How We Treat MVD Patient with CTO in Malaysia and Improve Outcomes with These Challenging Procedures

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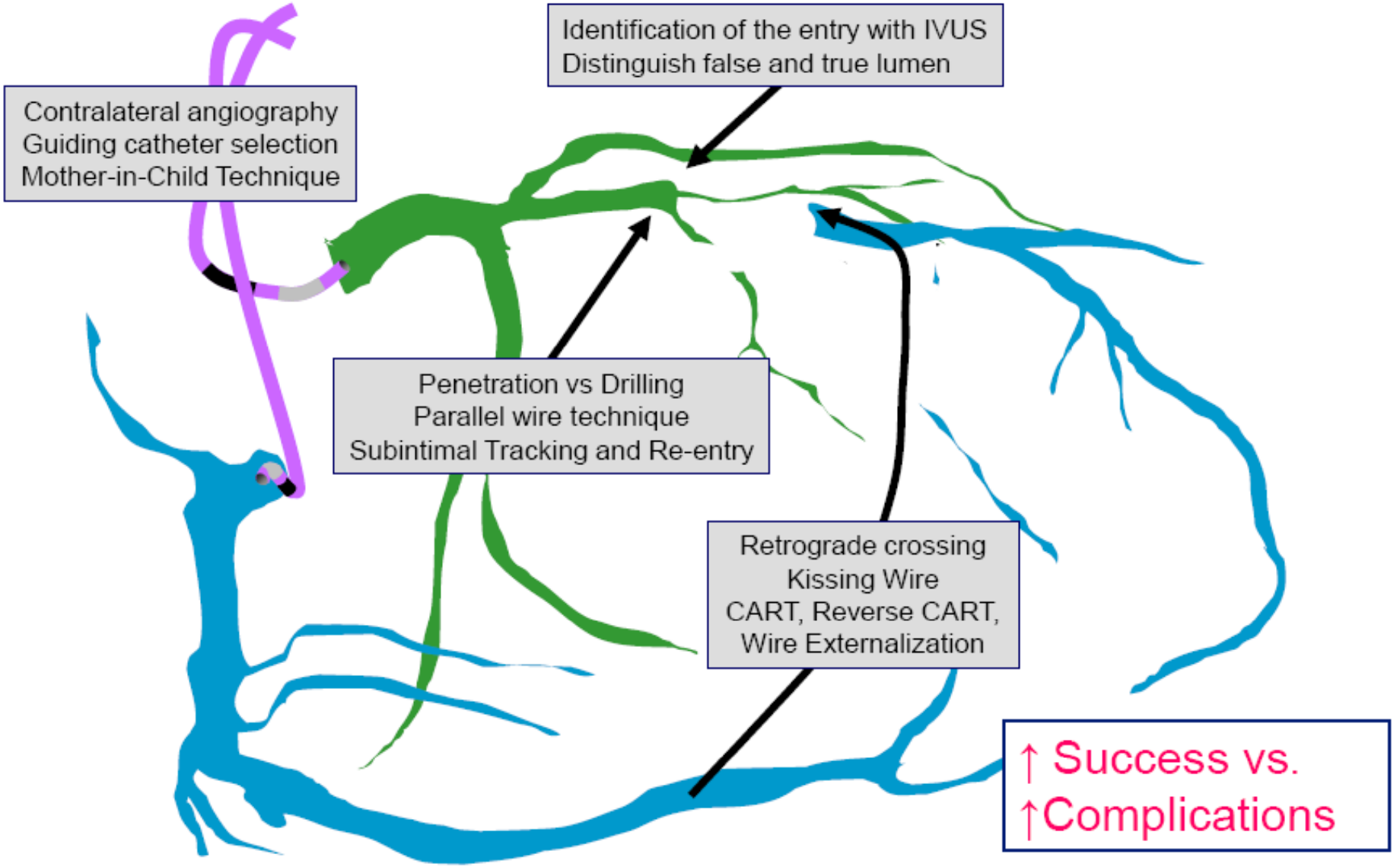
National Heart Institute

Principles of CTO Revascularization

Advanced Strategies and Technique



65 year old male

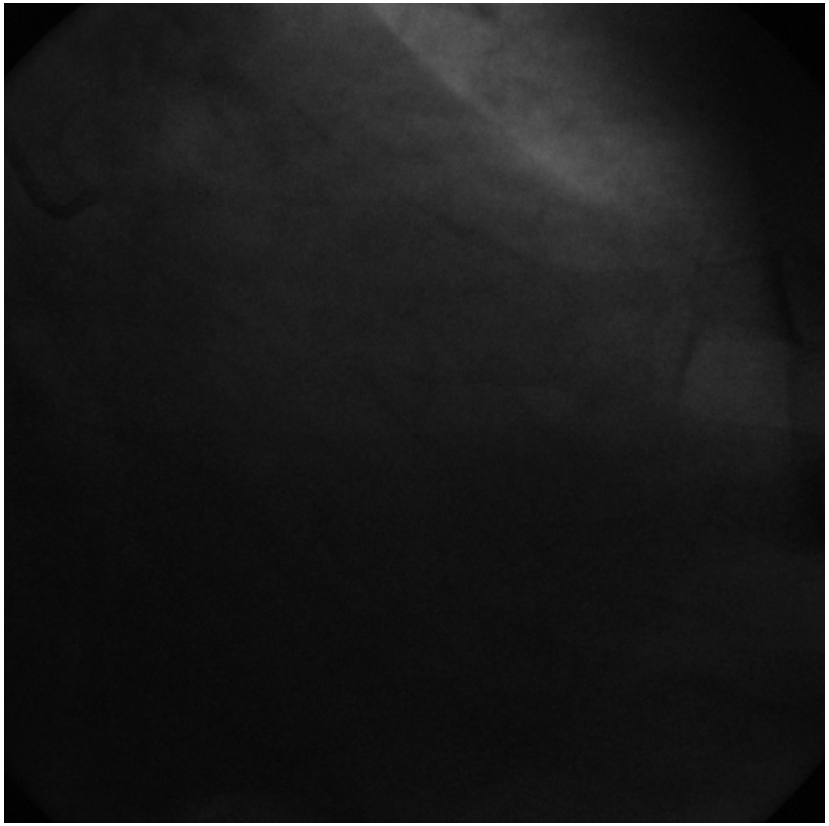
Presented with breathlessness

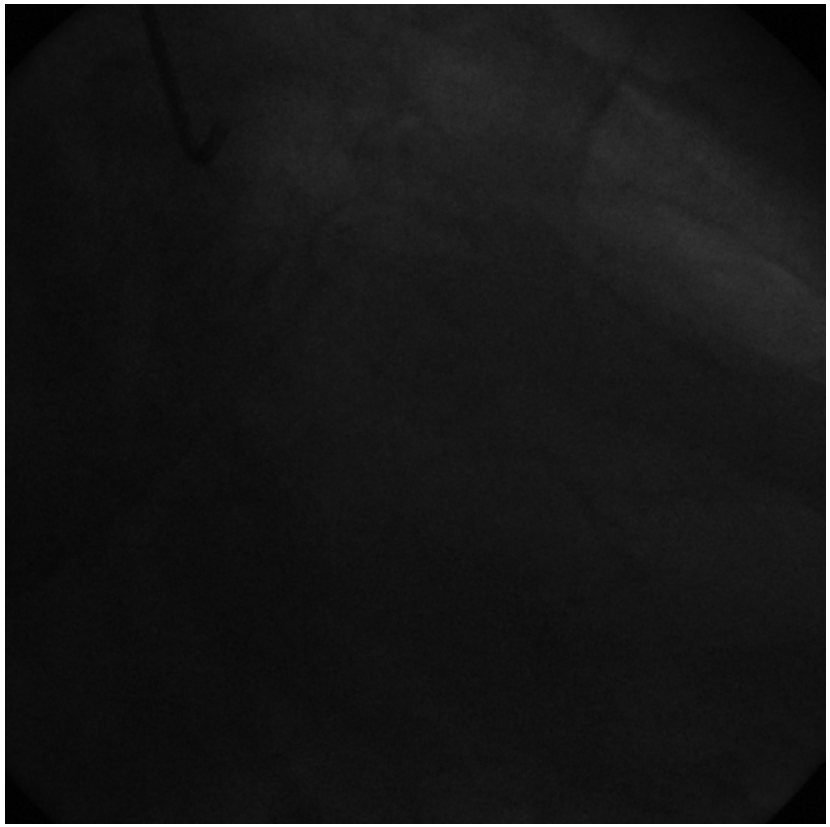
Previous inferior myocardial infarction

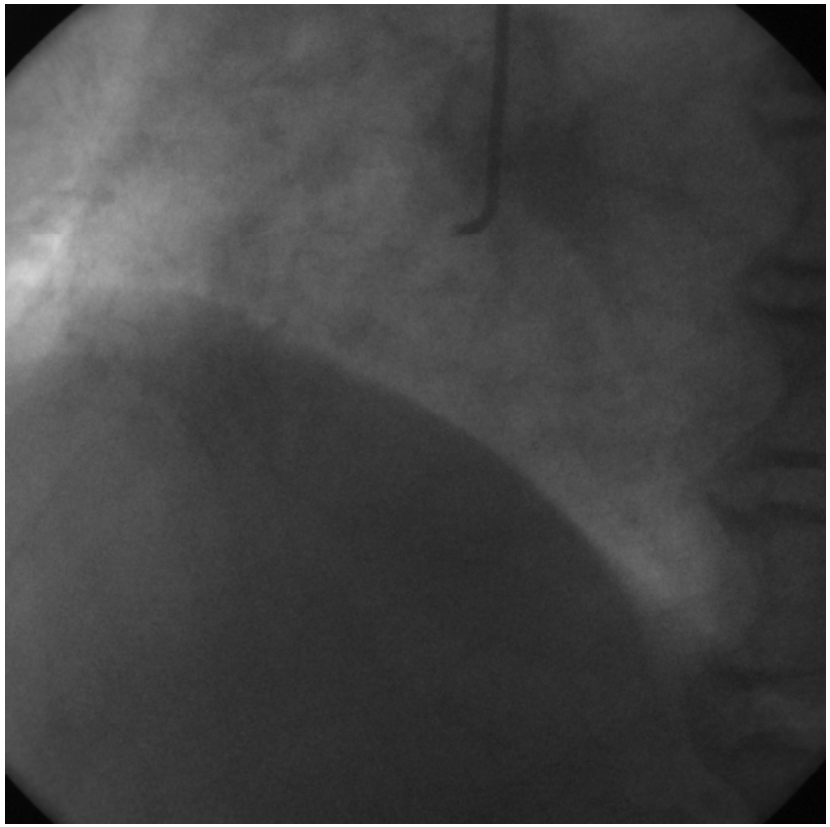
Poor LV function

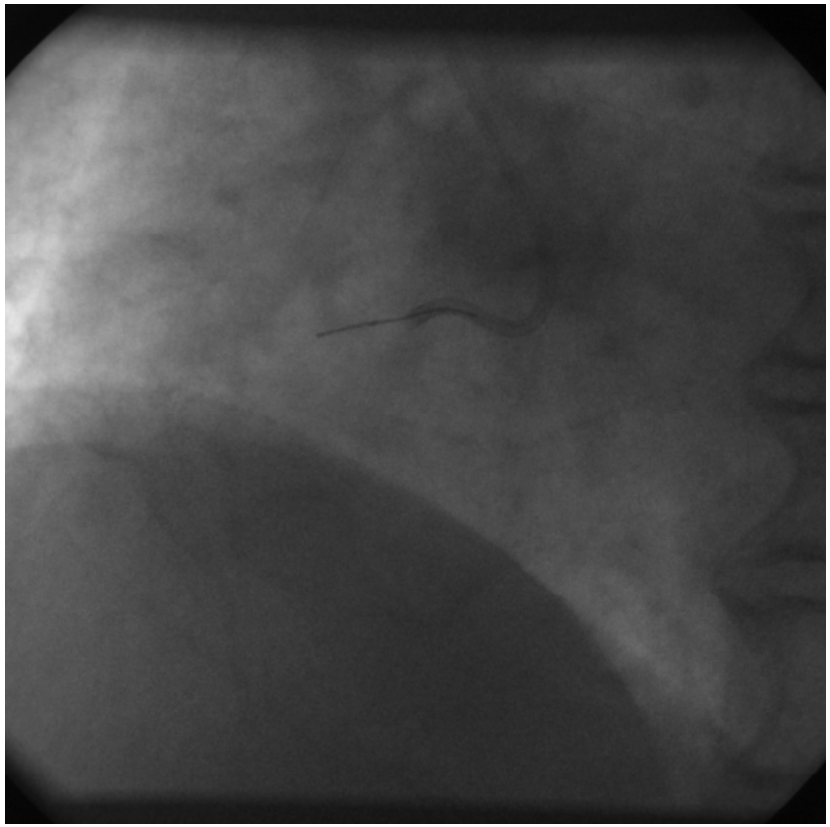
Technetium scan - viable myocardium in all territories

Impaired global LV function (EF 32%)

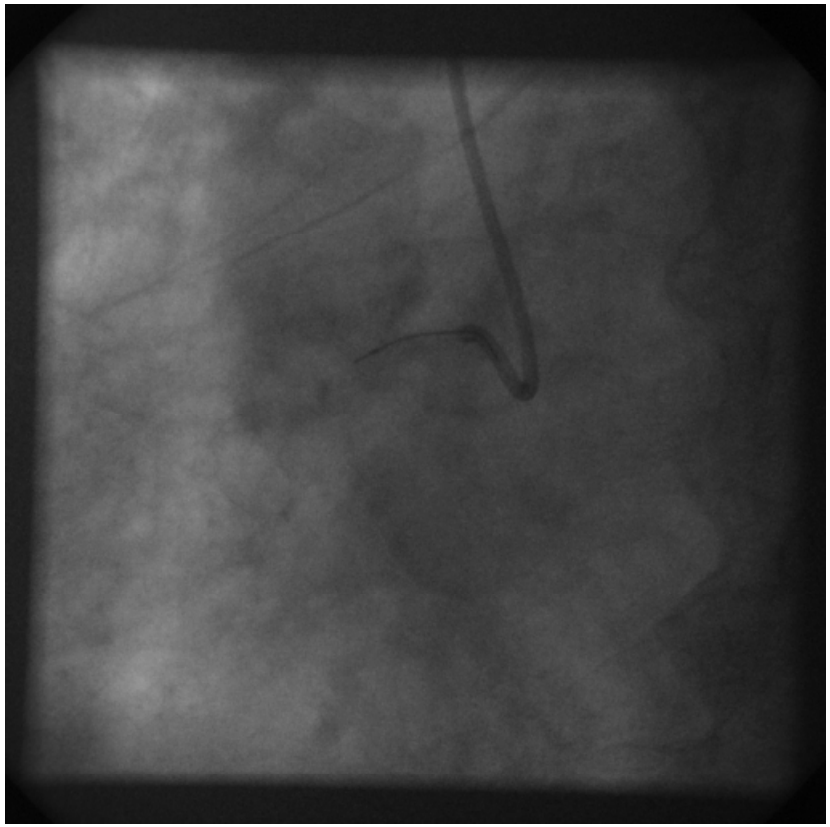




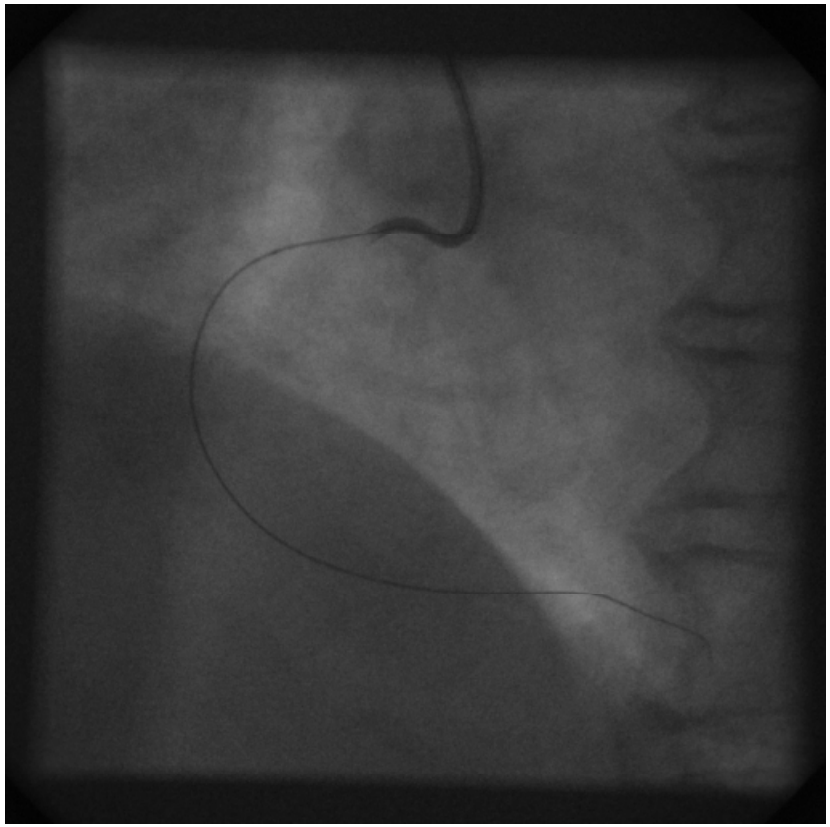




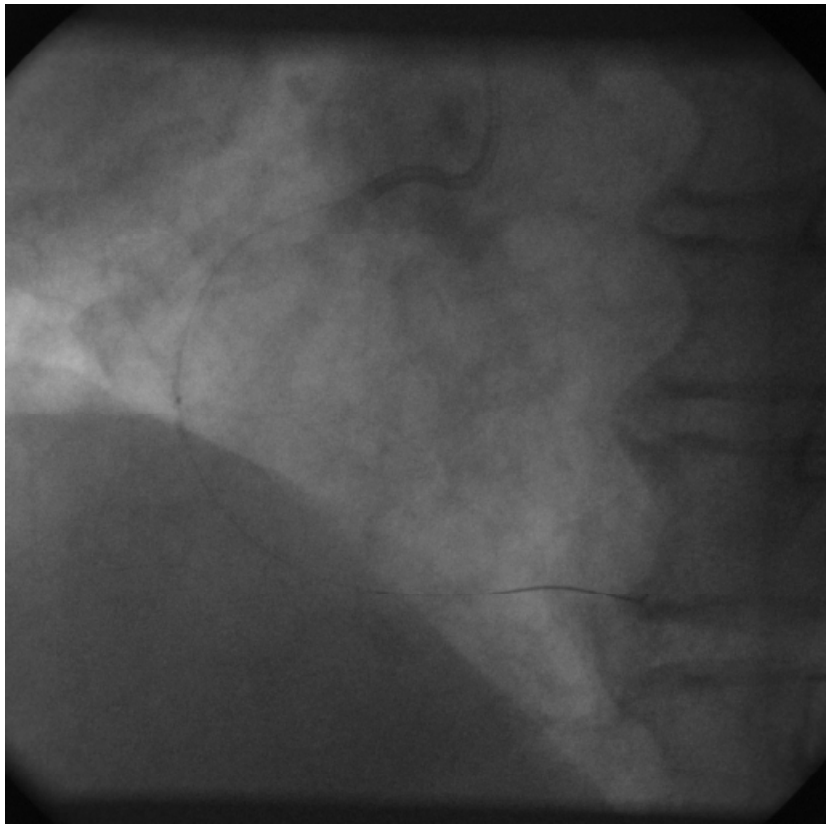
Guiding AL1 6F
Wire - Runthrough intermediate



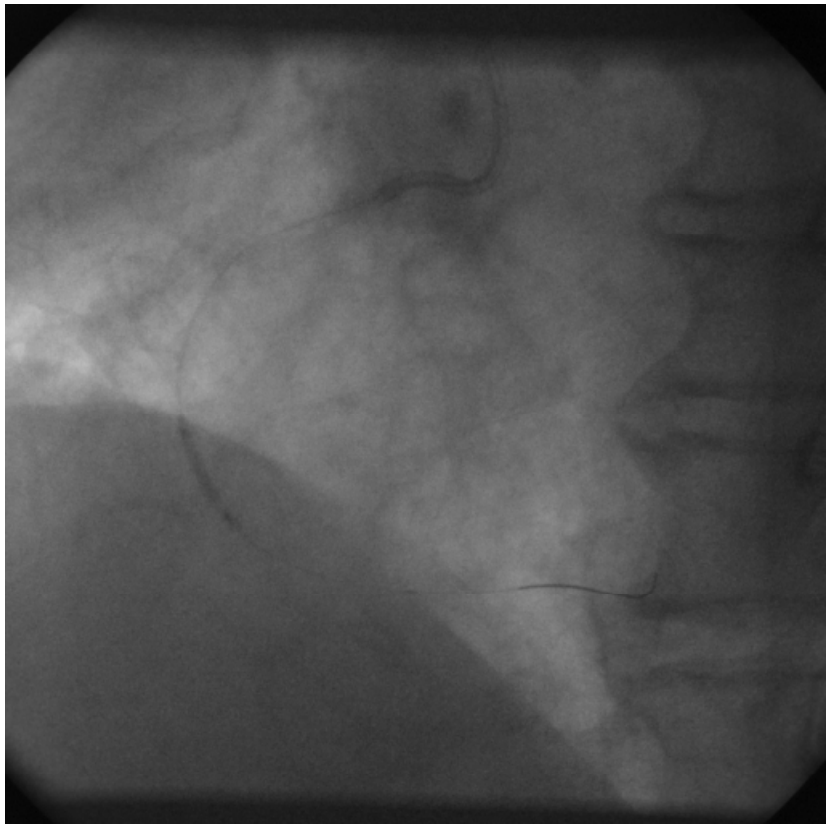
Wire - Conquest Pro

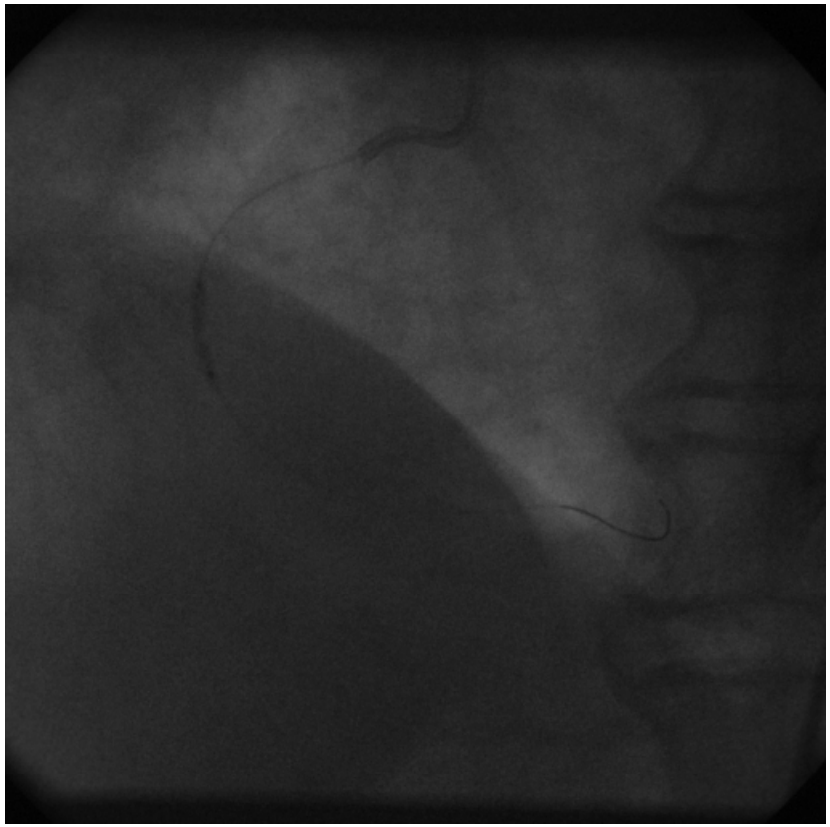


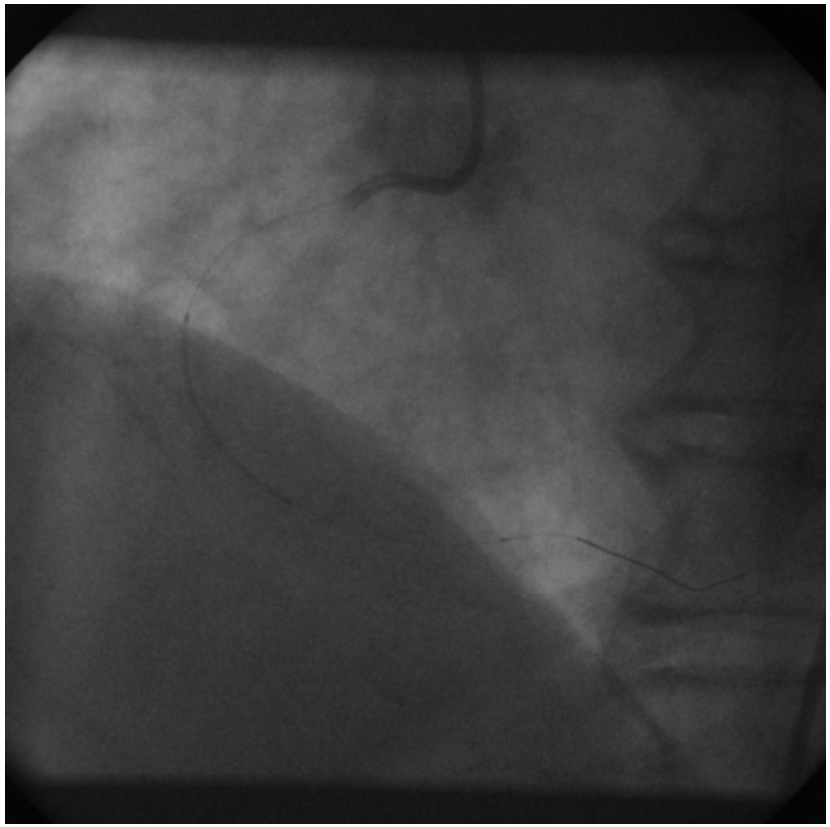
Ryujin Plus OTW 1.25 / 10 mm



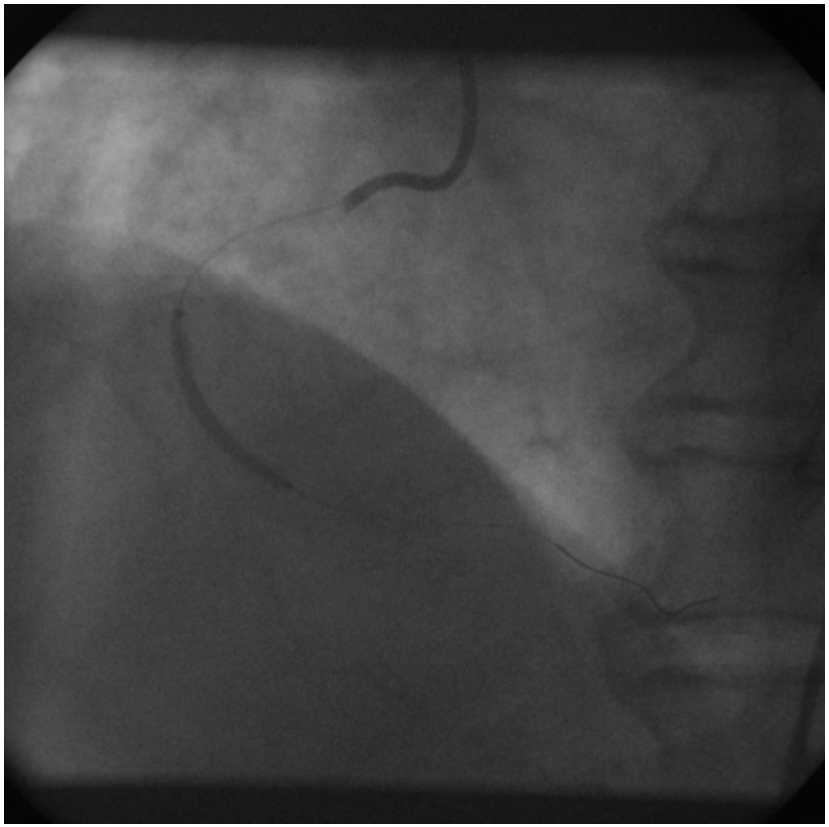
Wire exchanged with BMW

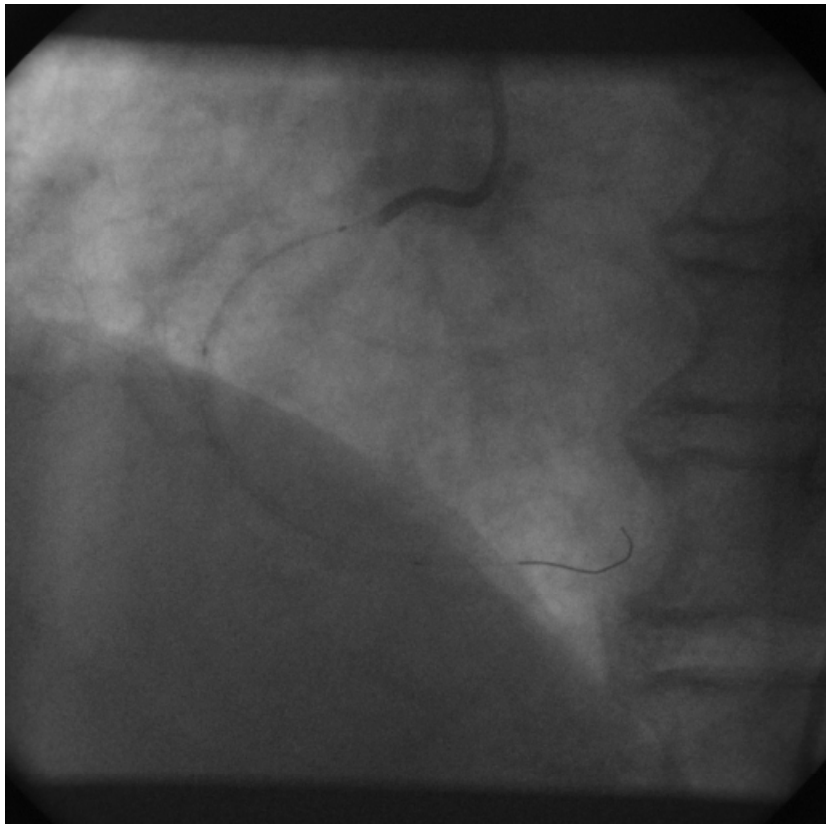




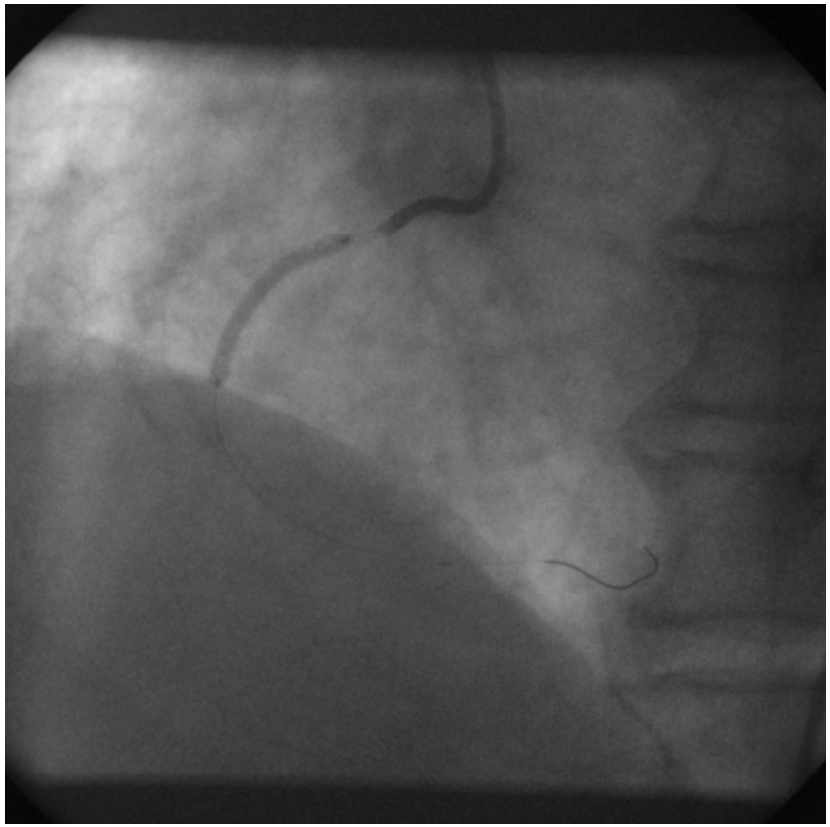


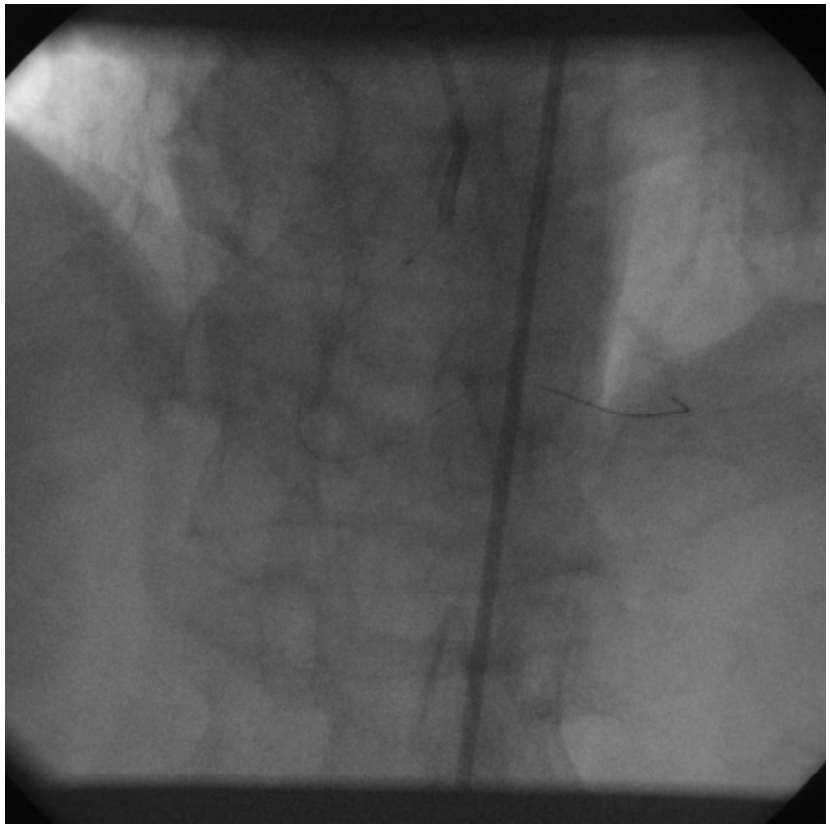
Stent – 2.25 / 32 mm

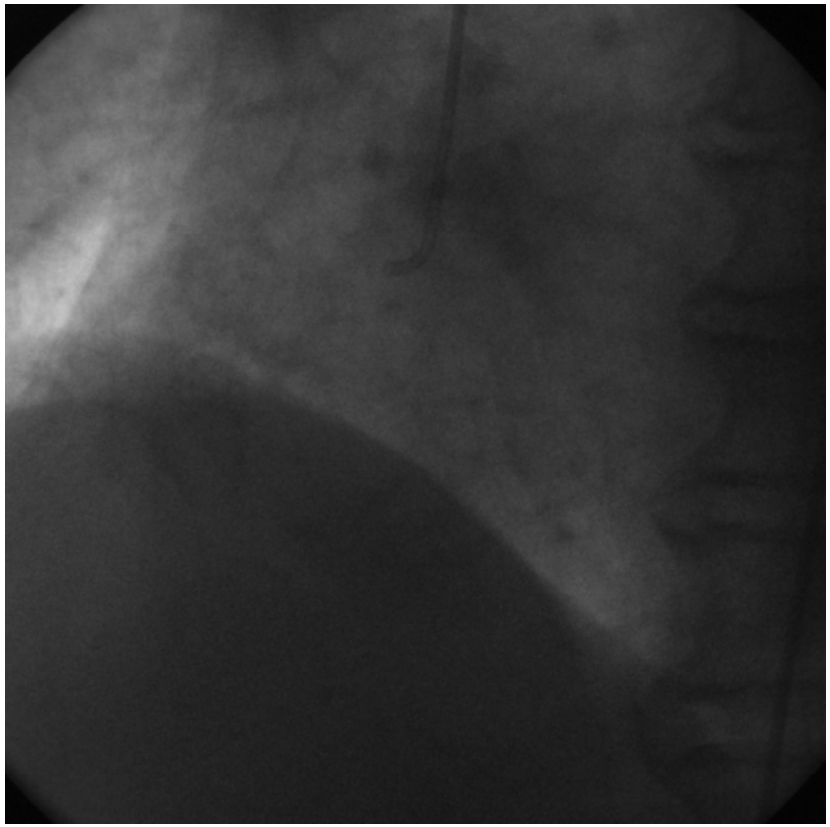


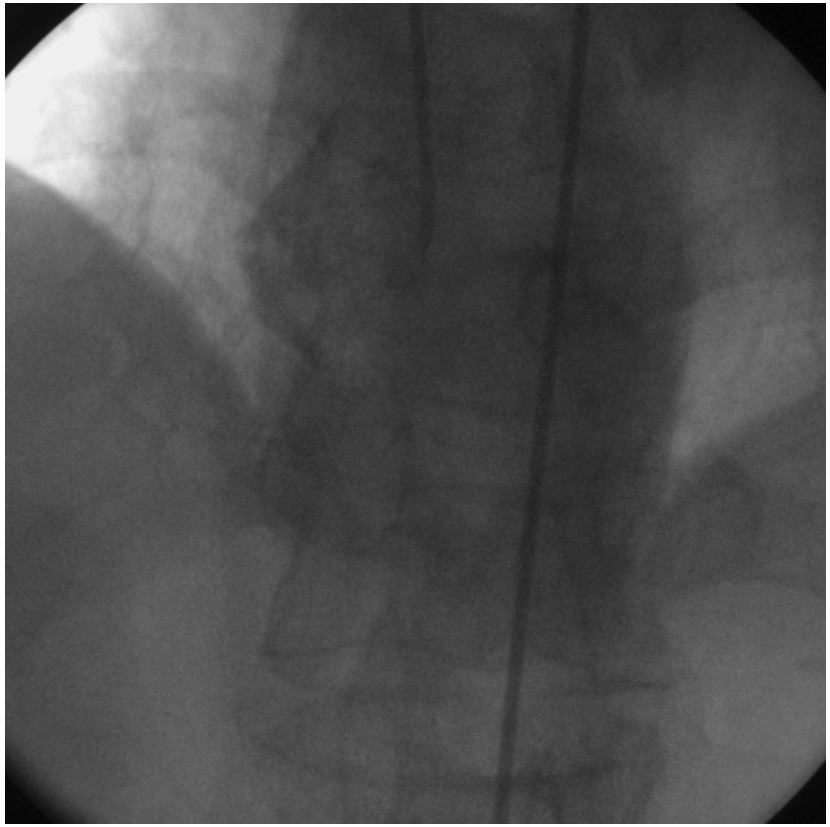


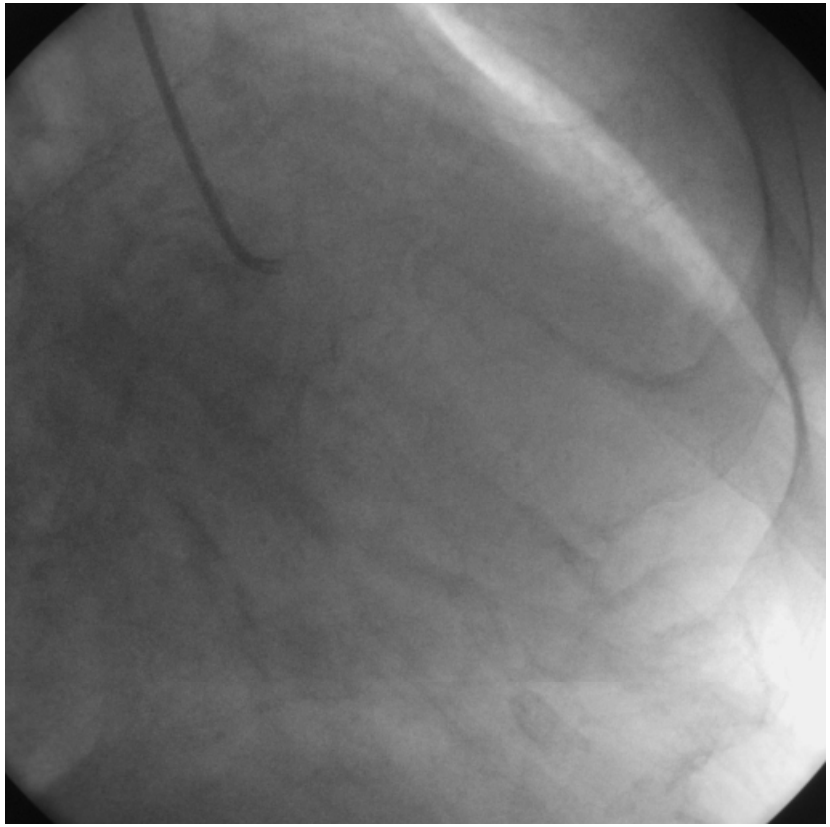
Stent - 2.5 x 28 mm











IJN Registry of CTO PCI: procedural, in hospital and 1 year outcome

2009 and 1 year follow up

Baseline patients characteristic

Age, (mean ± SD)	55.6 ± 10.6
Male, n (%)	134 (90.5)
Diabetes, n (%)	80 (54.1)
Hypertension	124 (83.8)
Dyslipidemia, n (%)	127 (85.8)
Family history of CAD, n (%)	42 (28.4)
Smoking, n (%)	13 (8.8)
CVD, n (%)	2 (1.4)
PAD, n (%)	3 (2)
Previous MI, n (%)	80 (54.1)
Previous PCI, n(%)	35 (23.6)
Previous CABG	7 (4.7)

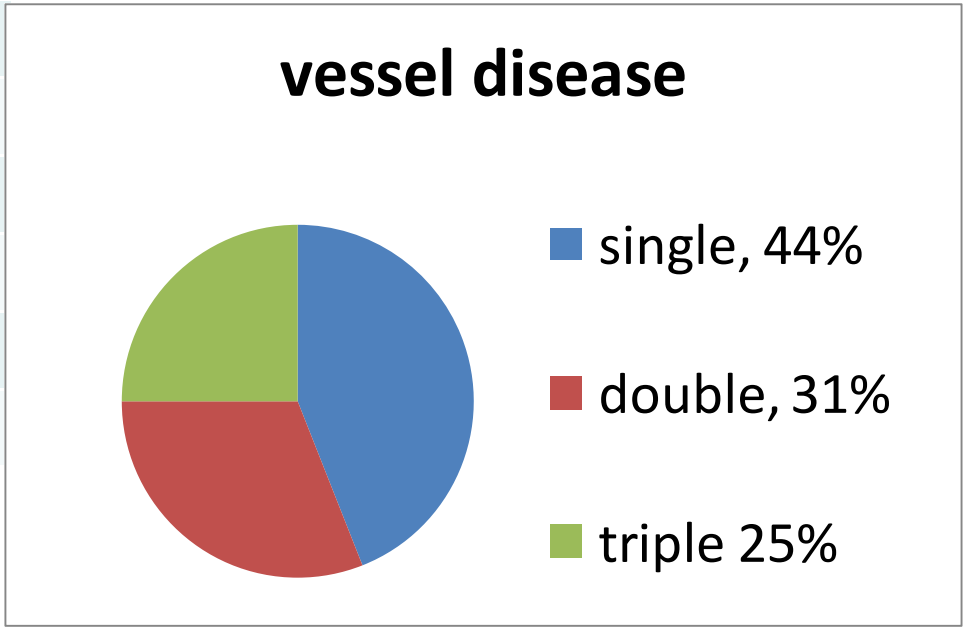
- 143 patients
- 148 CTO treated

PRESENTATIONS:

•ACS 2%,

•silent ischemia 6%,

•stable angina 92%

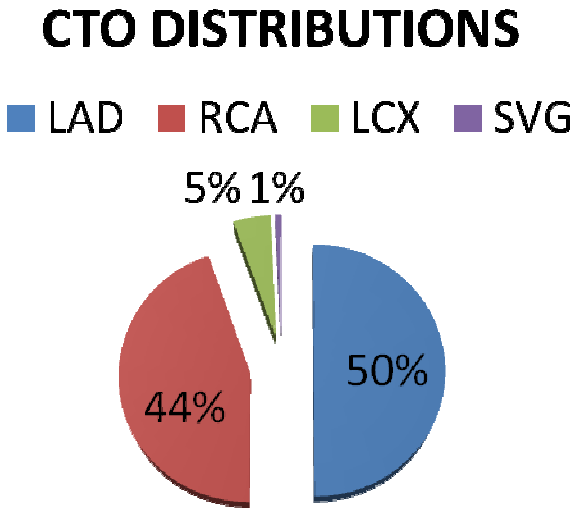


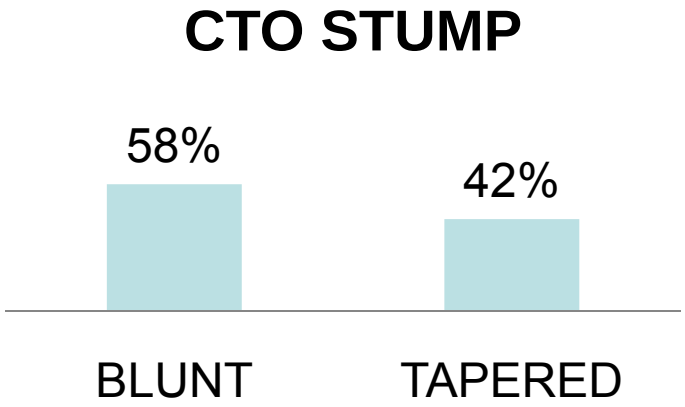
Clinical features

LV global EF	%
< 35%	7.8
35% ≤ and ≥ 50%	28
> 50%	64.2

ECG – CTO related	%
normal	64
Q wave	36

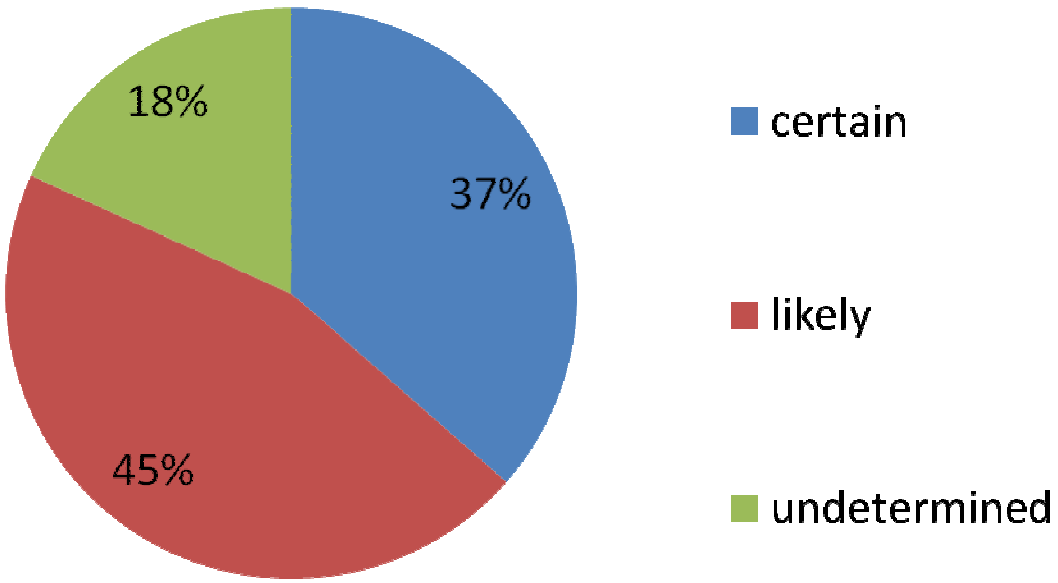
ANGIOGRAPHIC CHARACTERISTIC





CALCIFICATION	%
MILD	80
MODERATE	15
SEVERE	5

OCCLUSION DURATION



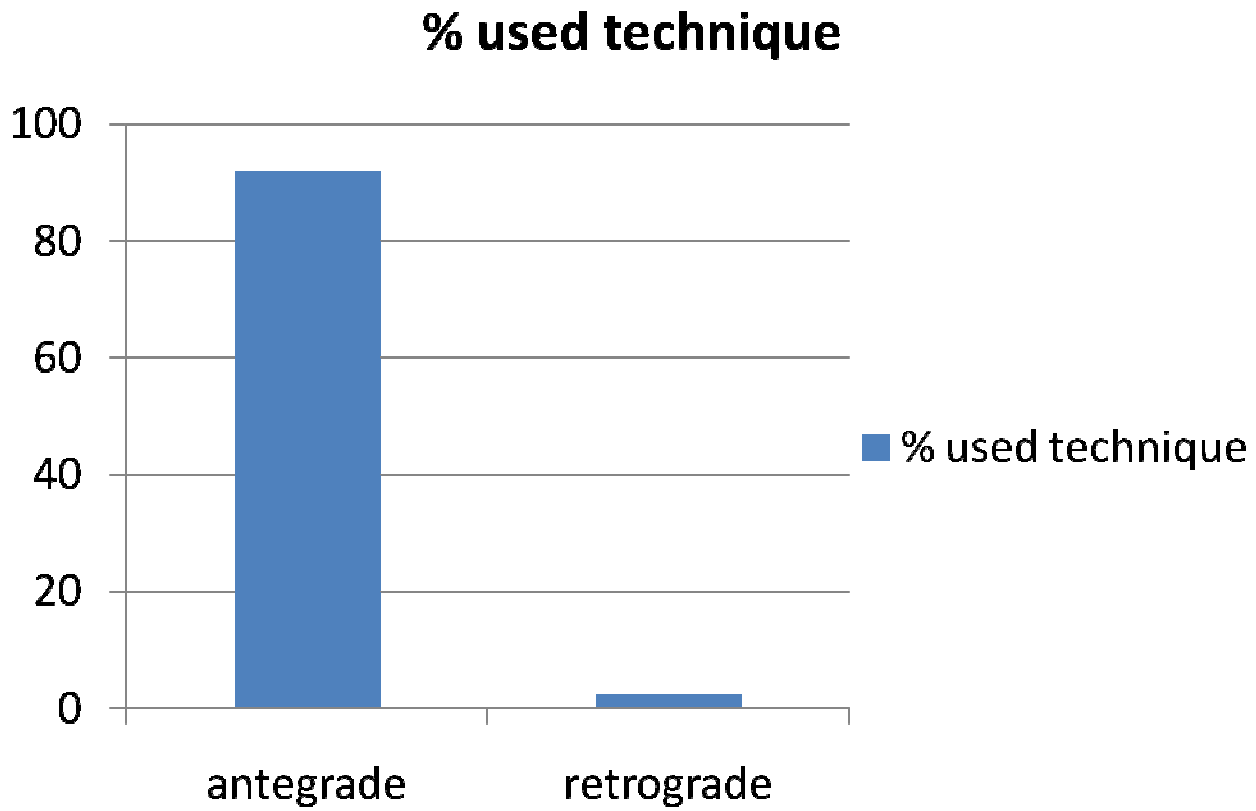
Mean ± SD → 21,3 ± 35.7 months

Median → 7 months

IQR → 4 – 17 months

CTO Treatment: Recanalization Approach

Procedural success: 102/148 = 68.9%



CTO Treatment: Recanalization Approach

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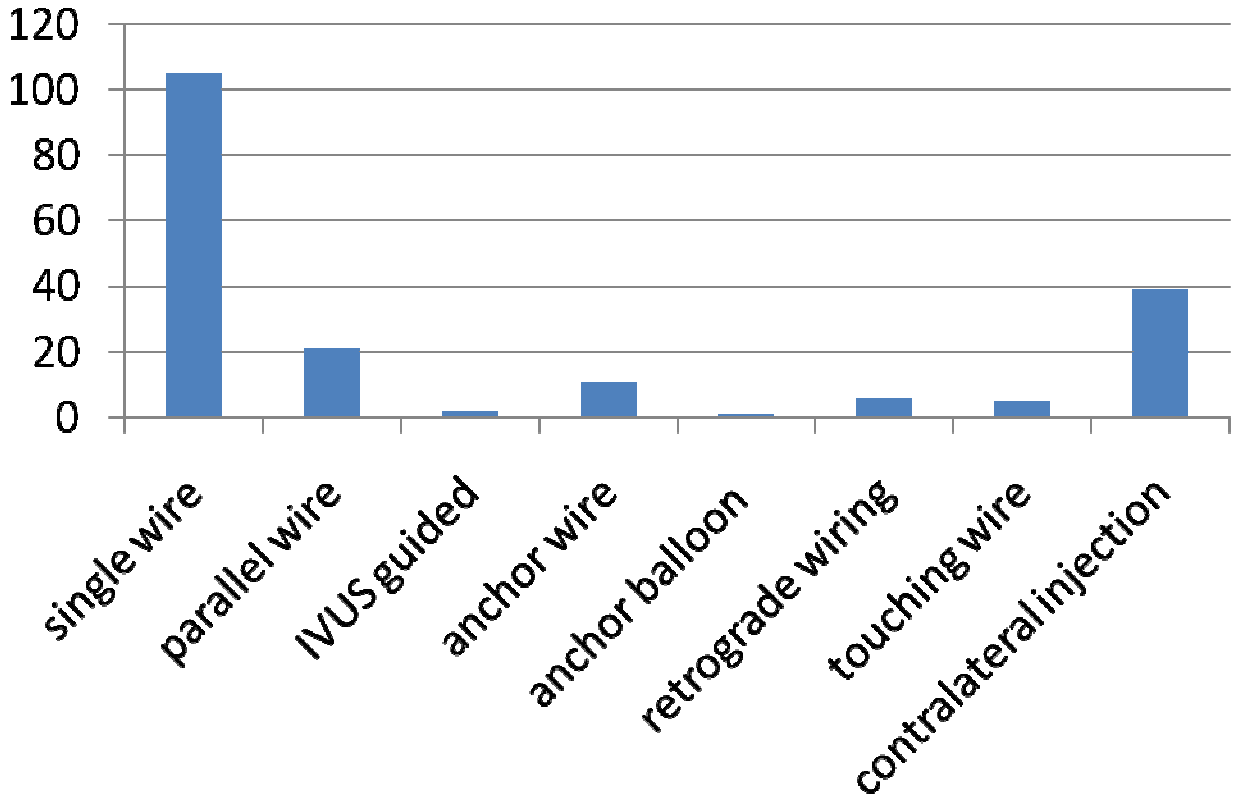


Treatment: guidewires used

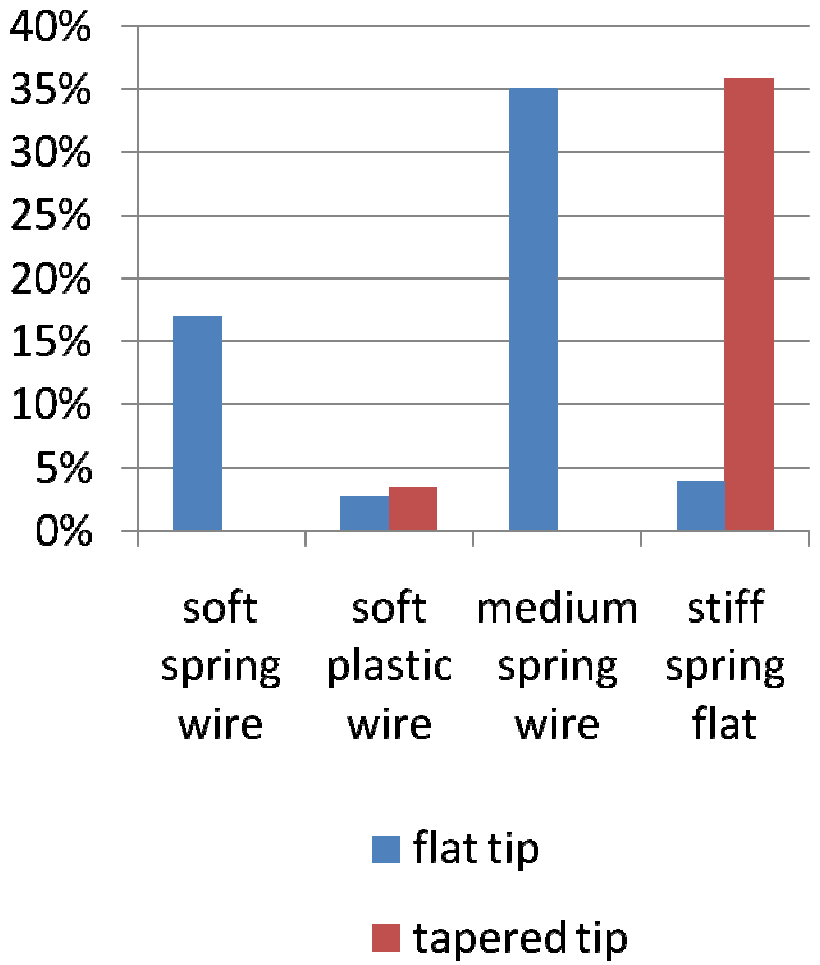
Characteristics of guidewire getting through acording to *Tip, Type and Stiffness*

Tip → tapered or flat
Type → plastic or spring
Stiffness → soft < 1g
intermediate ≤ 3g
moderate < 9g
hard ≥ 9g

Treatment: guidewires which crossed

Characteristics of guidewire getting through acording to
Tip, Type and Stiffness

Guidewires	
Soft spring	BMW, BMW universal, Runthrough
Soft plastic flat	Fielder FC, Whisper, PT Graphix
Soft plastic tapered	Fielder XT
Medium spring	Medium, Miracle 3, Coss-it 100
Medium plastic	Pilot series
Stiff spring flat	Miracle 4.5, 6 , 9, Persuader 6,
Stiff spring tapered	Confianza series, Cross-it 200, 300, 400, Persuader 9



Number of guidewires used

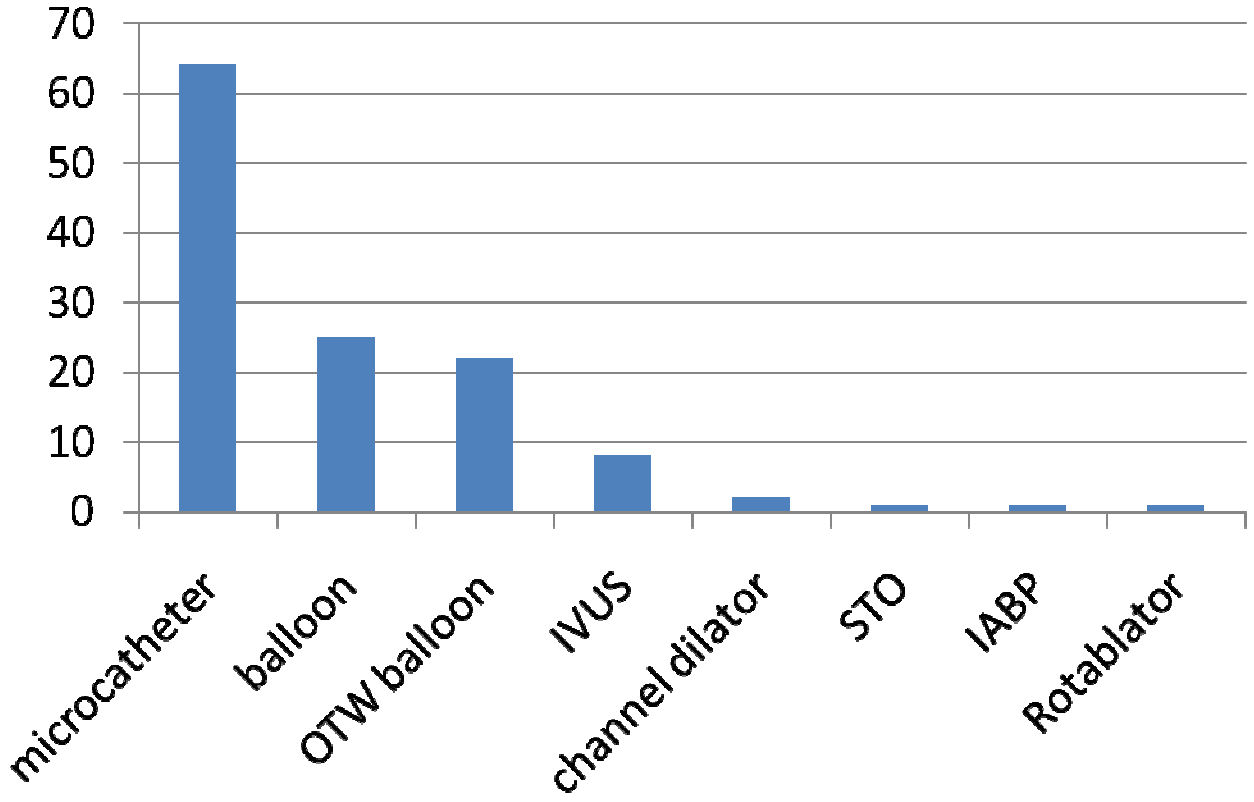
1 – 6 wires

Mean ± SD

1.9 ± 0.9

Median 2 wires

Devices used



Procedural data: stent used

Total successful procedures, n	102
DES, n (%)	86 (84.3%)
BMS, n (%)	8 (7.8%)
POBA/DEB, n (%)	8 (7.8%)
N of stents (mean ± SD)	225
Total stent length, mm (mean ± SD)	

Stents

	Mean ± SD	Min	Max
Lesion Length (mm)	34.9 ± 20.2	6	99
Stent Length (mm)	26.3 ± 7.6	8	39
Stent Diameter (mm)	2.9 ± 0.5	2	5

Procedural data

	Mean ± SD
Time of procedure (minute)	92.92 ± 48.09
Time of fluoroscopy (minute)	34.44 ± 19.70
Volume of contrast (cc)	221.82 ± 88.19

Procedural failure

	N = 46
Wire unable to cross, n (%)	44 (96)
Device unable to cross, n (%)	1(2)
Dissection of the Aortoiliac vessels, n (%)	1 (2)

Predictors of procedural failure

	Univariate predictors			Multivariate predictors		
	OR	95%CI	P	OR	95%CI	P
Blunt stump	0.97	0.46-2.02	0.935	1.27	0.56-2.86	0.570
CTO length > 20 mm	2.79	1.32-5.89	0.007	3.25	1.45-7.28	0.004
Severe calcifications	3.23	0.69-15.12	0.137	2.11	0.42-10.64	0.365
tortuosity	1.41	0.67-2.96	0.366	1.17	0.48-2.81	0.734
Bridging collateral	2.17	1.03-4.60	0.042	2.28	0.95-5.45	0.065

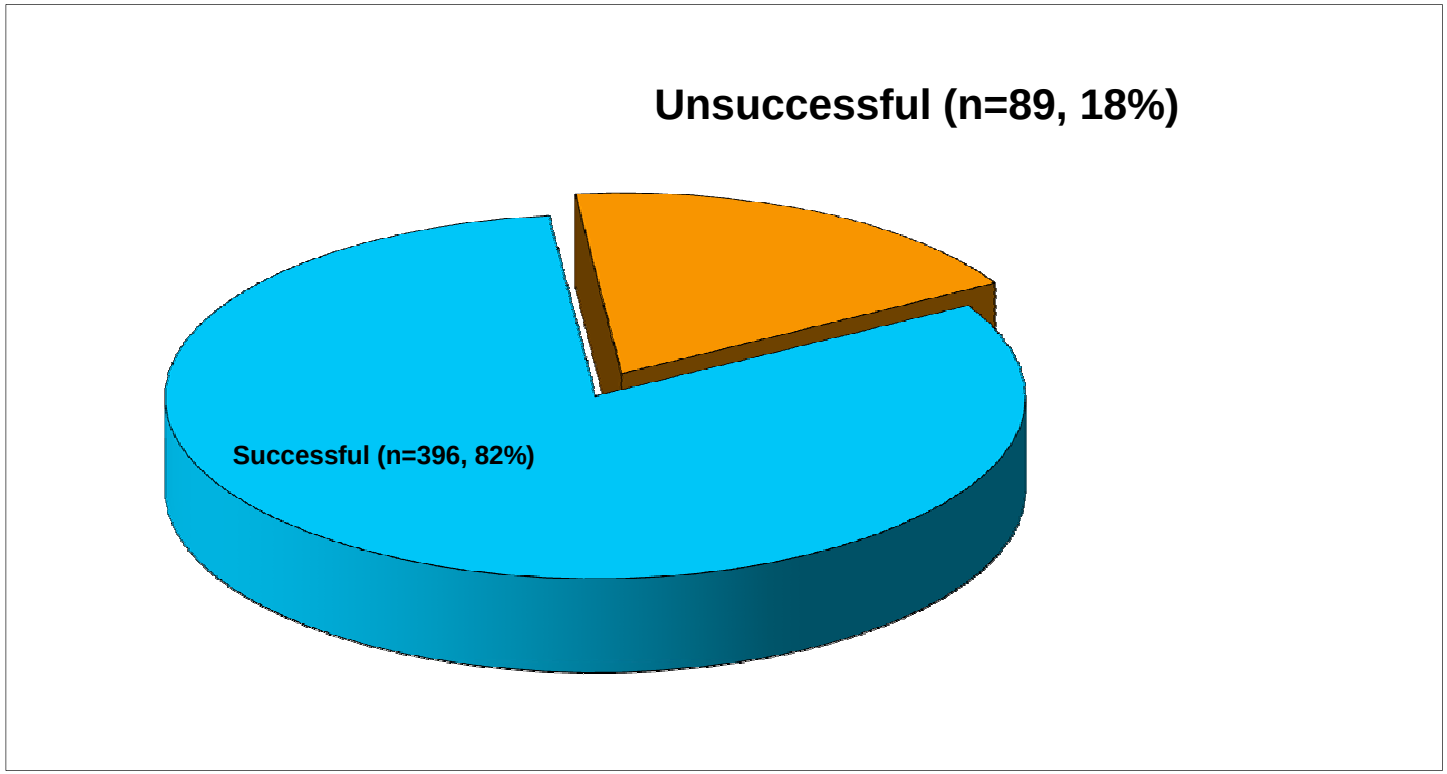
Complications

All procedures	In hospital N : 148	1 year
Procedural complication		
• coronary perforation, n (%)	7 (4.7)	
• cardiac tamponade, n (%)	1 (0.7)	
• emergent CABG, (%)	0	
outcome		
• death, (%)	0	0
• non Q myocardial infarction, (%)	0	2 (1.4)
• Q myocardial infarction, (%)	0	1 (0.7)
• stent thrombosis, (%)	0	0
• TLR	0	2 (1.4)
• Stroke, (%)	0	0

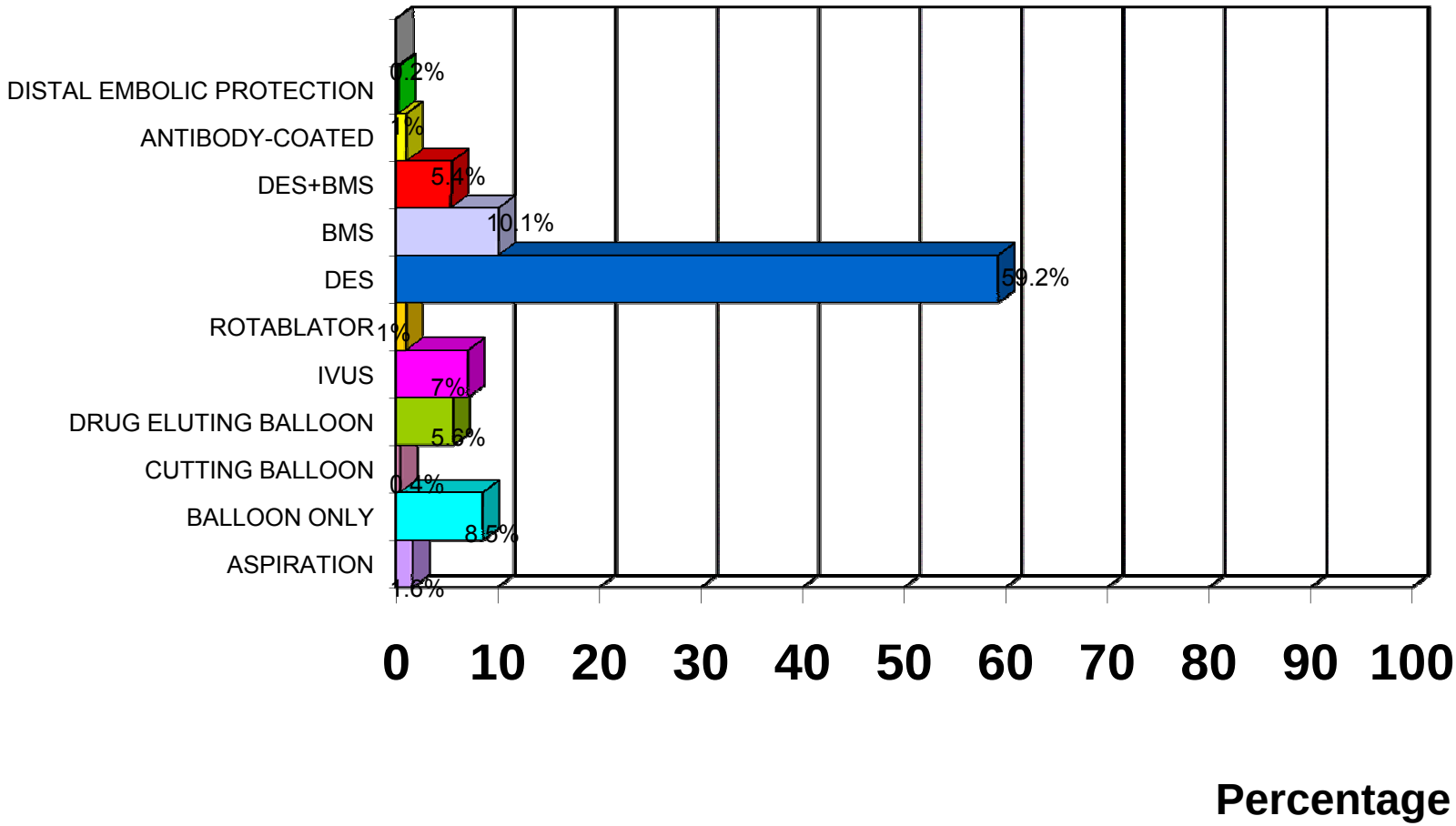

Thank you

Procedural Outcome

Total Patients = 485



Intracoronary Device used



In Hospital Outcome

	N	%
Emergency PCI	Nil	
Cardiogenic Shock	Nil	
Arrhythmia	4	0.8%
Post Rise Creatinine	6	1.2%
Bleeding at entry site	2	0.4%
GIT	Nil	
Pseudoaneurysm	Nil	
Death	0	

Outcome – 1 year (N=148)**

	N	%
Non-Q MI	2	1.4%
Q MI	1	0.7%
Stent thrombosis	Nil	
TLR	2	1.4%
Stroke	Nil	
Death	Nil	

** 2009

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