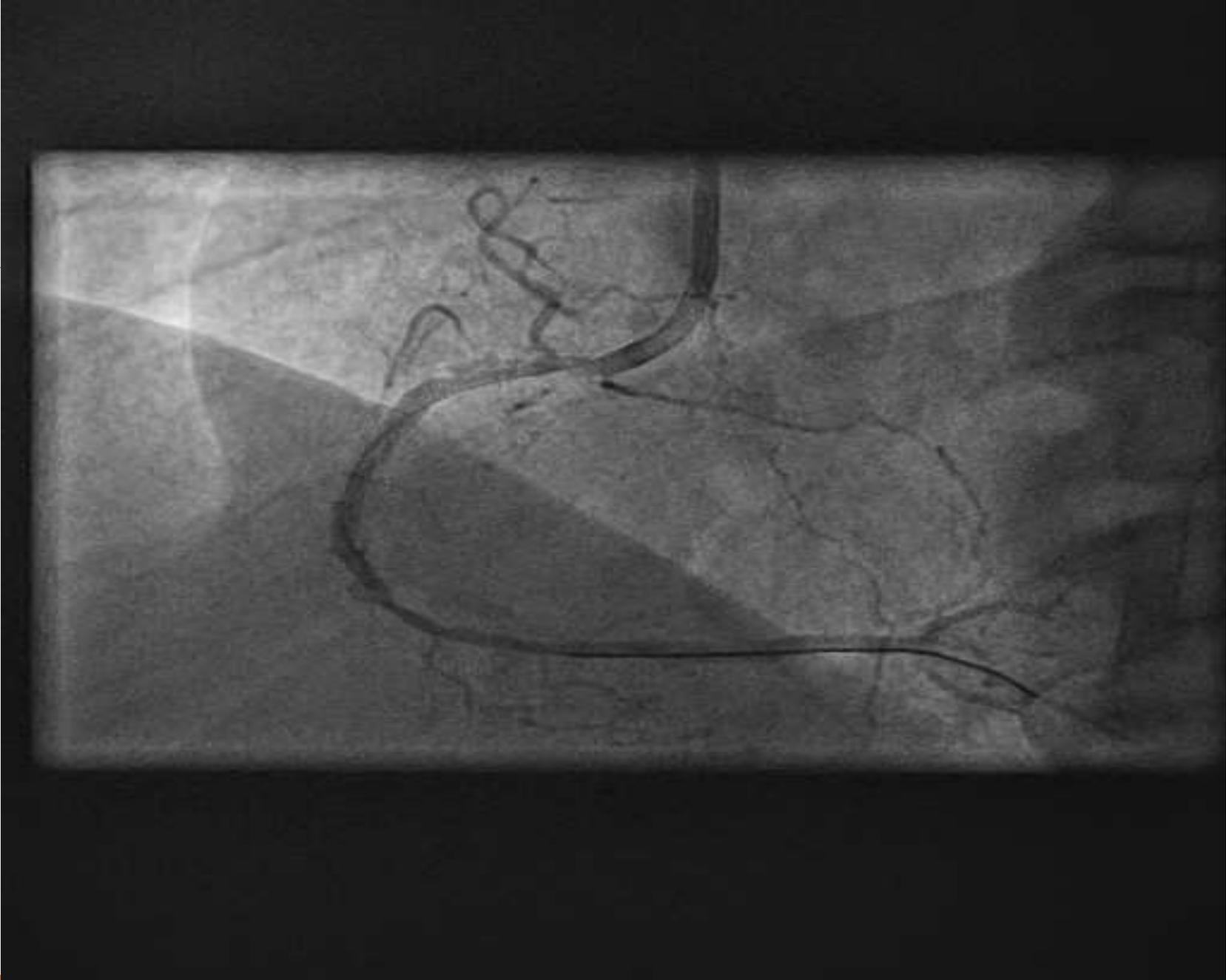
Result after Rota



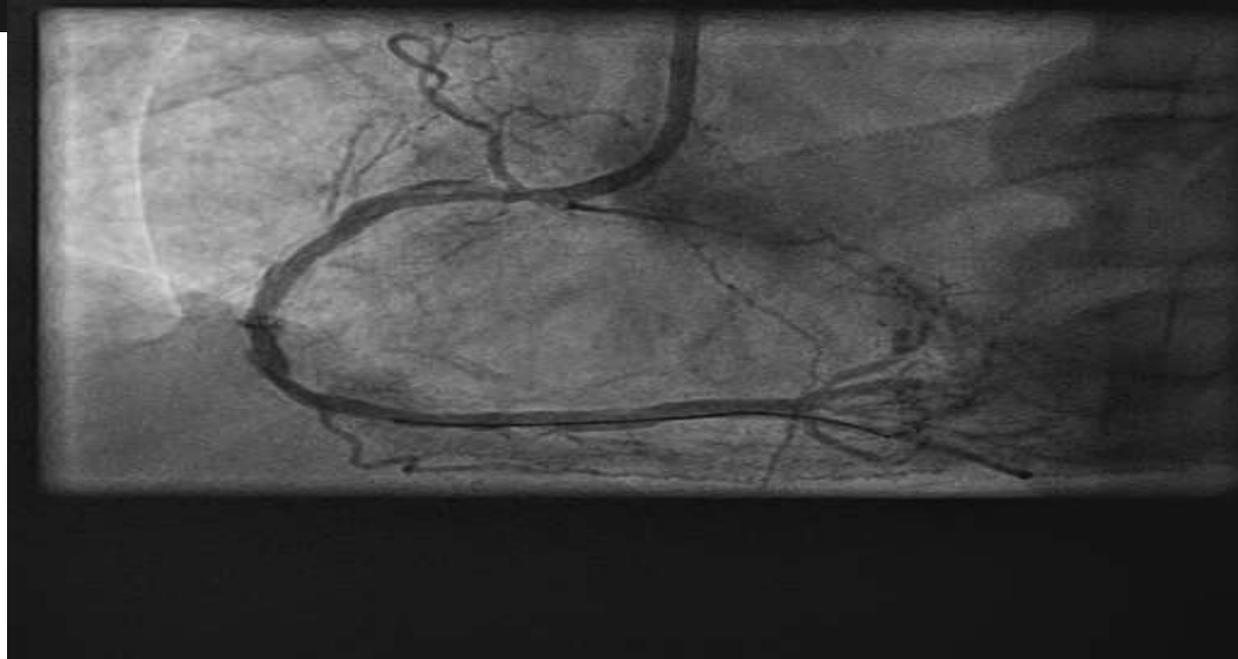
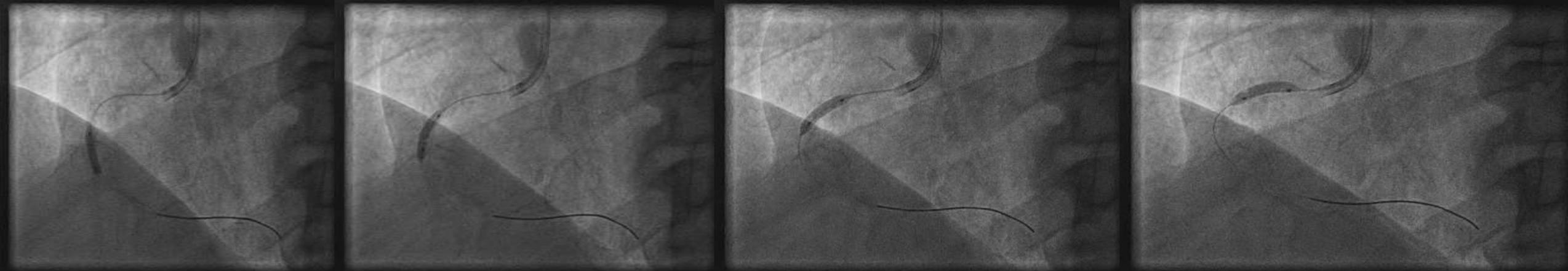
NCB: 1.2x12mm, 1.5x15mm, 2.0x20mm, 2.5x15mm, 22-24atm, Cutting 2.75x10mm 12atm



Rota burr 1.75mm second passage



Result after 2nd Burr

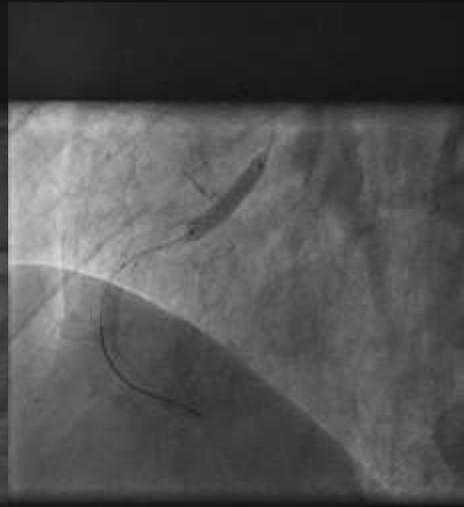
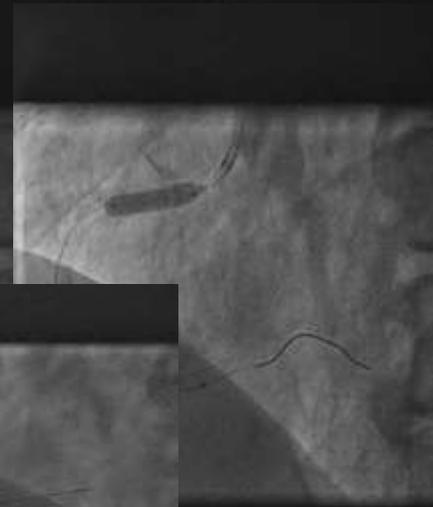
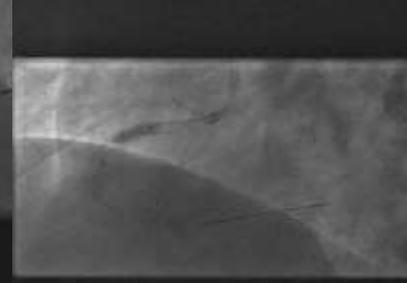
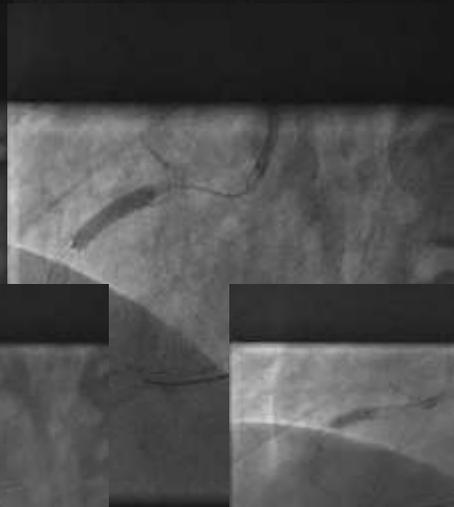
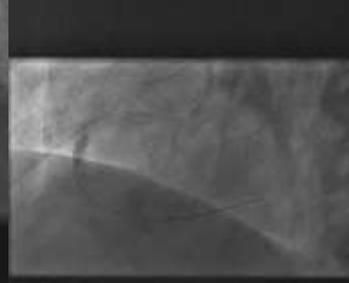
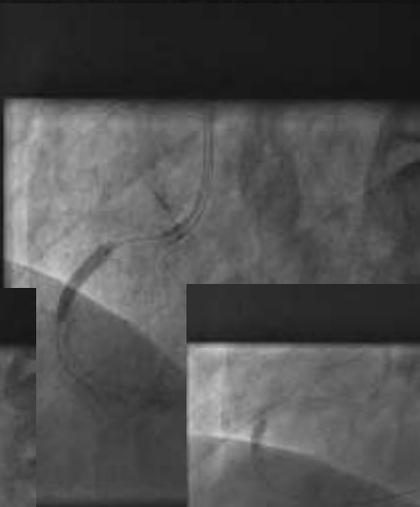
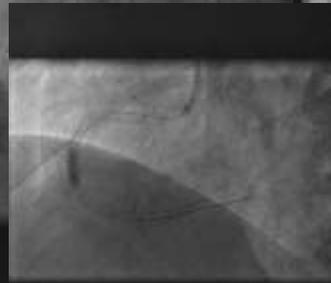
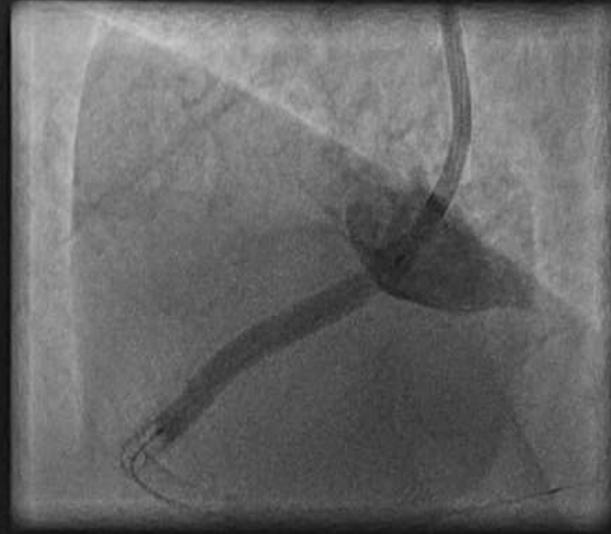
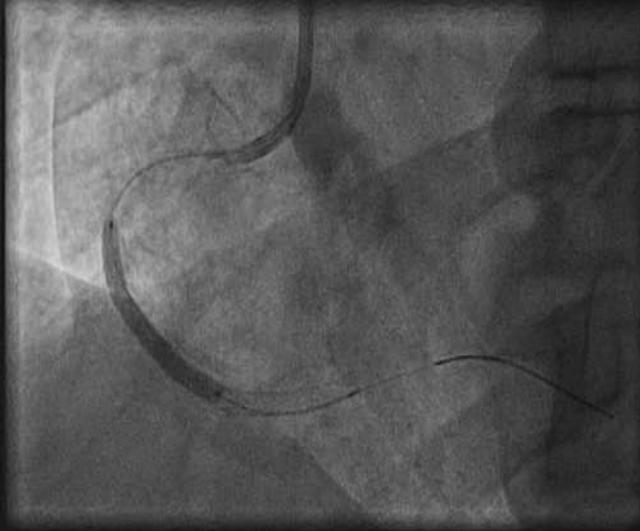
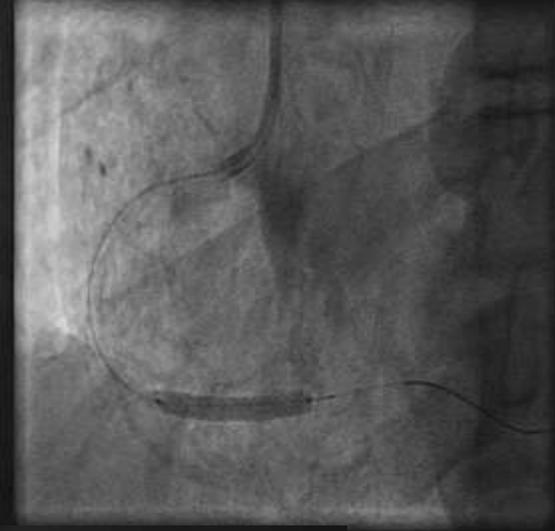


NCB: 2.0x20mm, 2.5x15mm, 2.75x20mm 22-24atm

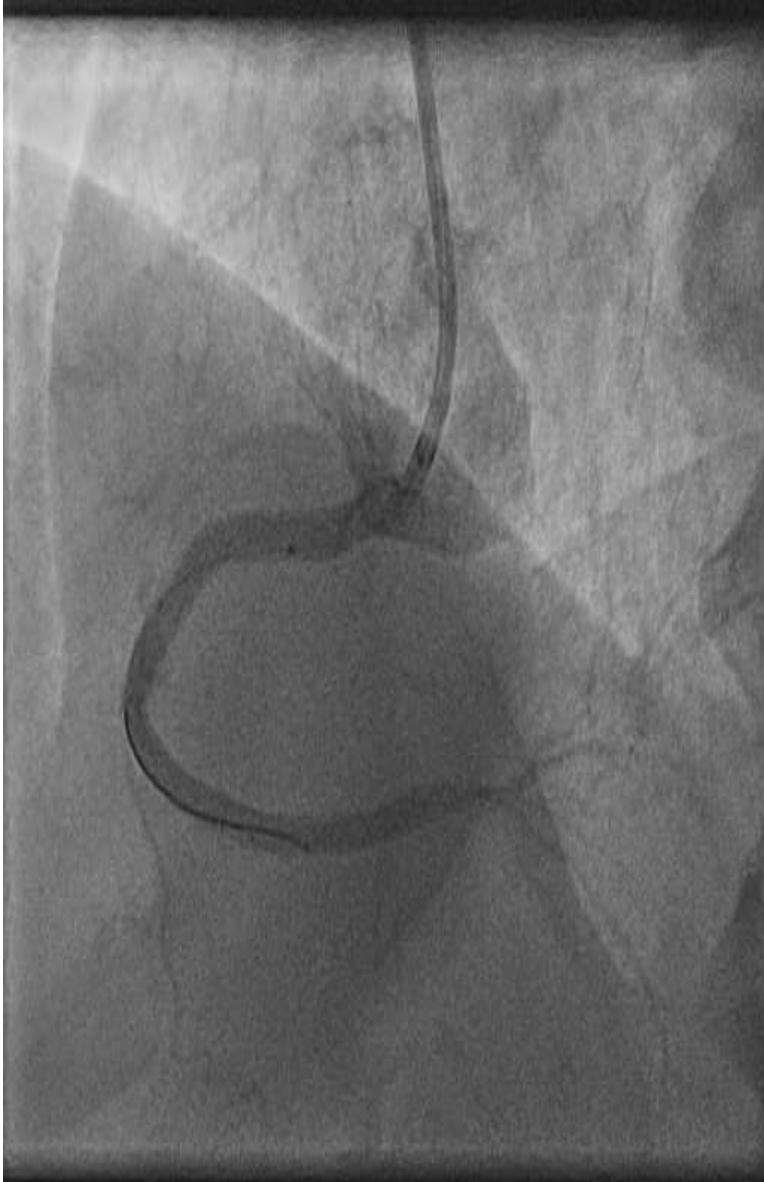
Resolute Onix (Medtronic)
2.75x30mm & 16 atm

Resolute Onix (Medtronic)
2.75x26mm & 18 atm

Resolute Onix (Medtronic) 3.5x34mm & 18 atm



NCB: 3.0x12mm, 3.25x15 mm, 3.75x8mm and 4.0x20mm & 20-24atm



FINAL RESULT

Problems

- ❑ First thought: problems with crossing the lesion – we had problems with lesion preparation
- ❑ No availability of imaging at the moment – IVUS, OCT
- ❑ No availability of IVL or OPNC

Thank you very much!

