AsiaIntervention Journal Session – The Year in Intervention

Coronary Devices

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- **I have the following potential conflicts of interest to report:**
  - Scientific Advisor: Meril Life Sciences
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  - Member, BRS Global Advisory Board: Abbott Vascular

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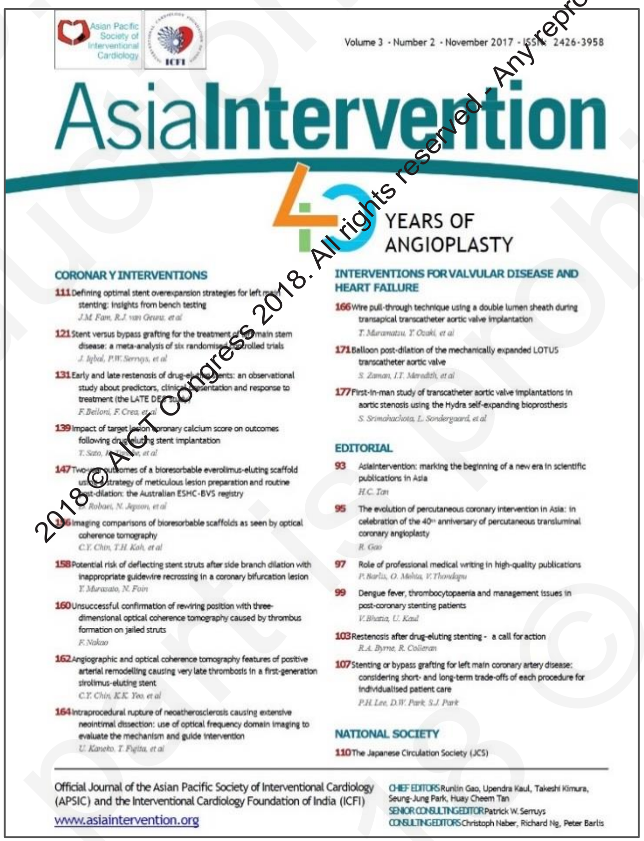
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Official Journal of the Asian Pacific Society of Interventional Cardiology (APSIC) and the Interventional Cardiology Foundation of India (ICFI)
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AsiaIntervention

HIGHLIGHTS

Takayasu's arteritis: a review of the literature and the role of endovascular treatment
Rachel Wenrui Lim et al – page 117

Takayasu's arteritis (TA), whose treatment options vary and are dependent on the stage and presentation of the disease, is a chronic non-specific vasculitis with variable presentation in different ethnicities and countries. Treatment options include medical therapy, endovascular intervention or surgical vascular reconstruction and, today, there are no clear guidelines regarding the choice between the endovascular and open surgical approaches. We aimed to review current literature related to TA, focusing on the role of endovascular treatment in revascularisation along with how the temporal course of the disease and stage at presentation influence the management of TA.

Retrograde algorithm for chronic total occlusion from the Asia Pacific Chronic Total Occlusion club
Eugene B. Wu et al – page 98

While retrograde CTO PCI is recognised as an effective method to improve success rates of CTO PCI, it remains a difficult technique for many interventionists. This article proposes a new retrograde CTO PCI algorithm by the Asia Pacific CTO club focusing on three specific problems in the retrograde approach. First, how to overcome the tough proximal cap. Second, how to cross the collateral channels safely and efficiently. Third, how to cross the CTO and, in particular, the problems of reverse CART. We explain our new philosophy of contemporary reverse CART and hope that this algorithm will provide the tools for operators to overcome the difficulties of retrograde CTO PCI.

Long-term clinical outcomes with biodegradable polymer sirolimus-eluting stents versus durable polymer sirolimus-eluting stents
Jaehoon Chung et al – page 77

This study tried to investigate why the CYPHER stent, one of the representative first-generation drug-eluting stents, finally failed, by comparing its durable polymer and biodegradable polymer both embedding sirolimus. The biodegradable polymer sirolimus-eluting stent, Orsiro, showed markedly improved clinical outcomes, for example in terms of clinically driven target lesion revascularisation and stent thrombosis within two years after coronary intervention. This difference was more apparent in the period from nine months to two years after index procedures. Therefore, we can conclude that late CYPHER failure resulted from its durable polymers, which means that sirolimus is still an effective antiproliferative agent for coronary drug-eluting stents.

Hospital outcomes in STEMI patients after the introduction of a regional STEMI network in the metropolitan area of a developing country
Surya Dharma et al – page 92

In contrast with the STEMI networks in developed countries, there are few data reporting the benefit of setting up STEMI networks in developing countries, particularly in Asia. We compared the characteristics and outcomes of patients with STEMI seen during two time periods in a primary percutaneous coronary intervention (PCI) centre that implemented a regional STEMI network in 2010 (Jakarta Cardiovascular Care Unit Network System). Half a decade after the implementation of the STEMI network in Jakarta, Indonesia, the result is better and faster care for patients with STEMI and this has been associated with lower in-hospital mortality.

1

AsiaIntervention September 2018

Bench testing for left main overexpansion

AsiaIntervention 2017;3:111-120

EXPERIMENTAL RESEARCH
CORONARY INTERVENTIONS

Defining optimal stent overexpansion strategies for left main stenting: insights from bench testing

Jiang Ming Fam[1,2]*, MBBS; Peter Mortier[3,4], PhD; Matthieu De Beule[3,4], MS, PhD; Tim Dezutter[3,4], MS; Nicolas Van Mieghem[1], MD, PhD; Roberto Diletti[1], MD, PhD; Bert Everaert[1,5], MD, PhD; Soo Teik Lim[2], MBBS; Felix Zijlstra[1], MD, PhD; Robert-Jan van Geuns[1], MD, PhD

1. Thoraxcenter, Erasmus University Medical Center, Rot Singapore; 3. IBiTech-bioMMeda, iMinds Medical IT, Gh 5. AZ Monica Hospital, Antwerp, Belgium

This paper also includes supplementary data published online a

- Tested stents beyond expansion limits with POTand FKBD
- Deployed 4mm cobalt chromium stent in 6 mm phantom model
- Dialated with SC and NC bslloons at graded pressures

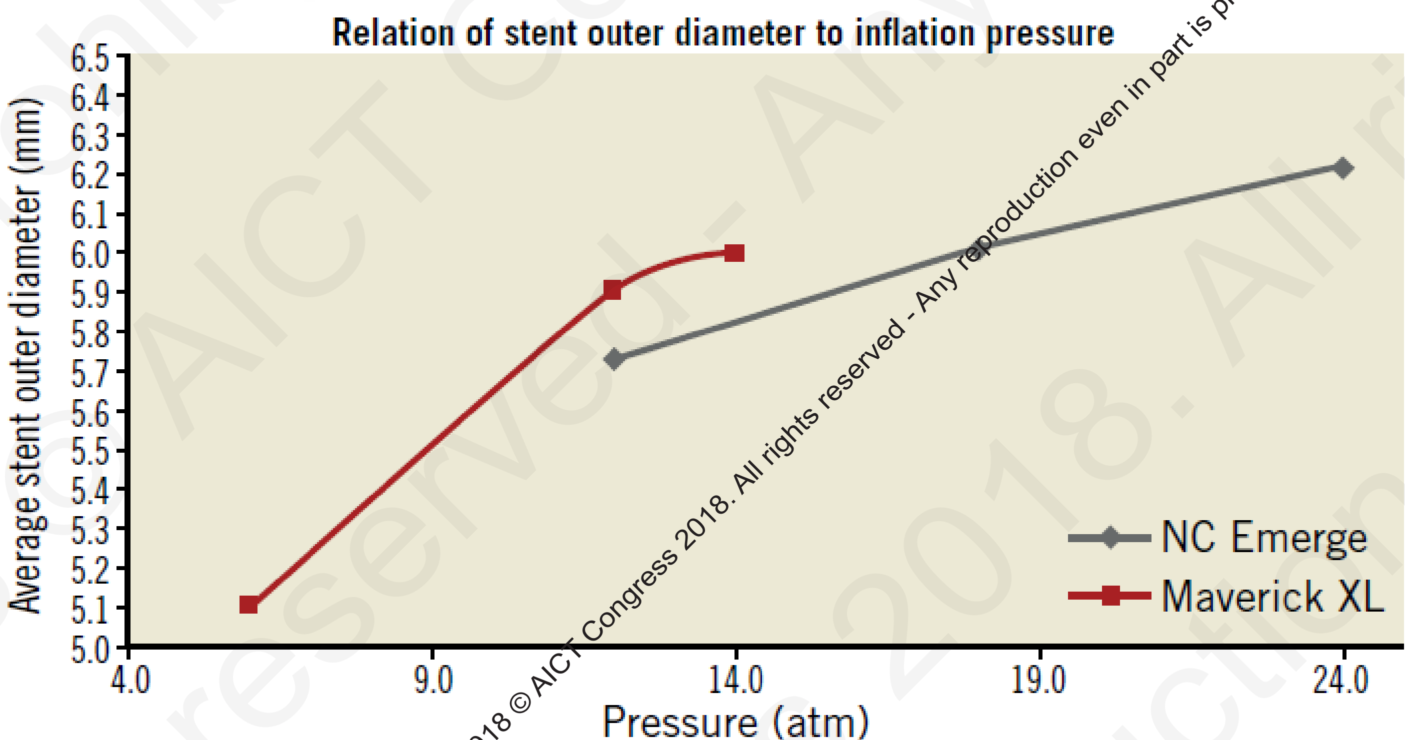

Figure 3. ***The relation of the change in stent diameter***

Bench testing for left main overexpansion

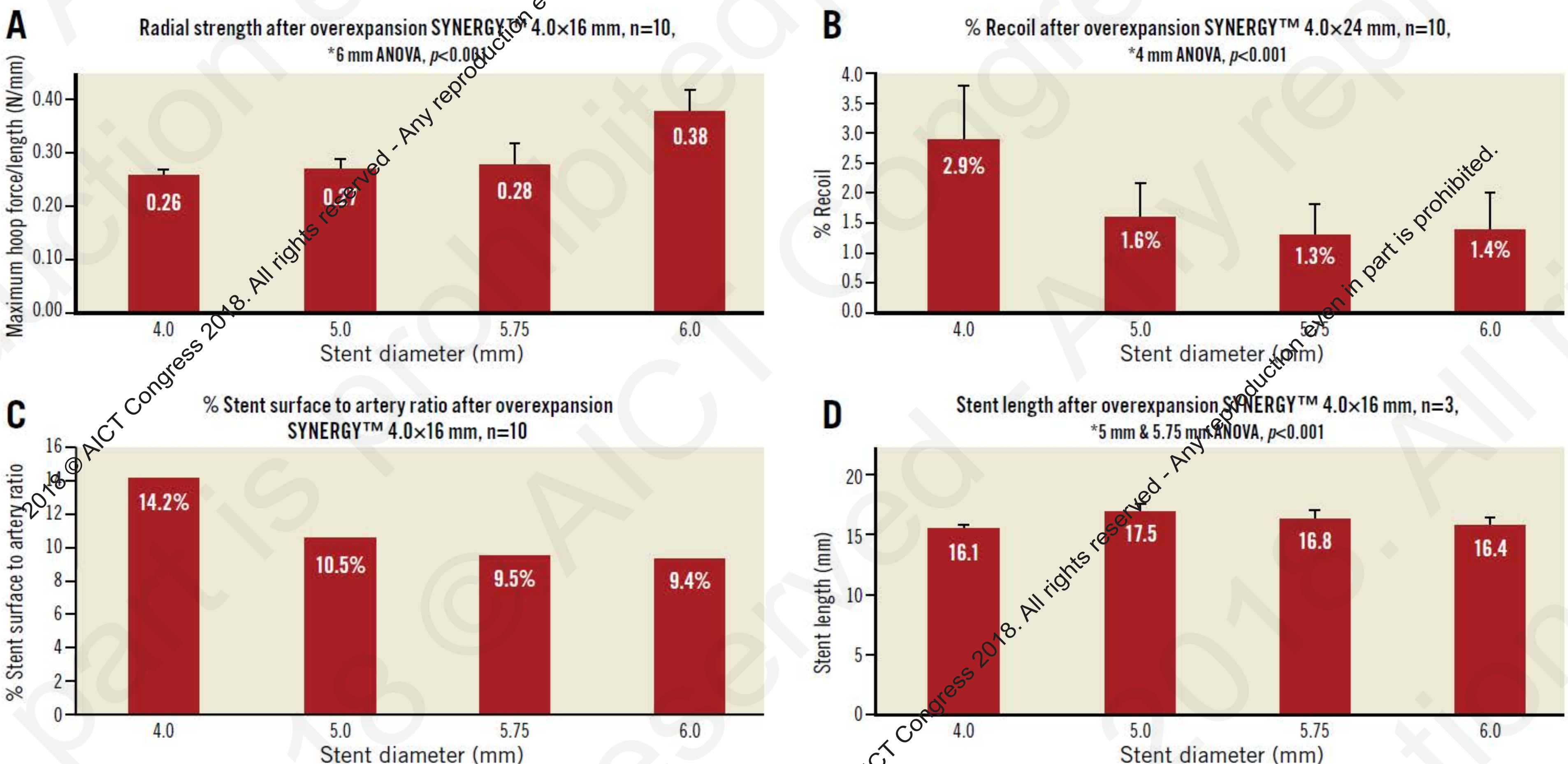

Figure 4. *Impact of overexpansion on stent mechanical performance*

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Bench testing for left main overexpansion

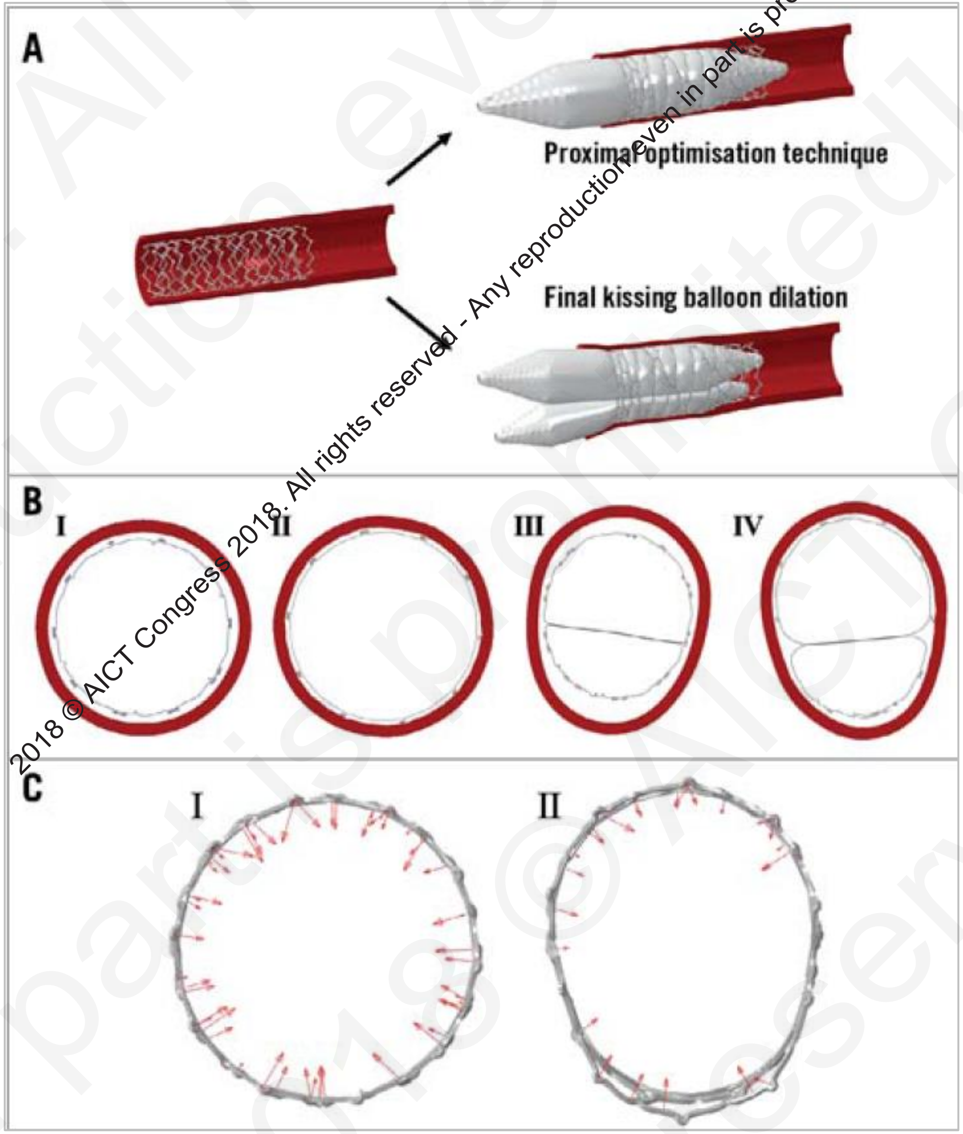

Figure 5. *Computer simulations of the stenting procedures*

Conclusion

- POT but not FKBDcan expand platinum chromium 4 mm stent to beyond 5.75mm with optimal apposition and performance .
- Platinum Chromium stents maintain their mechanical chracteristics at these diameters
- Thus for LM PCI which is sometimes 6 mm , NC balloons of Full size at full pressure ie. 16 atmos are necessary for POT to achieve full predicted diam and avoid malapposition

ESHC-BVS registry two-year outcomes

AsiaIntervention 2017;3:147-155

EXPERIMENTAL RESEARCH
CORONARY INTERVENTIONS

Two-year outcomes of a bioresorbable everolimus-eluting scaffold using a strategy of meticulous lesion preparation and routine post-dilation: the Australian ESHC-BVS registry

Daniel Robaei[1,2,3], MBBS; Liam Back[1], MBBS; Elizabeth Russell[1,3], RN; Sze-Yuan Ooi[1,3], MD; Mark Pitney[1,2,3], MBBS; Nigel Jepson[1,3*], MBBS

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Table 2. Procedural and device data.

Lesion preparation	
Predilation, %	100
Rotational atherectomy, %	2.0
Scoring balloon, %	1.3
Procedural anticoagulation	
Unfractionated heparin, %	80.1
Bivalirudin, %	19.9
Tirofiban, %	8.3
Intracoronary imaging	
Intravascular ultrasound, %	6.5
Optical coherence tomography, %	9.3
Scaffold no. and size	
Mean no. of scaffolds per patient	1.67±0.94
Scaffold overlap, % lesions treated	18
Mean scaffold length, mm	22.74
Mean scaffold diameter, mm	2.98
2.5×18 mm	13.2%
2.5×28 mm	16.8%
3.0×18 mm	23.4%
3.0×28 mm	21.0%
3.5×12 mm	1.8%
3.5×18 mm	13.2%
3.5×28 mm	10.8%
Deployment and post-dilation	
Mean deployment pressure, atm	13.9±1.6
Post-dilation, %	95
Non-compliant post-dilation balloon, %	100
Mean post-dilation pressure, atm	19.6±4.6
Post-dilation balloon diameter	
Equal to scaffold, %	33
0.25 mm > than scaffold, %	45
0.5 mm > than scaffold, %	21

ESHC-BVS registry two-year outcomes

Table 3. Clinical outcomes.

	30-day (%)	6-month (%)	12-month (%)	24-month (%)
Death (all-cause)	0	0	0	3
Cardiac death	0	0	0	1
Myocardial infarction (type 1)	0	2	2	2
STE-ACS	0	1	1	1
NSTE-ACS	0	1	1	1
Scaffold thrombosis* (any)	0	1	1	2
Definite/probable	0	1	1	1
Possible	0	0	0	1
In-scaffold restenosis	0	1	2	2
TLR	0	2	4	4
PCI	0	1	2	2
CABG	0	1	2	2
Non-TLR	0	2	2	2
MACE**	4	7	8	9

*Definite/probable/possible stent thrombosis by ARC criteria.
**Composite of cardiac death, target lesion revascularisation, and myocardial infarction (including periprocedural myocardial infarction).

ESHC-BVS registry two-year outcomes

Table 5. Predictors of clinical events.

	Target lesion revascularisation (%)	Myocardial infarction (type 1) (%)	Scaffold thrombosis (definite/probable) (%)	In-scaffold restenosis (%)	Cardiac death (%)
OCT/IVUS guidance	0	0	0	0	3.8
No OCT/IVUS guidance	3.2	1.6	0.8	1.6	0
Relative risk (95% CI)	0.52 (0.03-9.42)	0.94 (0.05-19.04)	1.57 (0.07-37.46)	0.94 (0.05-19.04)	14.11 (0.59-337.16)
p-value	0.660	0.968	0.781	0.968	0.102
Scaffold diameter 2.5 mm	0	0	0	0	0
Scaffold diameter ≥3.0 mm	3.4	1.7	0.8	1.7	0.8
Relative risk (95% CI)	0.26 (0.01-4.69)	0.46 (0.02-9.47)	0.77 (0.03-18.62)	0.46 (0.02-9.47)	0.77 (0.03-18.62)
p-value	0.359	0.617	0.873	0.617	0.873
Lesion length ≥28 mm	6.8	3.4	3.4	0	3.4
Lesion length <28 mm	1.6	0.8	0	0.8	0
Relative risk (95% CI)	4.24 (0.62-28.87)	4.24 (0.27-65.83)	12.40 (0.52-296.91)	1.38 (0.06-32.99)	12.40 (0.52-296.91)
p-value	0.140	0.302	0.120	0.843	0.120
Scaffold overlap	3.7	3.7	3.7	0	3.7
No scaffold overlap	2.4	0.8	0	1.6	0
Relative risk (95% CI)	1.54 (0.17-14.28)	4.63 (0.30-71.73)	13.50 (0.56-322.81)	0.90 (0.44-18.23)	13.50 (0.56-322.81)
p-value	0.702	0.273	0.108	0.945	0.108

Conclusion

- GOOD outcomes achieved at 2 years ABSORB BVS real worl prospective registry utilizing dedicated implantation technique but low rates of imaging.
- Supports the previous publications and that all future evaluations of bioabsorbable technologies should employ the dedicated implant technique

Clinical impact of IVUS-guided PCI in the DES era

AsiaIntervention 2018;4:26-33

CLINICAL RESEARCH
CORONARY INTERVENTIONS

Intravascular ultrasound-guided versus angiography-guided percutaneous coronary intervention with drug-eluting stents: five-year outcomes from the CREDO-Kyoto PCI/CABG registry

Hiroki Watanabe[1], MD; Takeshi Morimoto[2], MD; Hiroki
Yoshihisa Nakagawa[4], MD; Kenji Ando[5], MD; Kazushige
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This paper also includes supplementary data published online at: www.asiaintervention.org

Efficacy and Utility of IVUS guided PCI demonstrated in BMS era but uncertain in DES era…

Prospective MC Registry, Japan
26 centres , 3 Yrs 2005-2007

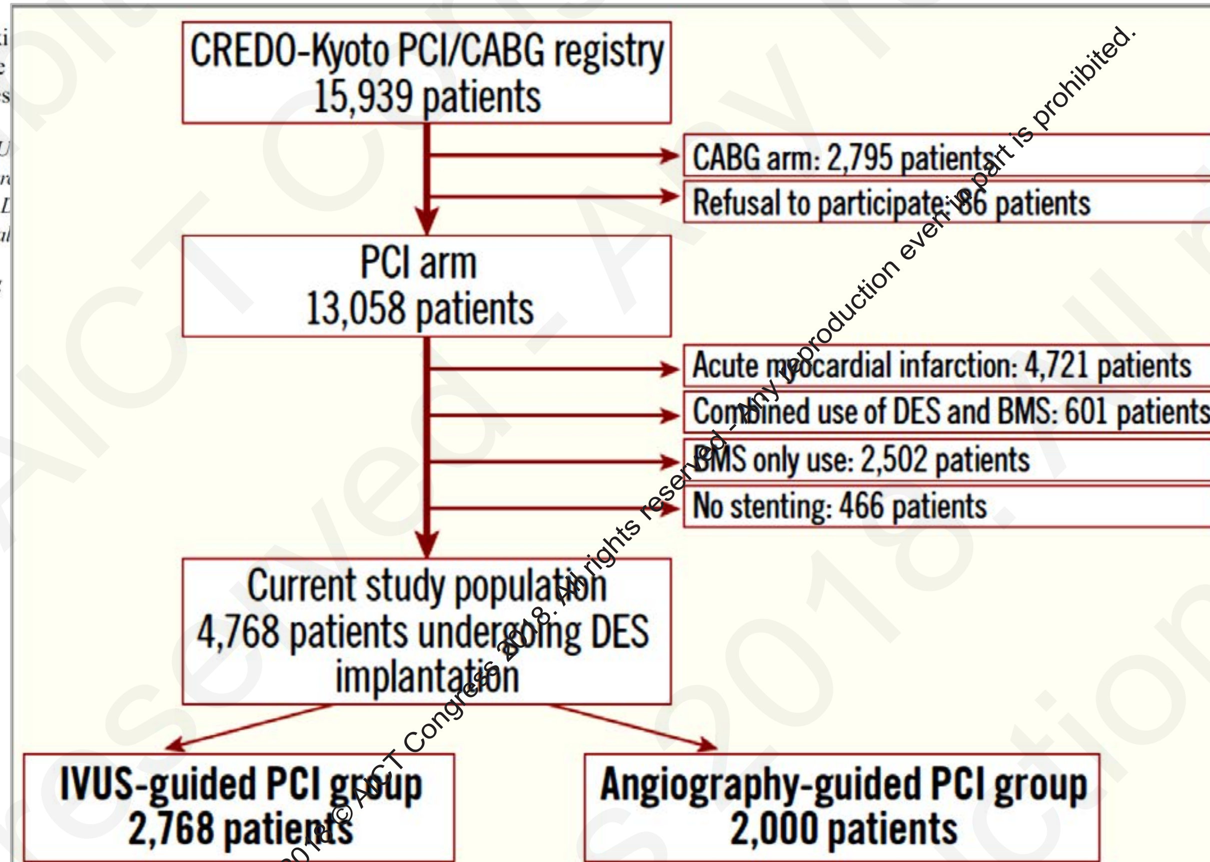
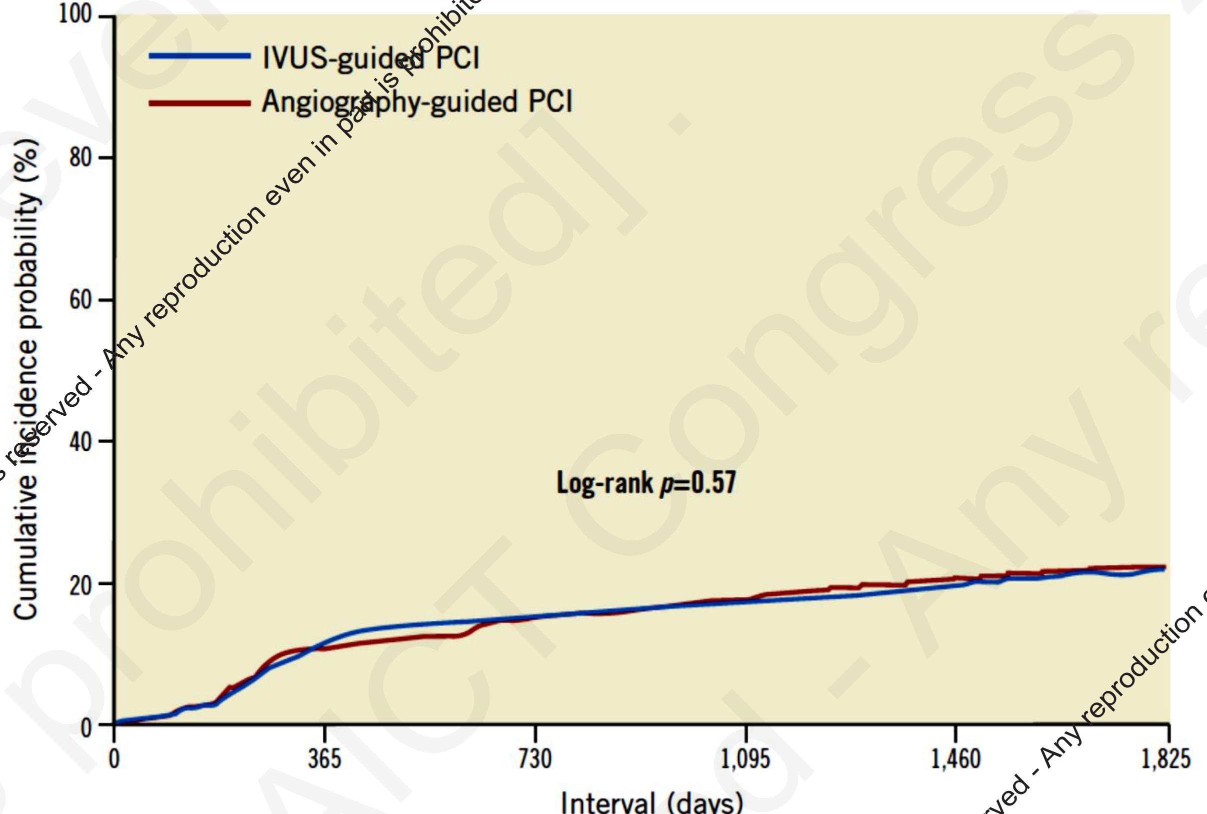


Figure 1. ***Study Flow Chart***

Clinical impact (TVR) of IVUS-guided PCI in the DES era



Interval	0 day	1 year	3 years	5 years
IVUS-guided group				
No. of patients with at least one event		307	455	556
No. of patients at risk	2,768	2,375	2,051	1,198
Cumulative incidence probability		11.3%	17.0%	21.5%
Angio-guided group				
No. of patients with at least one event		205	334	408
No. of patients at risk	2,000	1,707	1,459	857
Cumulative incidence probability		10.6%	17.6%	22.2%

Figure 3. *Kaplan-Meier curve for the crude cumulative incidence of target vessel revascularization in the IVUS group and the angio group*

Clinical impact of IVUS-guided PCI in the DES era

Variable	IVUS group No. of patients with TVR (Cumulative incidence) N=2,768	Angiography group No. of patients with TVR (Cumulative incidence) N=2,000	Crude HR (95% CI)	Log-rank p	Adjusted HR (95% CI)	p-value	Interaction p
Diabetes	291 (27.3%)	208 (26.7%)	1.04 (0.88-1.24)	0.65	0.92 (0.83-1.03)	0.14	0.35
Non-diabetes	265 (17.5%)	200 (18.9%)	0.90 (0.75-1.07)	0.23	0.91 (0.76-1.09)	0.31	
Total stent length							
>28 mm	406 (27.5%)	271 (27.9%)	0.99 (0.85-1.15)	0.88	1.04 (0.89-1.21)	0.66	0.14
≤28 mm	150 (13.7%)	137 (15.9%)	0.83 (0.67-1.04)	0.11	0.89 (0.71-1.12)	0.31	
Minimal stent diameter							
<3 mm	351 (26.3%)	273 (27.5%)	0.96 (0.53-1.12)	0.61	0.93 (0.80-1.10)	0.41	<0.0001
≥3 mm	205 (16.5%)	135 (16.1%)	1.01 (0.82-1.25)	0.93	1.07 (0.86-1.32)	0.55	
Multivessel disease	420 (27.0%)	291 (27.0%)	1.00 (0.87-1.16)	0.97	1.02 (0.88-1.19)	0.76	0.13
Single-vessel disease	136 (13.3%)	117 (15.4%)	0.85 (0.67-1.07)	0.169	0.84 (0.66-1.08)	0.18	
IVUS use per centres							
Frequent use (>70%)	470 (21.3%)	33 (16.8%)	1.23 (0.90-1.74)	0.22	1.15 (0.82-1.61)	0.42	0.36
Non-frequent use (≤70%)	86 (22.7%)	375 (22.8%)	1.02 (0.81-1.28)	0.84	1.03 (0.81-1.30)	0.81	

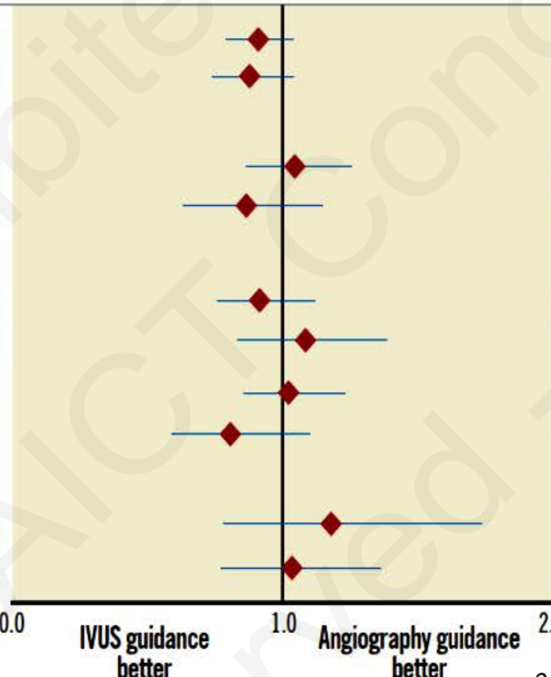


Figure 4. ***Subgroup analyses and forest plots of hazard ratio for target vessel revascularization***

Clinical impact of IVUS-guided PCI in the DES era

AsiaIntervention 2018;4:26-33

CLINICAL RESEARCH
CORONARY INTERVENTIONS

Intravascular ultrasound-guided versus angiography-guided percutaneous coronary intervention with drug-eluting stents: five-year outcomes from the CREDO-Kyoto PCI/CABG registry

Hiroki Watanabe[1], MD; Takeshi Morimoto[2], MD; Hiroki Shiomi[1], MD; Yutaka Furukawa[3], MD; Yoshihisa Nakagawa[4], MD; Kenji Ando[5], MD; Kazushige Kadota[6], MD; Takeshi Kimura[1]*, MD; on behalf of the CREDO-Kyoto PCI/CABG registry investigators

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This paper also includes supplementary data published online at: www.asiaintervention.org

Conclusion

LIMITATIONS : no clear criteria for IVUS guidance, Action on IVUS findins left to operator, Retrospective analysis, No IVUS data or angio data centrally analysed

BUT

Large REGISTRY of REAL WORLD PRACTICE and Outcomes

IVUS guided PCI achieved neutral results compared to Angio guided PCI in pts having De novo procedures with first Gen DES

Sirolimus is innocent

AsiaIntervention 2018;4:77-86
CLINICAL RESEARCH
CORONARY INTERVENTIONS

Long-term clinical outcomes with biodegradable polymer sirolimus-eluting stents versus durable polymer sirolimus-eluting stents

Jaehoon Chung[1,2], MD; Woo-Hyun Kim[1], MD; Hack-Lyoung Kim[1], MD; Jae-Bin Seo[1], MD; Woo-Young Chung[1]*, MD

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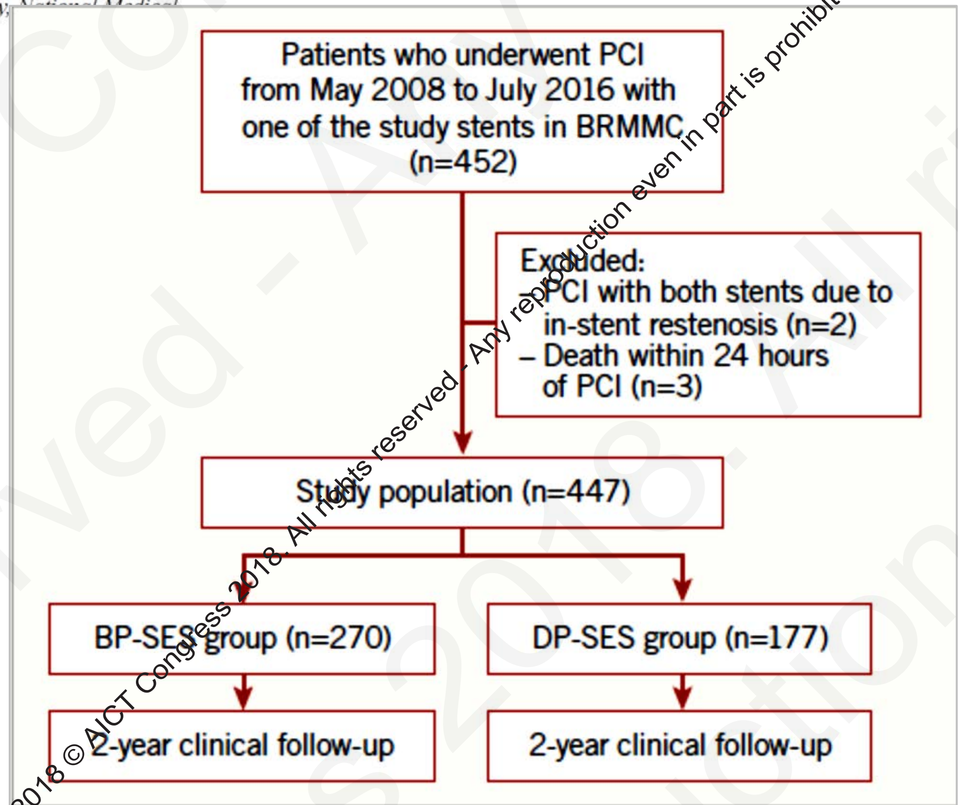

Figure 1. *Flow chart of the study groups*

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Table 4. Adjusted hazard ratios of clinical outcomes in multivariable model.

Variables	Adjusted HR*	95% CI	*p*-value
Cardiac death, stent thrombosis or clinically driven TLR (primary endpoint)	0.37	0.14-0.87	0.022
Cardiac death	2.13	0.25-26.66	0.484
Stent thrombosis	0.07	0.00-0.65	0.015
Clinically driven TLR	0.26	0.09-0.69	0.006
Stent thrombosis or clinically driven TLR	0.26	0.09-0.69	0.006
Cardiac death, stent thrombosis or clinically driven TLR after 9 months	0.34	0.10-0.97	0.043
Stent thrombosis or clinically driven TLR after 9 months	0.23	0.06-0.74	0.012

Hazard ratio provided as hazard BP-SES/hazard DP-SES. *adjusted for previous myocardial infarction, clinical diagnosis, total stent length, minimal stent diameter, severe lesion calcification, and left ventricular ejection fraction. CI: confidence interval; HR: hazard ratio; TLR: target lesion revascularisation

Sirolimus is innocent

Subgroup		Number of patients	HR (95% CI)	p for interaction
Age	<65 years old	159	0.28 (0.05-1.05)	0.502
	≥65 years old	288	0.53 (0.19-1.39)	
Acute myocardial infarction	No	287	0.60 (0.18-1.91)	0.574
	Yes	160	0.38 (0.10-1.16)	
Diabetes	No	267	0.29 (0.07-0.88)	0.452
	Yes	180	0.59 (0.18-1.89)	
Left ventricular ejection fraction	>40%	374	0.32 (0.11-0.83)	0.534
	≤40%	59	0.67 (0.12-3.10)	
Lesion length	≥24 mm	292	0.37 (0.15-0.88)	0.774
	<24 mm	155	0.44 (0.04-2.72)	
Reference vessel diameter	>2.75 mm	185	0.58 (0.13-2.44)	0.799
	≤2.75 mm	262	0.40 (0.14-1.03)	
Severely calcified lesion	No	312	0.25 (0.05-0.88)	0.320
	Yes	135	0.53 (0.18-1.48)	
Ostial lesion	No	353	0.38 (0.13-1.01)	0.850
	Yes	94	0.50 (0.12-1.79)	

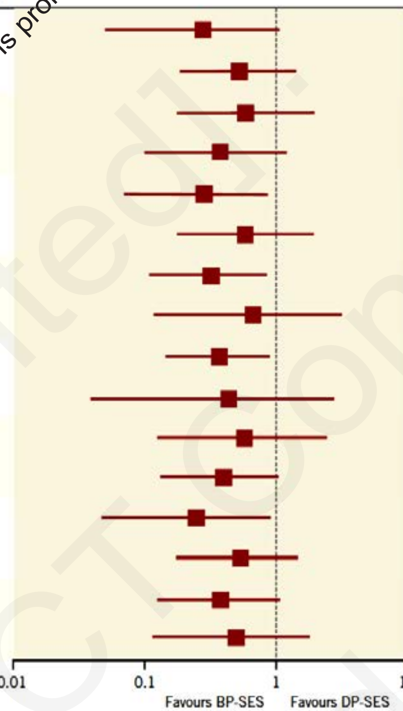

Figure 4. *Forest plot of the composite of cardiac death, stent thrombosis, and target lesion revascularisation.*

Conclusion

- BP SES (Orsiro) was superiror to DP SES (Cypher) for 2 year clinical outcomes.

Hospital Outcomes in patients with STEMI in a developing country

JAKARTACARDIOVASCULAR CARE UNIT NETWORK SYSTEM set up in 2010 to optimize STEMI care

AsiaIntervention 2018;4:92-97

CLINICAL RESEARCH
CORONARY INTERVENTIONS

Hospital outcomes in STEMI patients after the introduction of a regional STEMI network in the metropolitan area of a developing country

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Renan Sukmawan[2], MD, PhD, FIHA; Isman Firdaus[2], MD, FI
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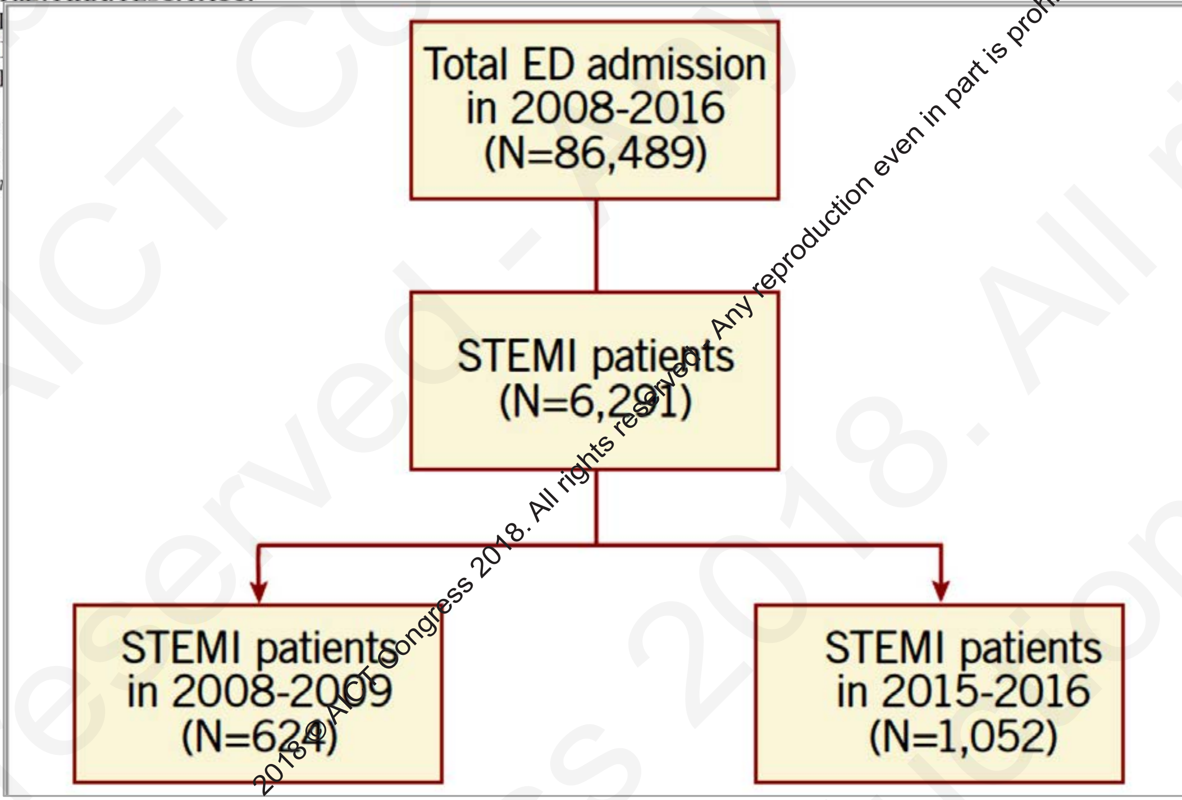

Figure 1. ***Study flow chart***

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Hospital Outcomes in patients with STEMI in a developing country

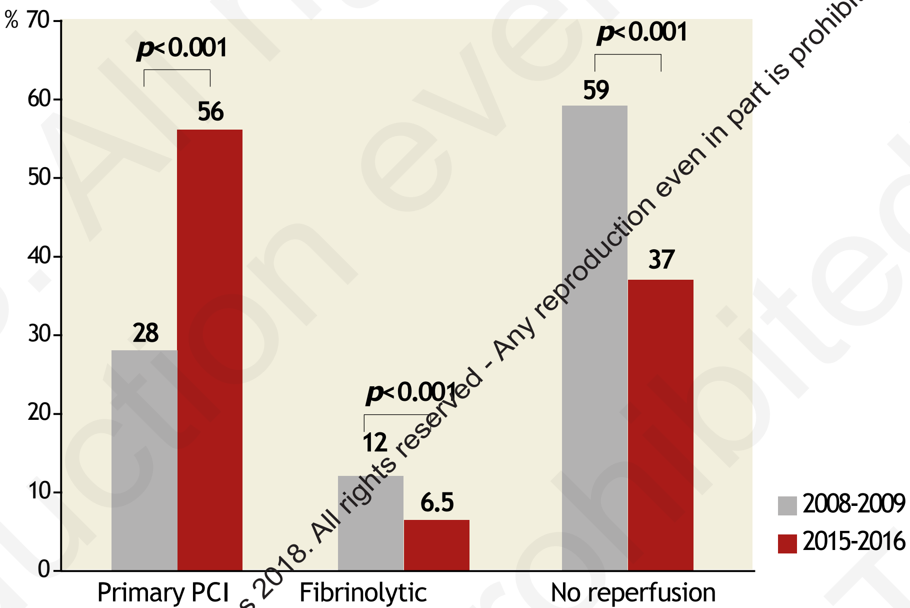

Figure 2. *The characteristics of acute reperfusion therapy between the two periods. PCI: percutaneous coronary intervention*

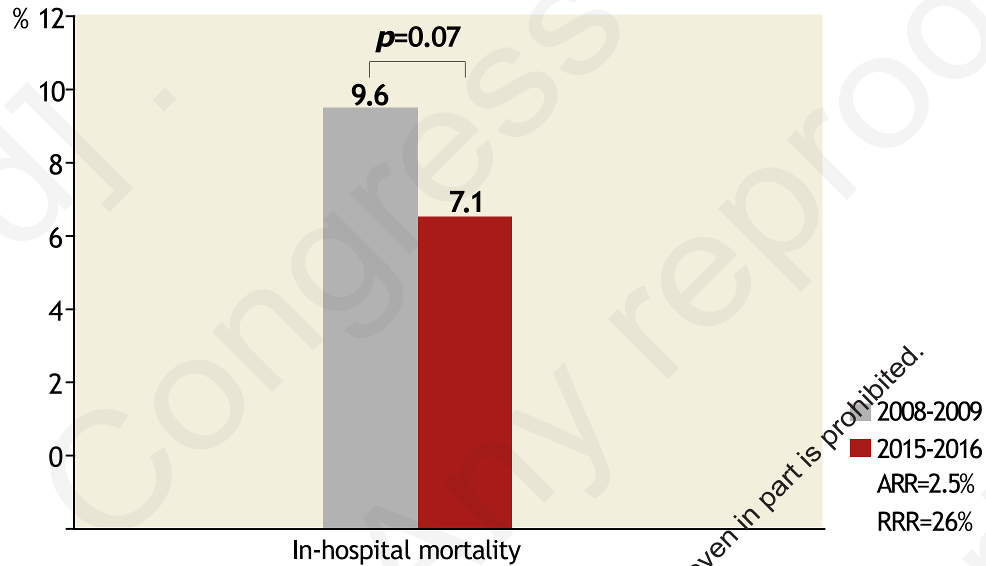

Figure 3. *In-hospital mortality. ARR: absolute risk reduction; RRR: relative risk reduction*

Conclusion

- 5 Years after establishment of STEMI network in Jakarta, Indonesia, Faster and improved care of STEMI pts is achieved and is associated with lower in hospital mortality

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Retrograde algorithm from APCTO

AsiaIntervention 2018;4:98-107

EXPERT REVIEW
CORONARY INTERVENTIONS

Retrograde algorithm for chronic total occlusion from the Asia Pacific Chronic Total Occlusion club

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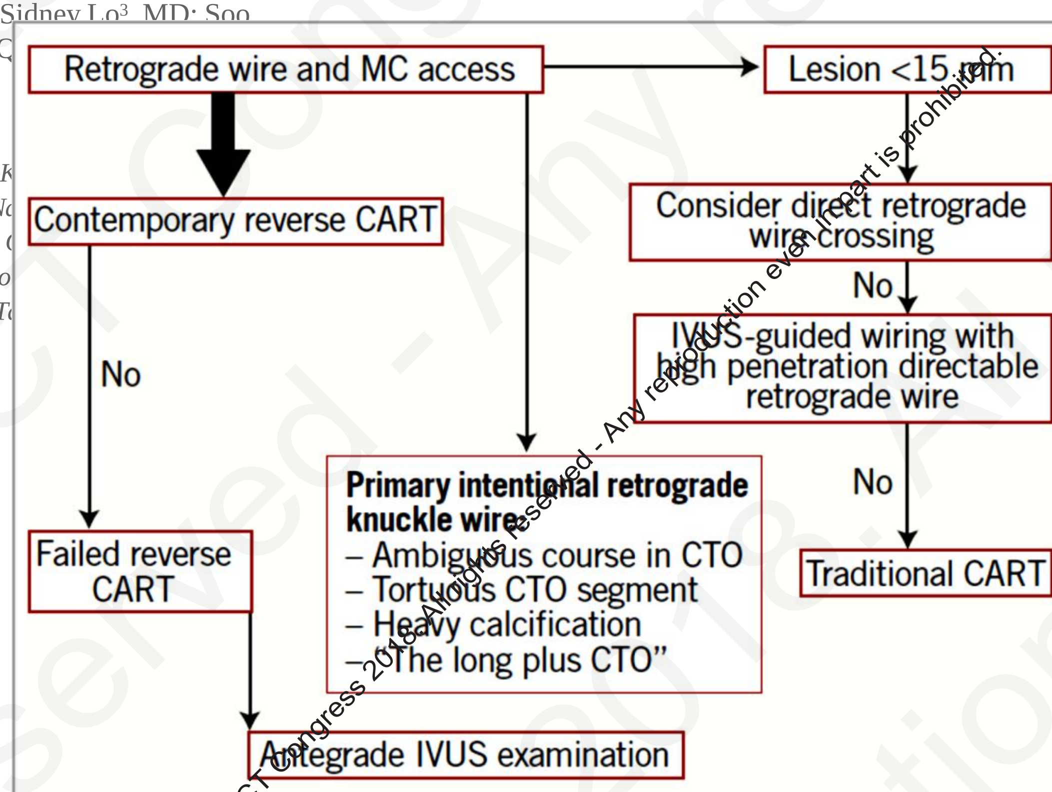

Figure 1. *Asia Pacific Chronic Total Occlusion (APCTO) club algorithm for crossing a CTO lesion via the retrograde approach.*

Retrograde algorithm from APCTO

Table 1. Wires. Wires classified according to use for proximal cap puncture, for retrograde channel crossing and for reverse CART, listed in order of recommended preference.

	Proximal cap puncture	Reverse CART	Channel crossing
High penetration force wires	Conquest/CONFIANZA 12g, Pro 9g, Hornet 14 (Boston Scientific)	Gaia Third, Conquest/CONFIANZA 12g, Hornet 14	NA
Intermediate penetration force wires	Pilot 200, Miracle 12g, Gaia Second (if vessel course unclear)	Gaia Second, Gaia Third	NA
Low penetration force wires	NA	XT-A (for single wire retrograde crossing)	SION, SUOH 03, Sumarai RC (Boston Scientific), XT-R, SION black

NA: not applicable

Table 2. Tips for channel crossing.

Channel	Angio	Tips	First wire	Second choice small channel	Second choice for tortuous channel	Third choice for tortuous channel
L → R septals	Selective injection*	Further distal selective injection with rotational angiogram	SION	XT-R	SUOH 03	SION black
R → L septals	Non-selective injection (or via twin lumen)	Twin lumen catheter to overcome retroflex ostium	SION	XT-R	SUOH 03	SION black
Epicardial	Selective injection*	Microcatheter follows the wire technique	SUOH 03	XT-R/SION	SION/XT-R	SION black if large epicardial channel

* Selective angiography should be performed with biplane or rotational angiography.

Table 3. Tips for crossing microcatheter through channel.

Channel	Corsair/Turnpike will not cross	Switched microcatheter will not cross	Failure to cross after balloon dilatation
L → R septal	Switch to Caravel/Turnpike LP*	1.25 mm balloon to dilate channel	Side branch anchor balloon
R → L septal			Beware too tortuous PDA to septal channel angle
Epicardial		Switch to Finecross	Beware too small channel

* If septal ostium stented → dilate septal ostium with small balloon.

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ASIAN INTERVENTIONAL CARDIOVASCULAR THERAPEUTICS

THE OFFICIAL CONGRESS OF APSIC

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