
SOLACI '12
MEXICO DF
In partnership with TCT
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Dr. Antonio Dager Gómez
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Conduction Abnormalities During TAVI

Angiografía de Occidente S.A.
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Cali - Colombia

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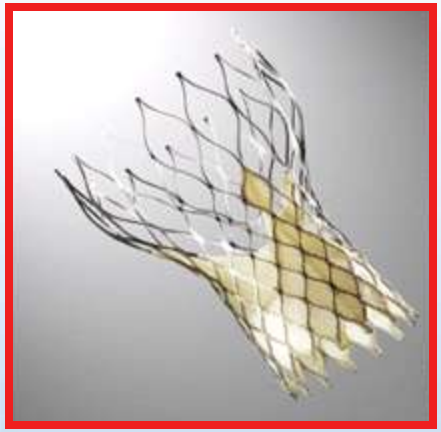
TAVI Conduction studies

1. Sinhal et al. JACC Interv 2008, n=123
2. Piazza et al. JACC Interv 2008, n=40
3. Calvi et al. PACE 2009, n=30
4. Jilaihawi et al. Am Heart J 2009, n=34
5. Baan et al. Am Heart J 2010, n=34
6. Gutierrez et al. Am [illegible] eart J 2009, n=33
7. Bleiziffer et al. J[illegible] rv 2010, n=123
8. Latsios et al. Cath [illegible] nterv 2010, n=81
9. [illegible]
10. Piazza et [illegible] 10, n=91
11. Rot[illegible] =67
12. Haworth [illegible] al. Cath Cardiovasc Interv [illegible] 0, n=33
13. Godin et al. Am J Cardiol 2010, n=69
14. Ferreira et al. Pacing Clin Electrophysiol 2010, n=32
15. Aktug et al. Intern J Cardiol 2011, n=154
16. Koos et al. J Heart Valve Dis 2011, n=80
17. Fraccaro et al. Am J Cardiol 2011, n=64
18. Rubin et al. Circ Cardiovasc Interv, n=18
19. Khawaja et al. Circulation, n=270
20. D'Ancona et al. Int Cardiovasc Thor Surg, n=322

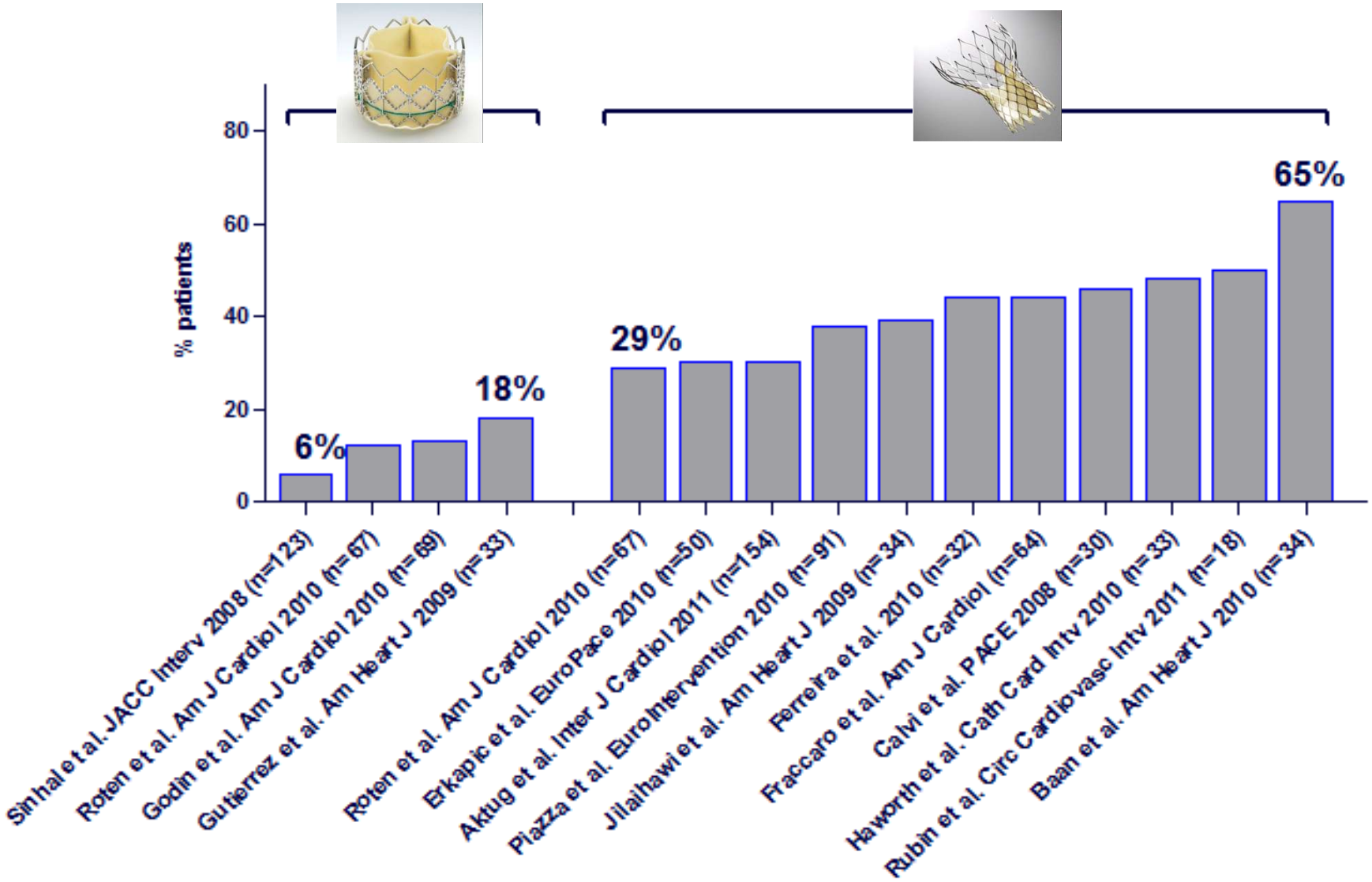
1748 patients

CoreValve

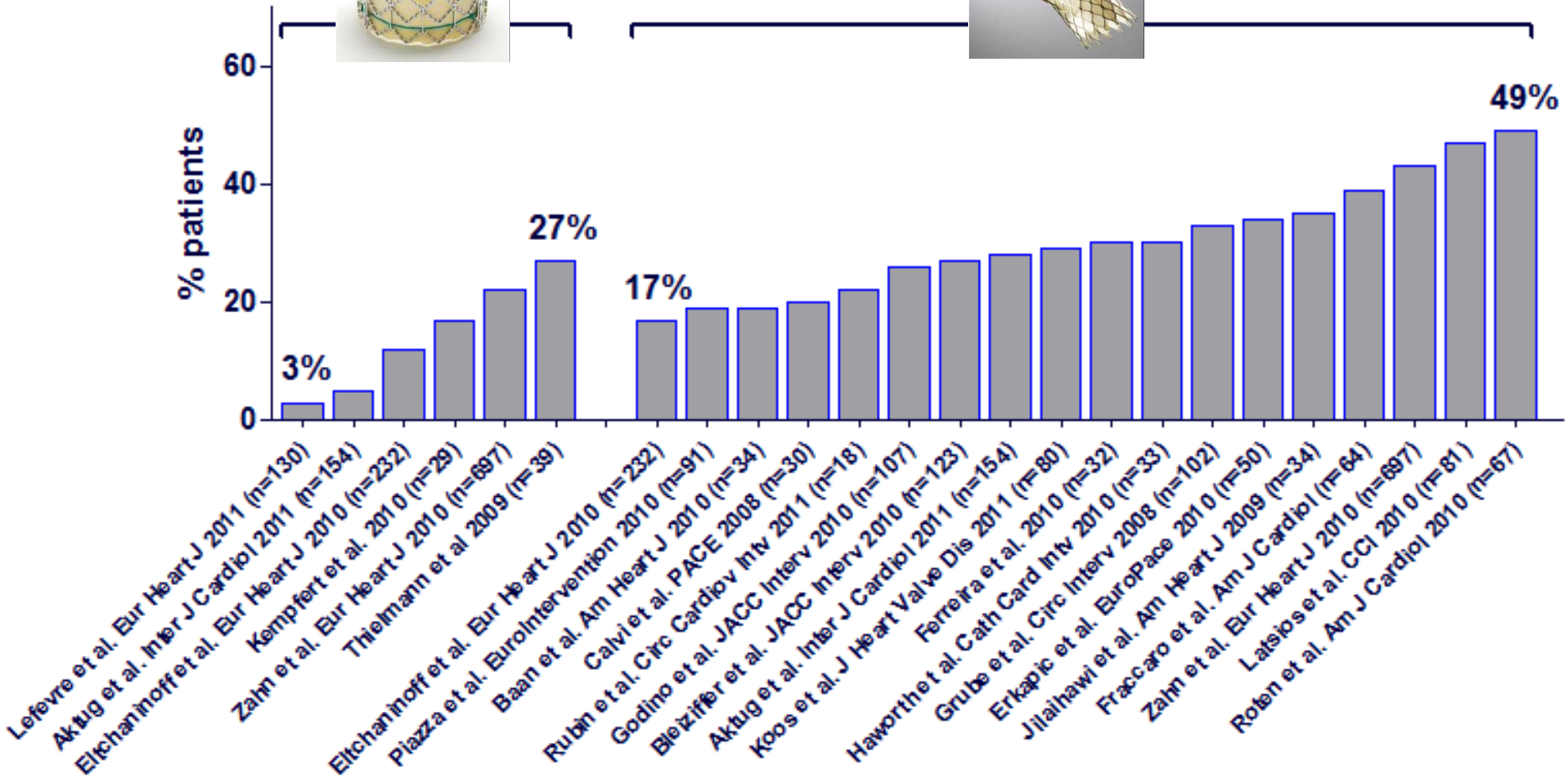


Edwards

Frequency of new LBBB



Frequency of new PPM



Predictors of new LBBB/PPM

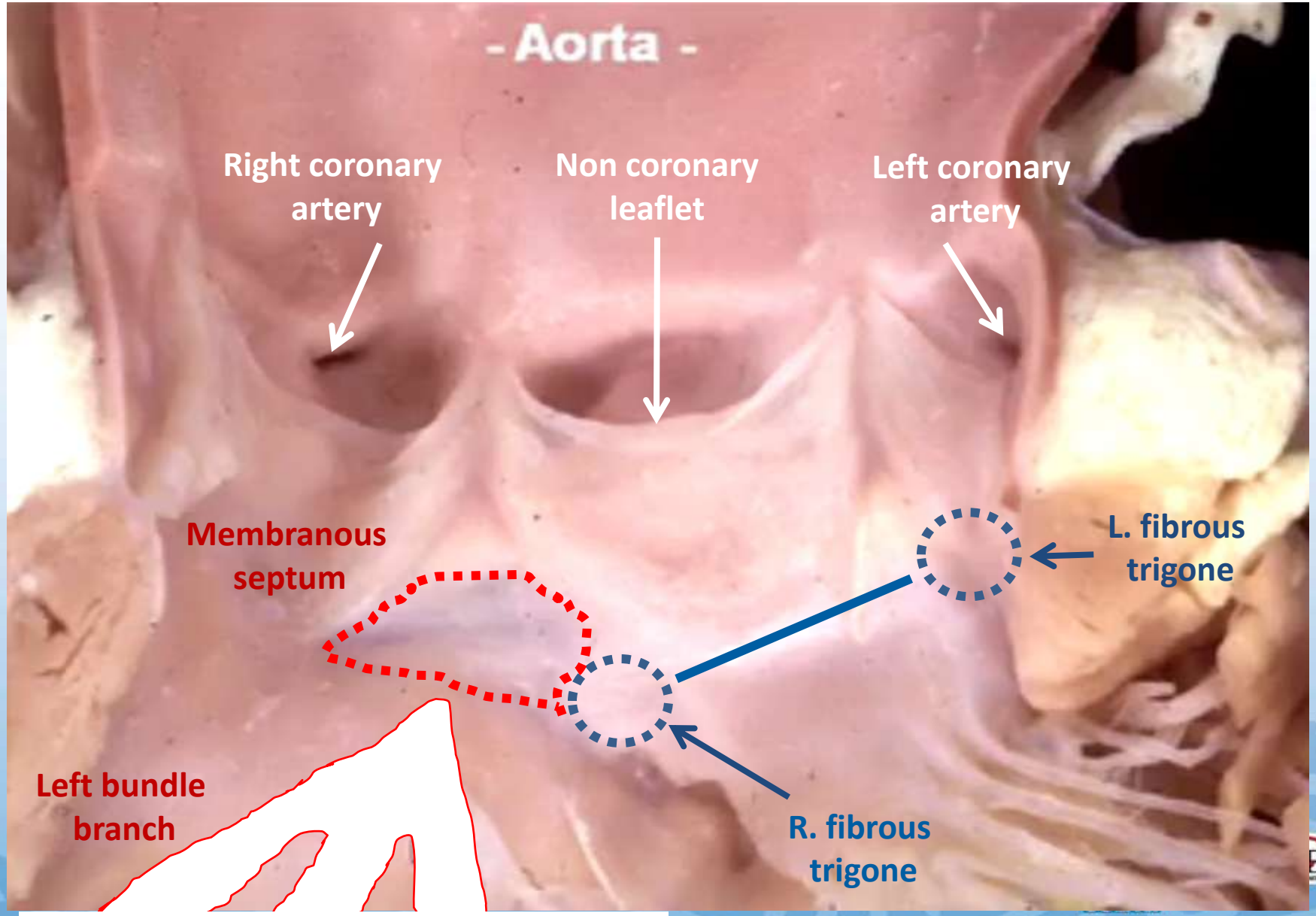
Patient-related

small LVOT
pre-existing RBBB
left [illegible]ation
pre-existing RBBB
ac[illegible]tion
m[illegible]nnulus cal[illegible]ion
left ventricular dysfunction
borderline small annulus size
thickness of non-coronary cusp
previous myocardial infarction
device landing zone calcification

Procedure-related

CoreValve
d[illegible]tion
Post implantation frame [illegible]xpansion
depth implantation

Aortic Valvar Complex



Predictors of new LBBB/PPM

Patient-related

small LVOT
pre-existing RBBB
left [illegible]ation
pre-existing RBBB
ac[illegible]tion
m[illegible]annulus calc[illegible]ion
left ventricular dysfunction
borderline small annulus size
thickness of non-coronary cusp
previous myocardial infarction
device landing zone calcification

Patient selection

Procedure-related

CoreValve
d[illegible]tion
Post implantation frame [illegible]xpansion
depth implantation

Technical modifications

Predictors of new LBBB/PPM

Procedure-related

CoreValve

d tion

Post in lantation frame xpansion

depth implantation

Technical modifications

Predictors of new LBBB/PPM

Moment of valve expansion/anchoring

=

new CA?

Procedure-related

CoreValve

depth implantation

Technical modifications

Predictors of new LBBB/PPM

European Heart Journal Advance Access published May 28, 2011

European Heart Journal
doi:10.1093/eurheartj/ehr110

CLINICAL RESEARCH

Timing and potential mechanisms of new conduction abnormalities during the implantation of the Medtronic CoreValve System in patients with aortic stenosis

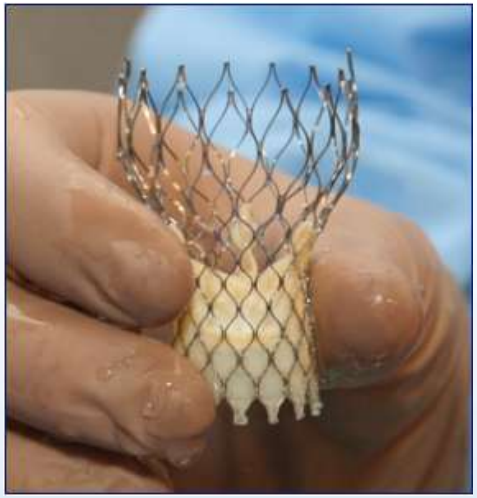
Rutger-Jan Nuis, Nicolas M. Van Mieghem, Carl J. Schultz, Apostolos Tzikas, Robert M. Van der Boon, Anne-Marie Maugenest, Jin Cheng, Nicolo Piazza, Ron T. van Domburg, Patrick W. Serruys, and Peter P. de Jaegere*

Department of Cardiology, Erasmus Medical Centre, Rotterdam, The Netherlands

Received 6 January 2011; revised 28 February 2011; accepted 20 March 2011

Technical modifications

Methods

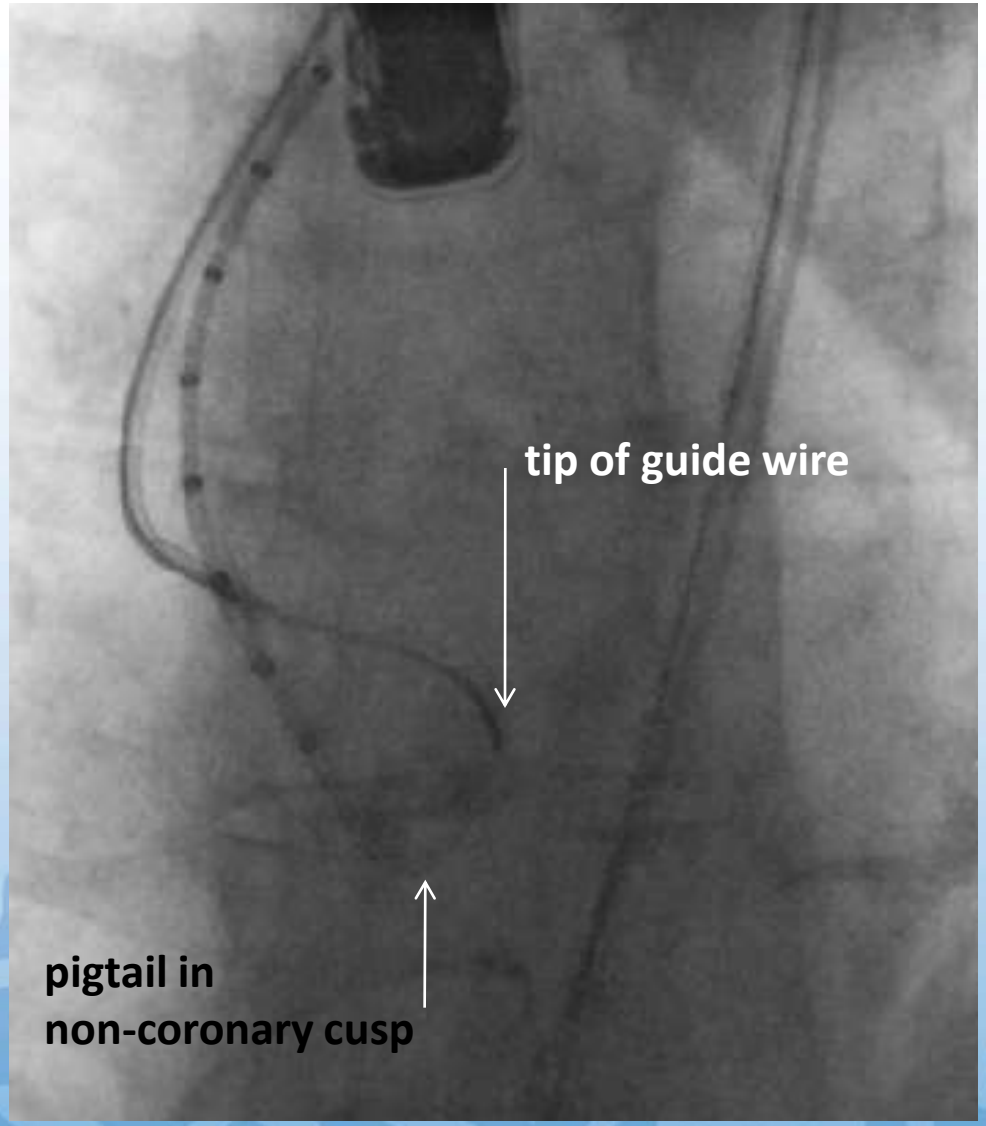


- Design: prospective single center
- Population: 65 consecutive pts MCS
- Enrollment: March 2009 – August 2010

- New CA: LBBB / RBBB / AV3B
- Peri-procedural ECG analysis: pre, post, discharge
- Intra-procedural ECG analysis: continuous 12-lead ECG

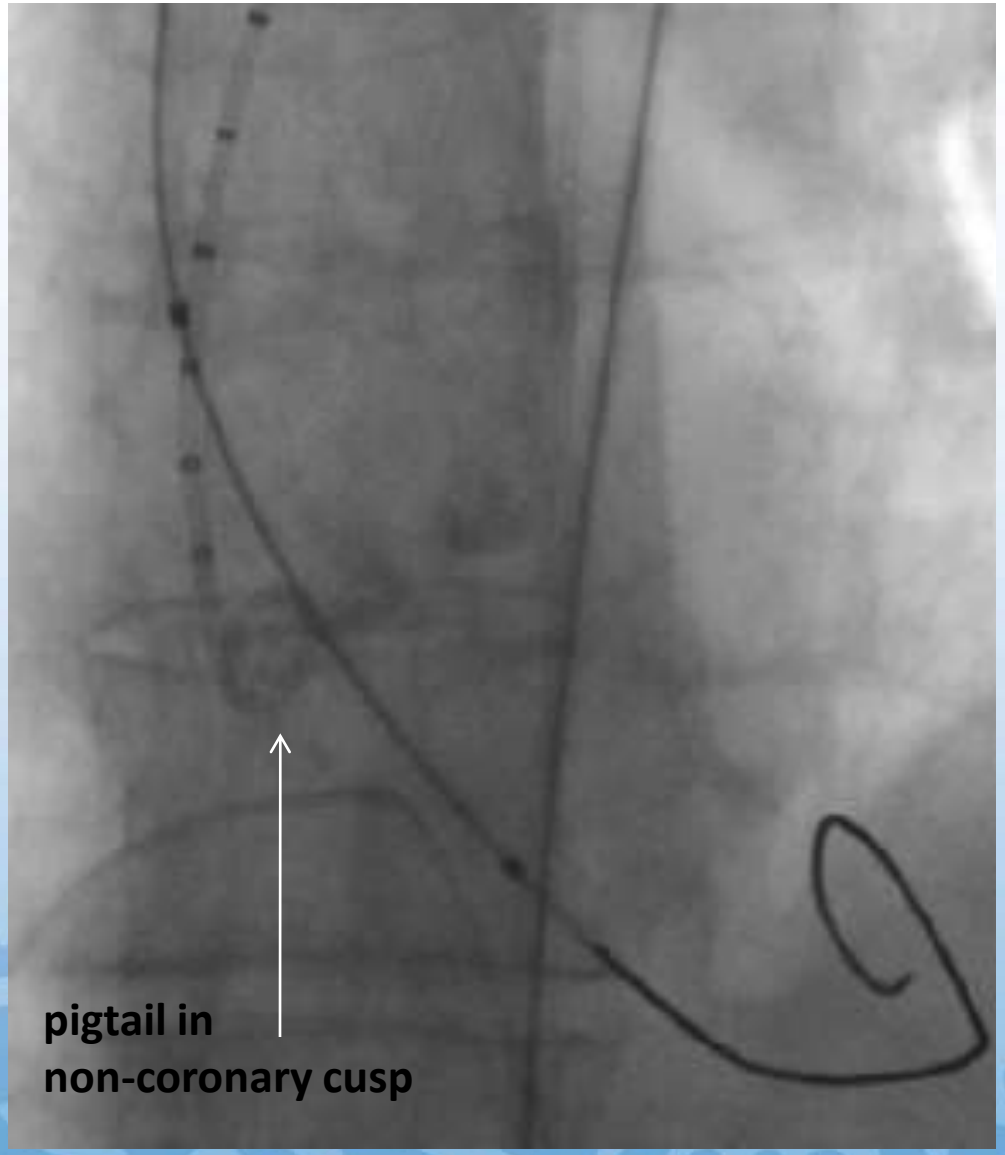
Timing CA during TAVI

PHASE 1:
guide wire passes aortic valve



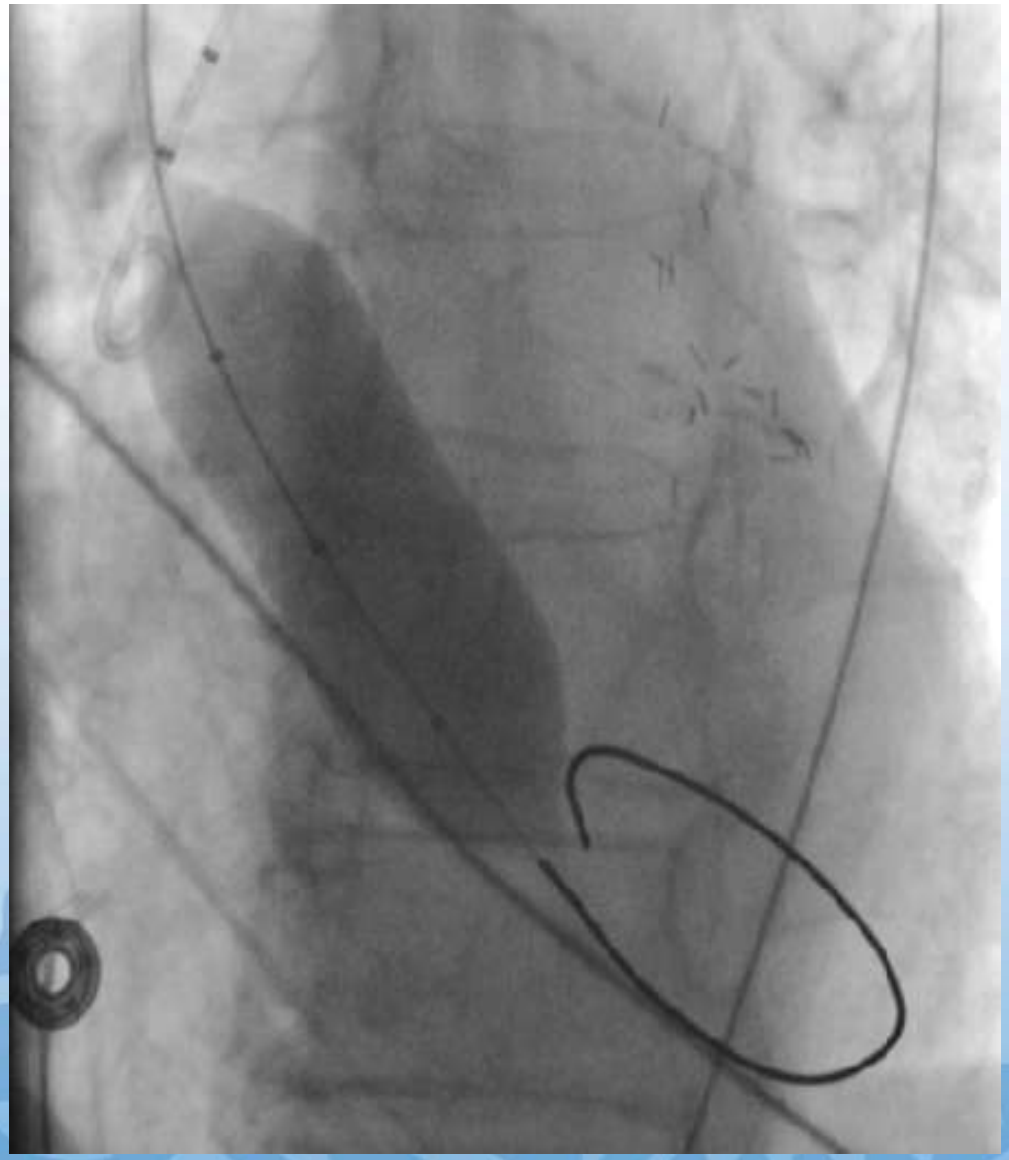
Timing CA during TAVI

PHASE 2:
positioning balloon catheter in annulus



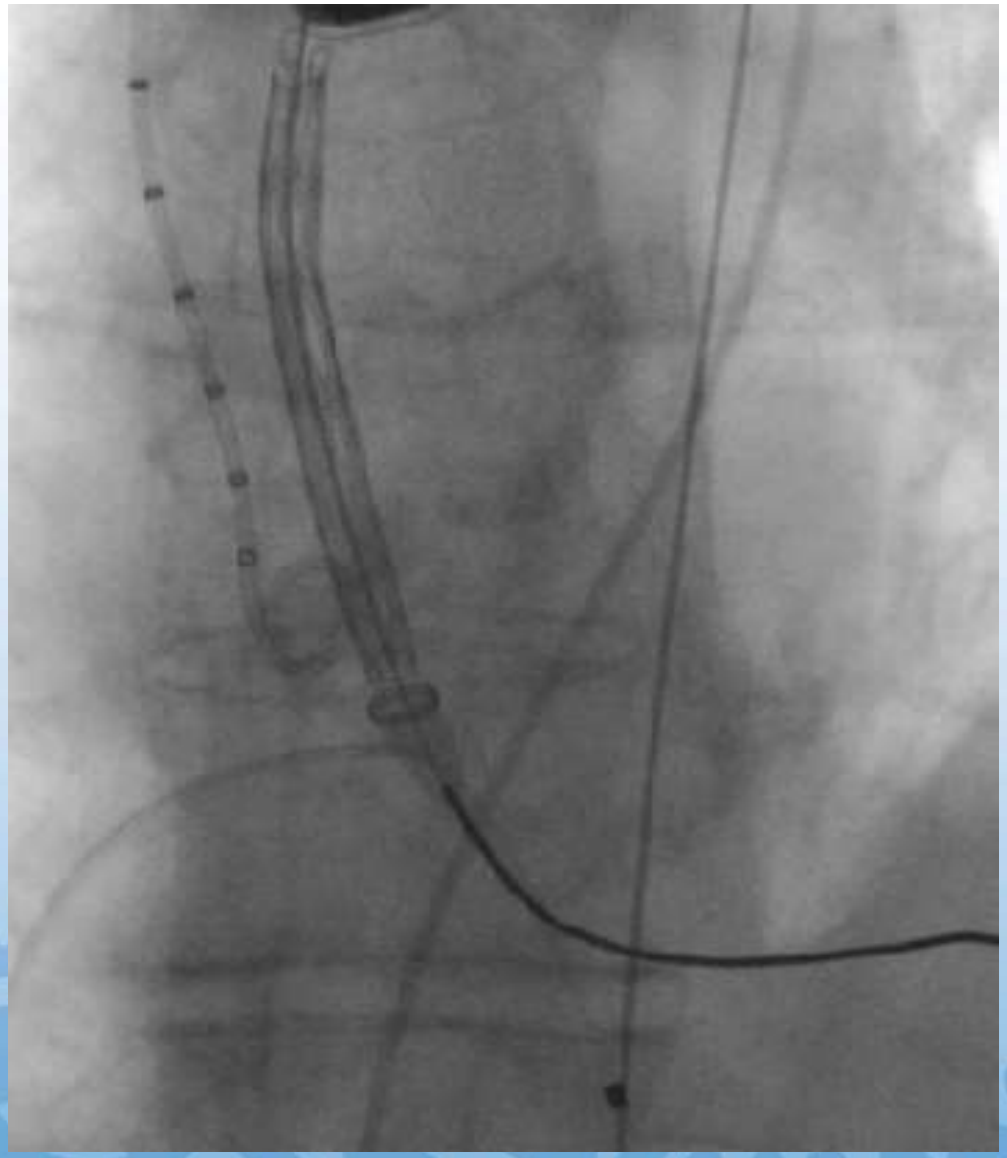
Timing CA during TAVI

PHASE 3:
balloon valvuloplasty



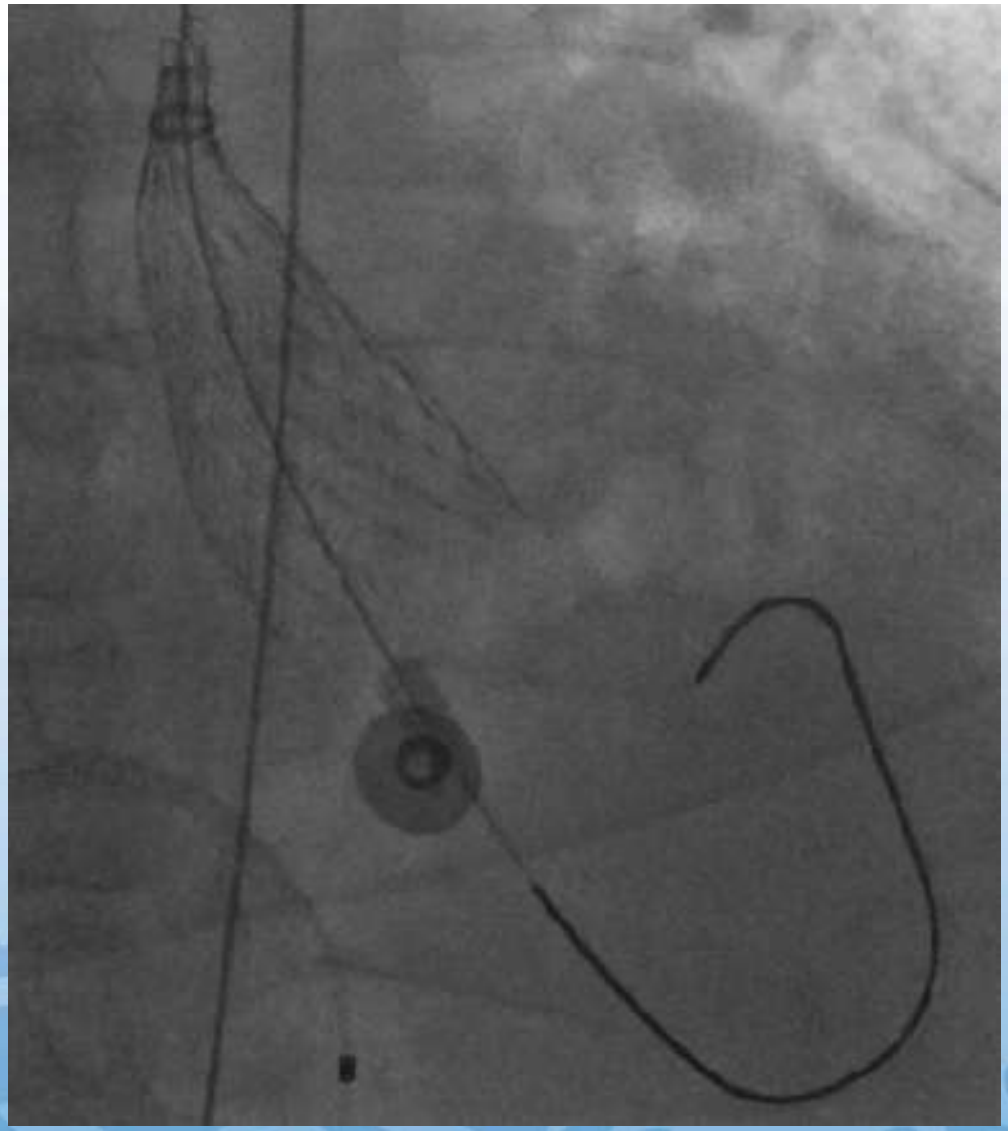
Timing CA during TAVI

PHASE 4:
positioning MCS delivery catheter in annulus



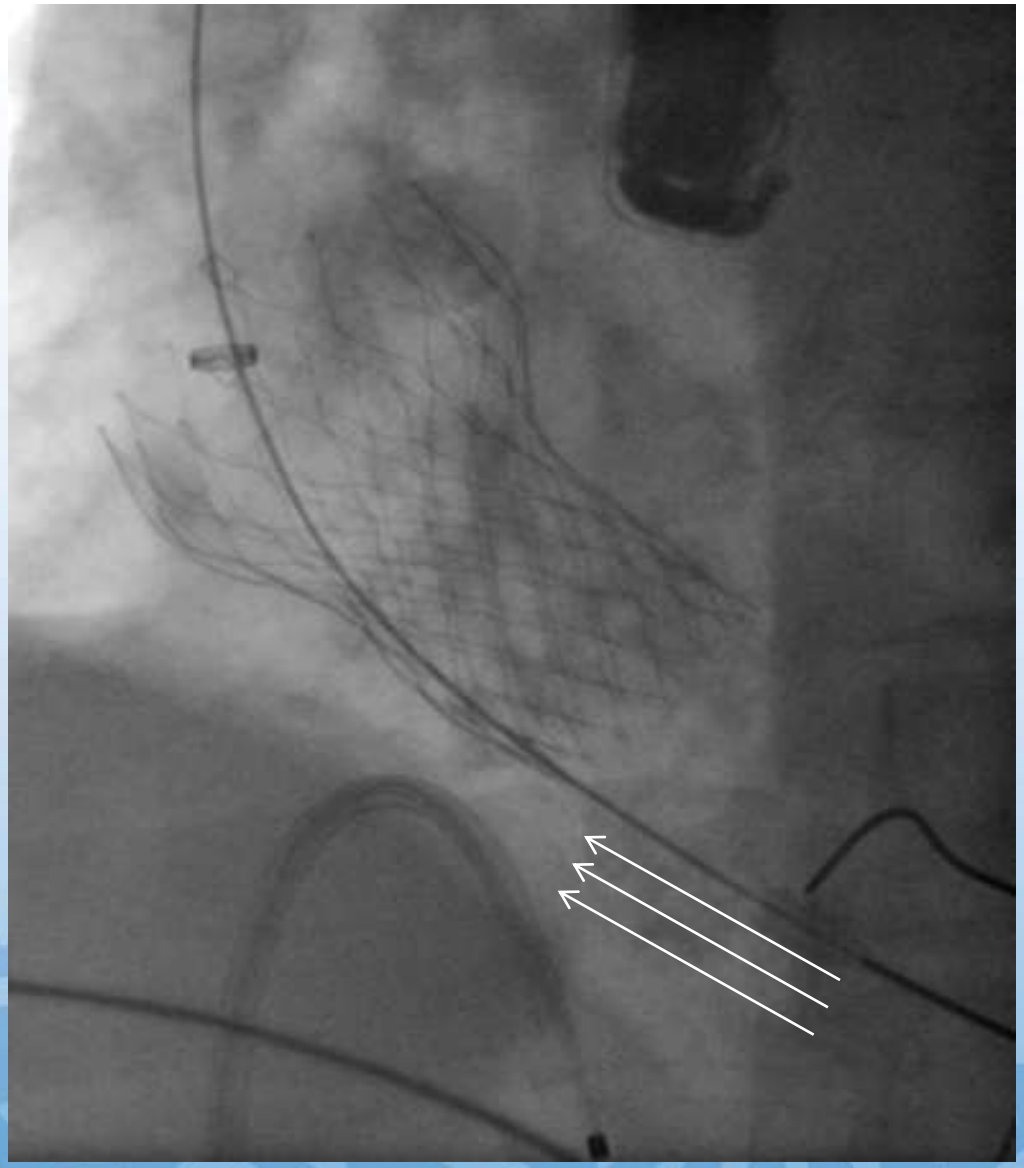
Timing CA during TAVI

PHASE 5:
expansion
MCS

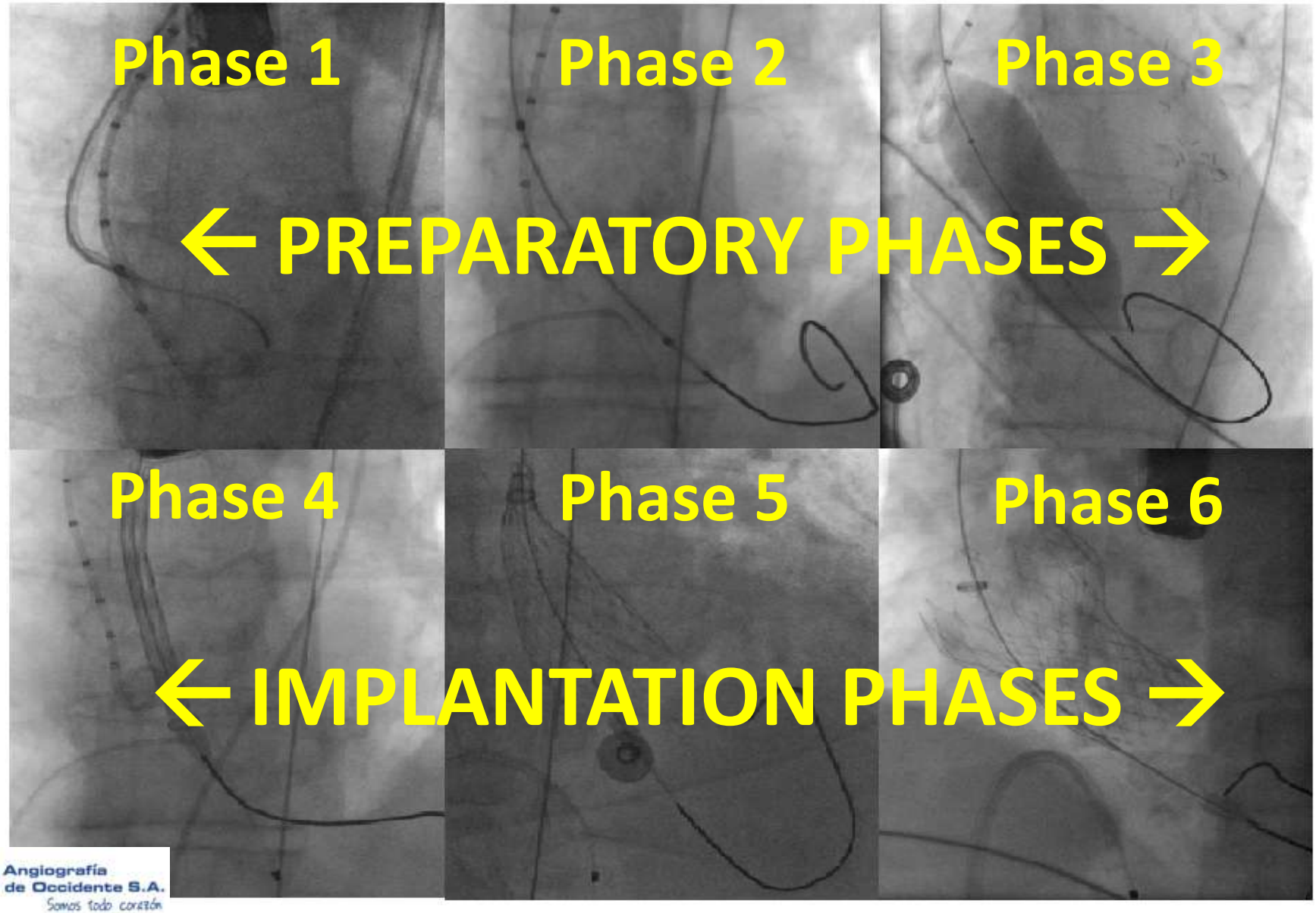


Timing CA during TAVI

PHASE 6:
removal all catheters and wires



Timing CA during TAVI



Baseline characteristics

Characteristic (n=65)	%
Age	80 ± 8
Male	49
BMI	26 ± 4
History stroke	23
History MI	28
History CABG	19
History PCI	32
Diabetes	22
Hypertension	37
COPD	32
Creatinine	107 ± 73

Baseline characteristics

Characteristic (n=65)	%
LVEF ≤35%	8
Aortic valve area (cm2)	0.7 ± 0.2
MR ≥ III	14
AR ≥ III	11
Logistic EuroSCORE	11 (9-19)
STS score	4 (3-6)

Results

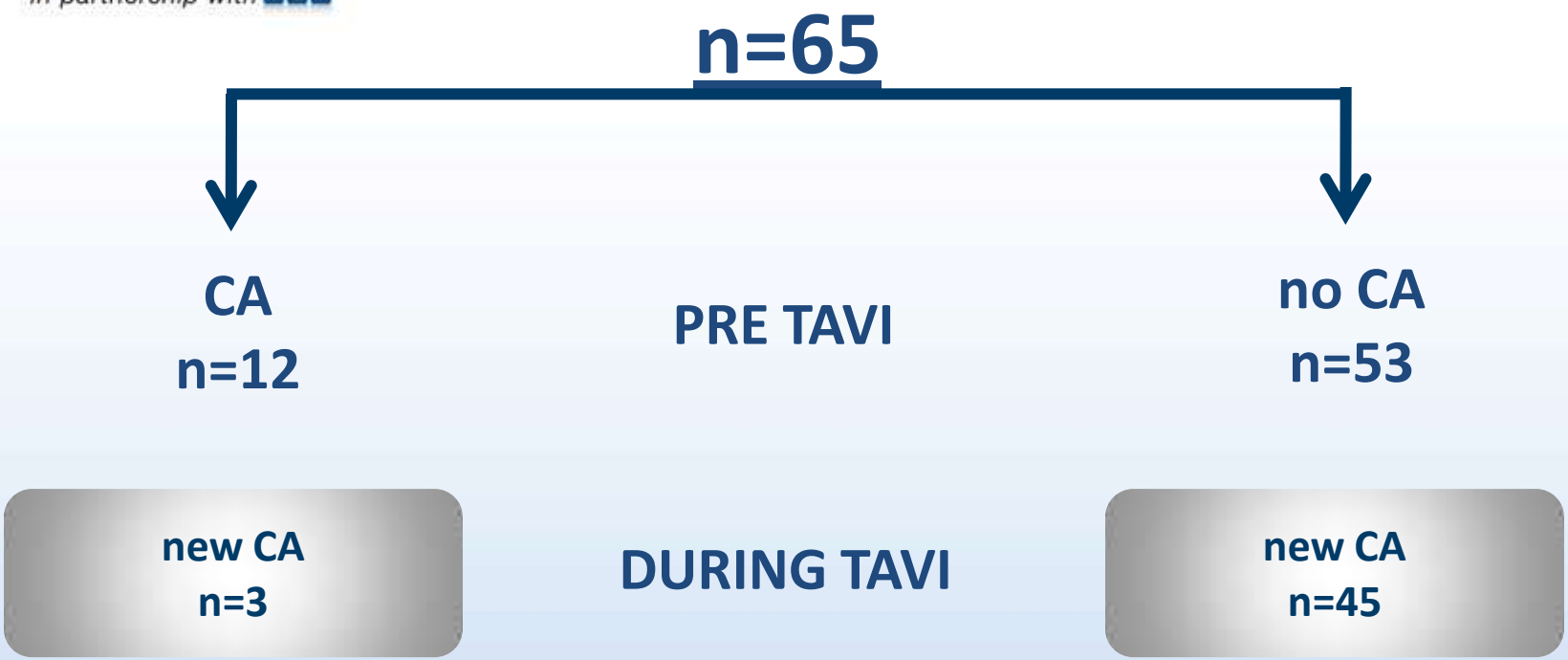
n=65

CA
n=12

PRE TAVI

no CA
n=53

Results



Results


n=65
CA
n=12
PRE TAVI
no CA
n=53
new CA
n=3
DURING TAVI
new CA
n=45
new CA
n=1
POST TAVI
new CA
n=4

Results

n=65

CA n=12		no CA n=53
	PRE TAVI	
new CA n=3	DURING TAVI	new CA n=45
new CA n=1	POST TAVI	new CA n=4

n=53 or 82% new peri-procedural CA

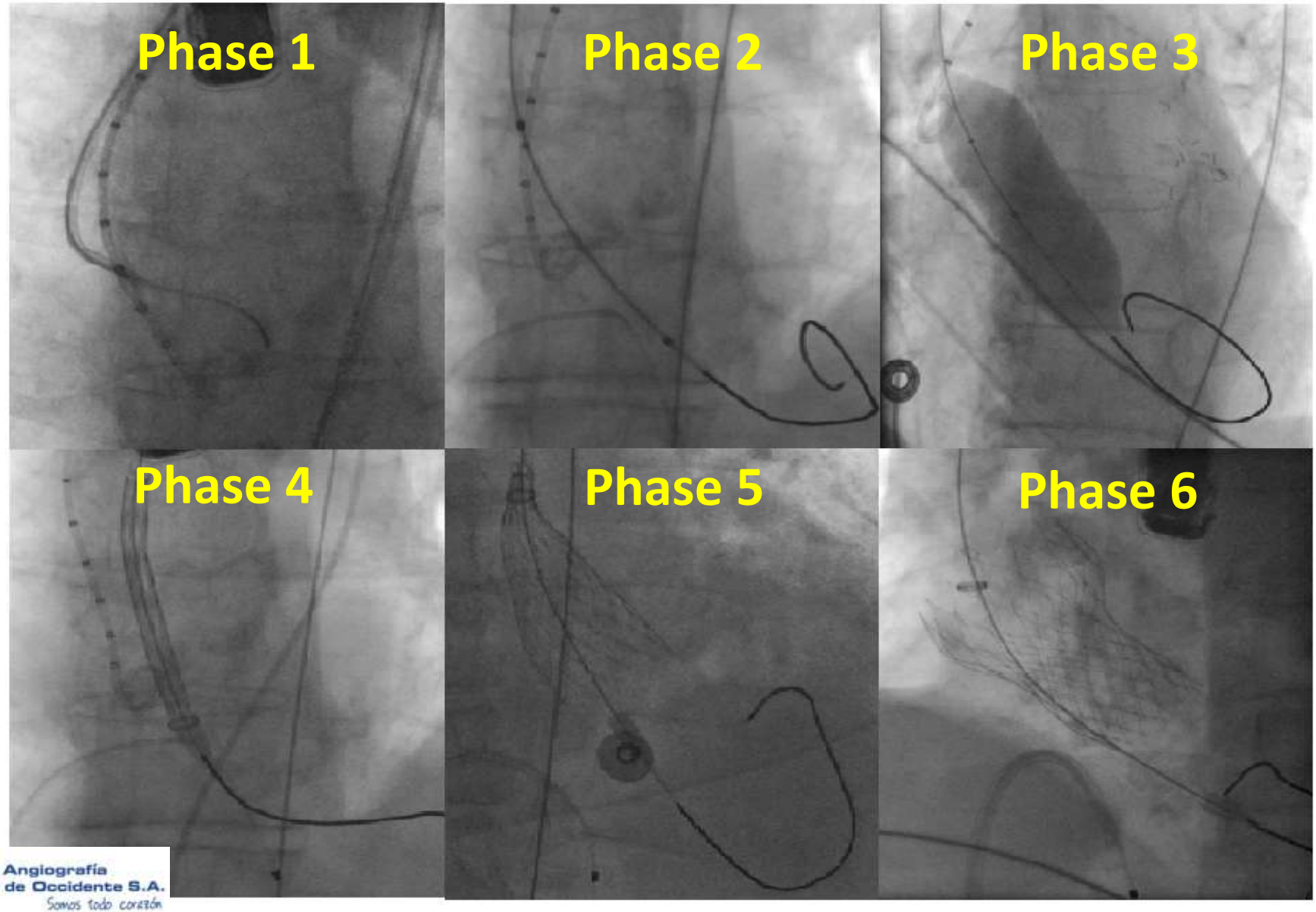
Results

n=65

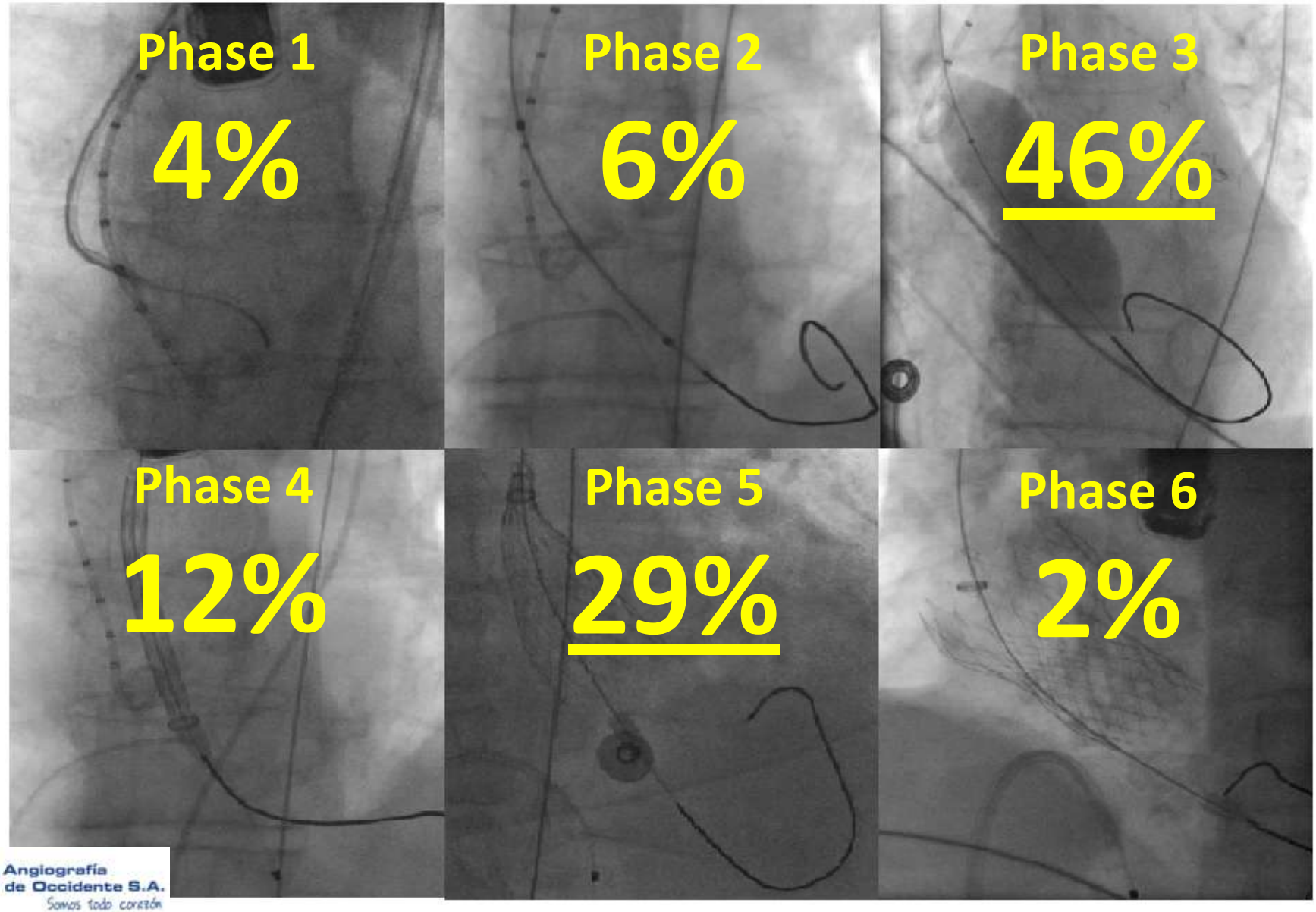
CA n=12		no CA n=53
	PRE TAVI	
new CA n=3	DURING TAVI	new CA n=45
new CA n=1	POST TAVI	new CA n=4

n=53 or 82% new peri-procedural CA

Timing new CA during TAVI n=48



Timing new CA during TAVI n=48



Causes of new LBBB

- Device type (CoreValve vs. Edwards)
- Depth of implantation (4-6 mm below NCC)
- Balloon-annulus ratio > 1.0

What are the clinical implications of new LBBB?

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LBBB persistence

Persistent conduction abnormalities and requirements for pacemaking six months after transcatheter aortic valve implantation

Nicolo Piazza[1], MD; Rutger-Jan Nuis[1], MD; Apostolos Tzikas[1], MD; Amber Otten[1], MD; Yoshinobu Onuma[1], MD; Hector Garcia Garcia[1], MD; Carl Schultz[1], MD; Ron van Domburg[2], PhD; Gerrit-Anne

at 6 months,
LBBB had resolved in 20%, p=0.39

Predictive factors and long-term clinical consequences of persistent left bundle branch block following TAVI with a Balloon Expandable valve

Urena M – Rodes-Cabau J et al. JACC *in press*

at 6 months,
LBBB had resolved in 57%, p=0.04

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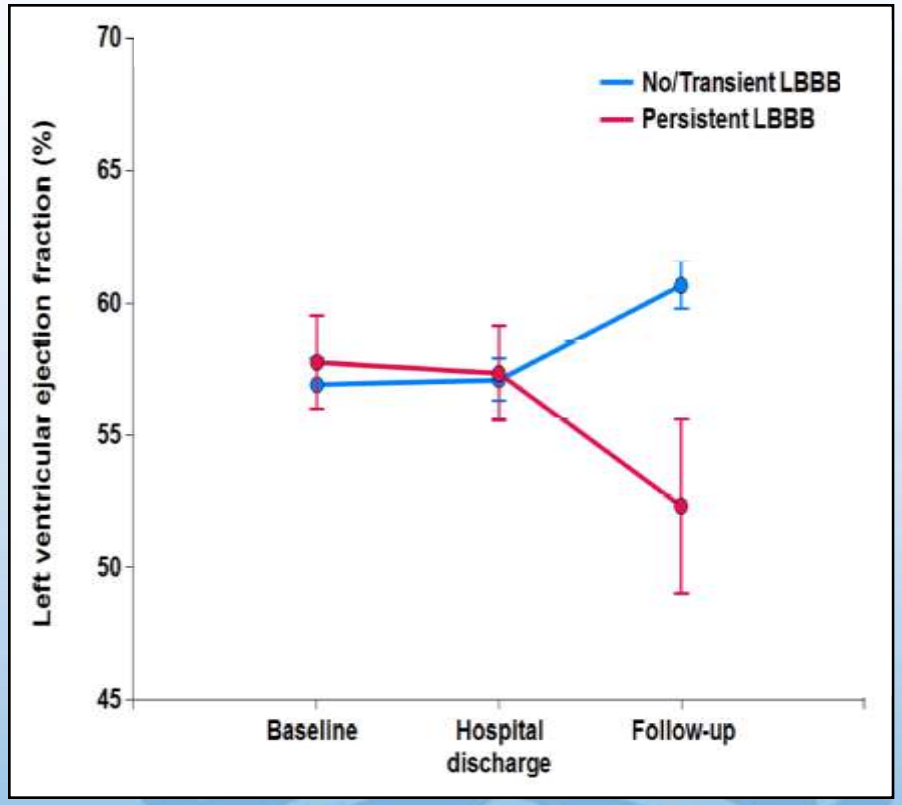
LBBB and adverse outcome

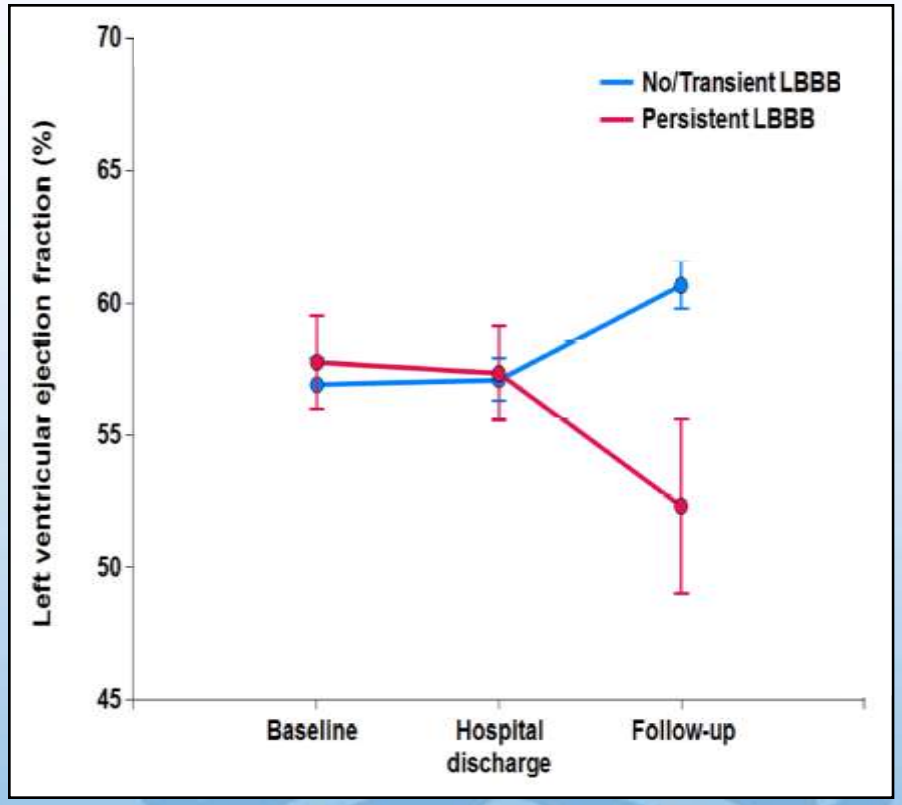
LVEF



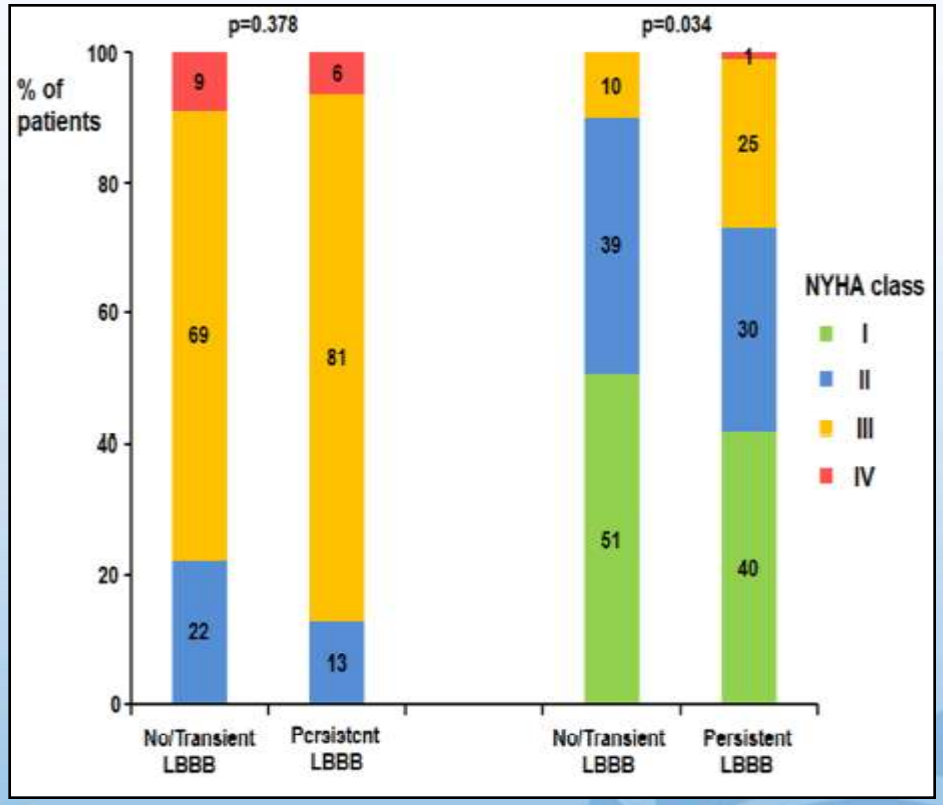
Urena – Rodes-Cabau et al. JACC *in press*

LBBB and adverse outcome

LVEF



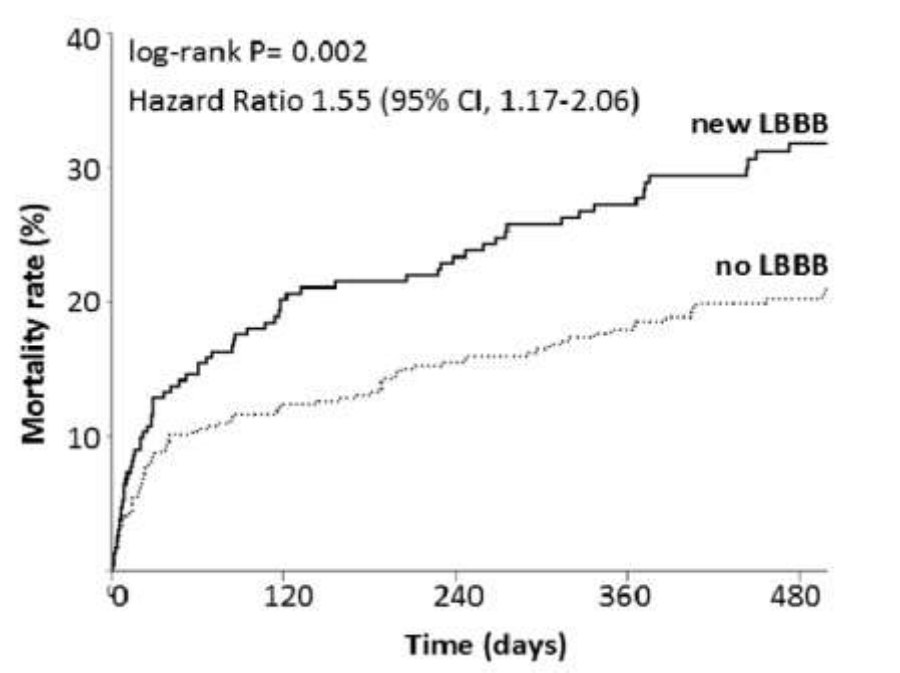
NYHA class



Urena – Rodes-Cabau et al. JACC *in press*

LBBB/PPM and Death Risks

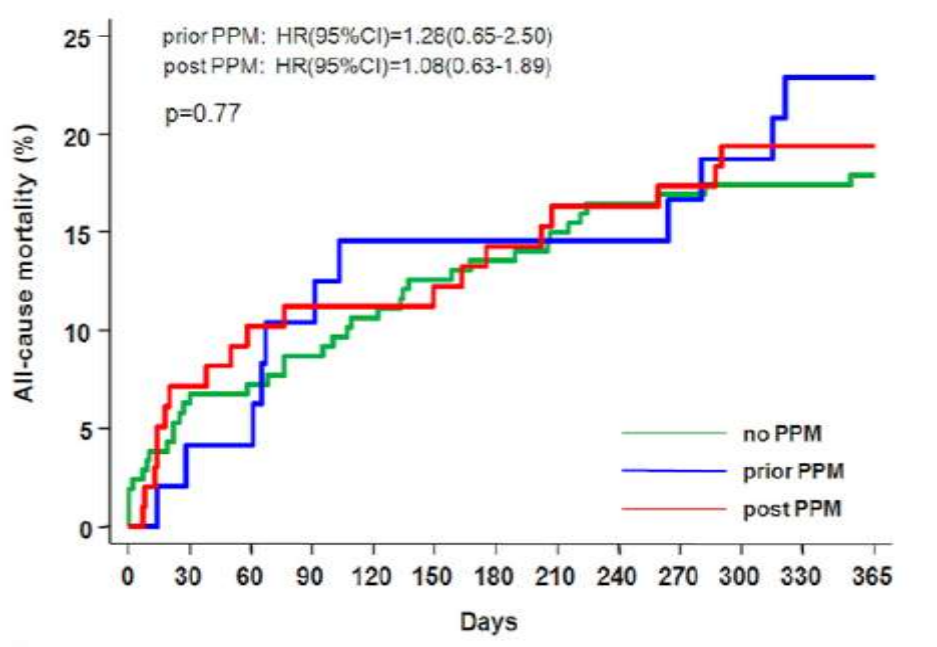
New LBBB



n = 679 patients
HR 1.54 (1.12-2.10)

Houthuizen / van Garsse et al.
Circulation *in press*

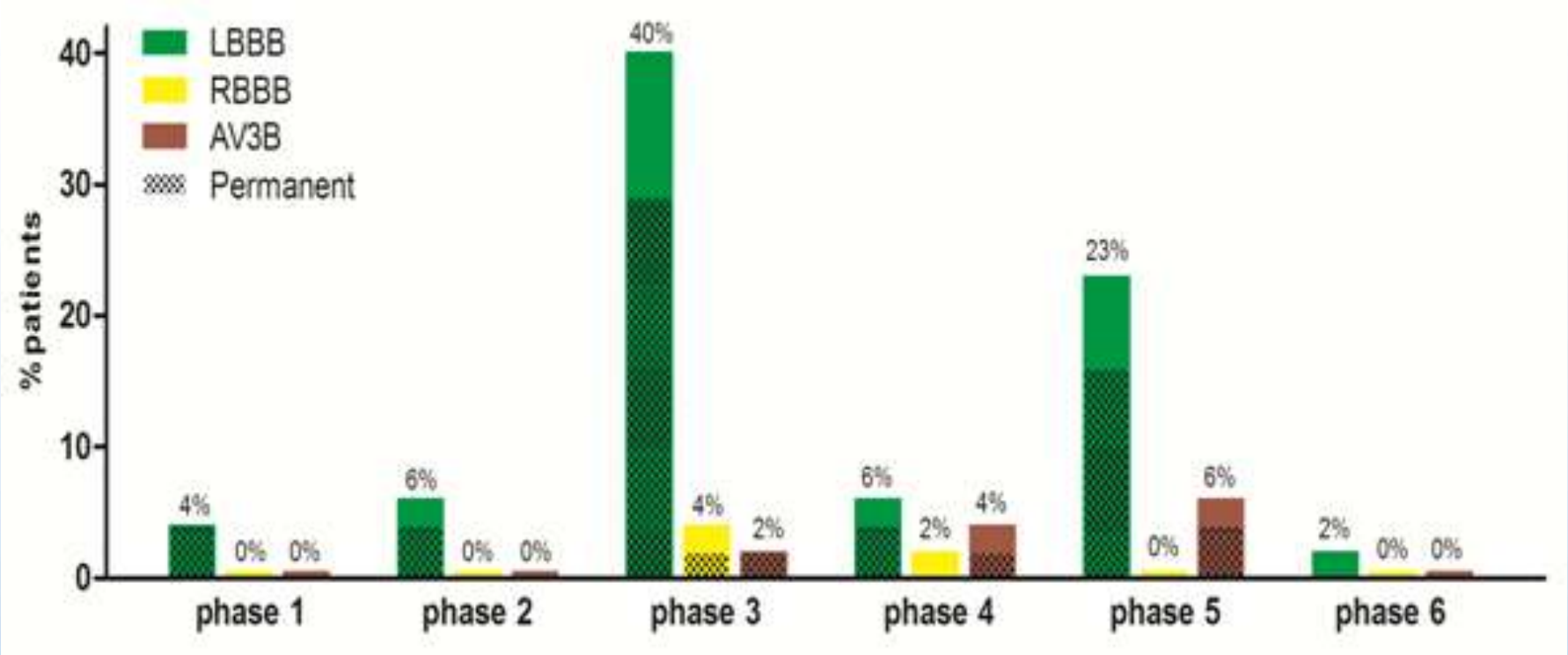
New PPM

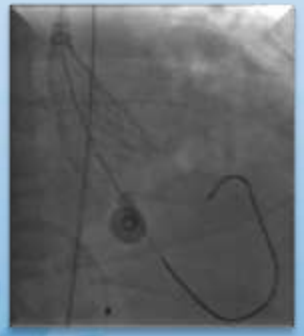


n = 353 patients
HR 1.08 (0.63-1.89)

Buellesfeld et al.
J Am Coll Cardiol *in press*

Timing new CA during TAVI n=48





Results

n=65

CA n=12		no CA n=53
	PRE TAVI	
new CA n=3	DURING TAVI	new CA n=45
new CA n=1	POST TAVI	new CA n=4

n=53 or 82% new peri-procedural CA

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Results

n=65

CA n=12	PRE TAVI	no CA n=53
new CA n=3	DURING TAVI	new CA n=45
new CA n=1	POST TAVI	new CA n=4
AV3B day 5		LBBB day 0 LBBB day 0 LBBB day 2 LBBB day 5

n=53 or 82% new peri-procedural CA

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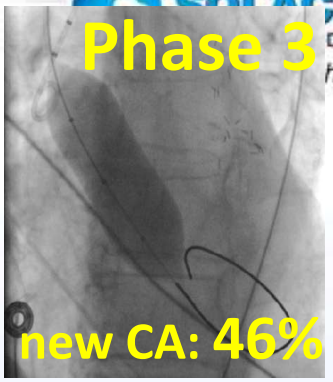
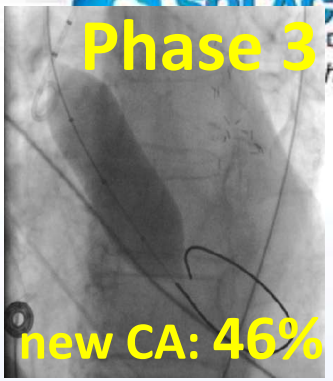
Mechanisms new CA



	CA phase 3	
	yes	no
balloon-annulus ratio		
valve-annulus ratio		
depth valve implant		
leucocytes <24 hr		
CRP <24 hr		

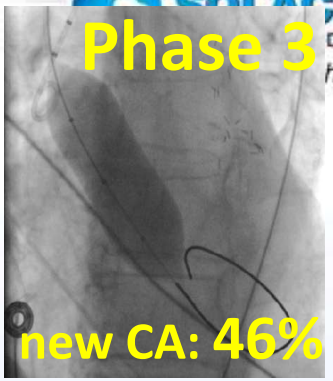
Mechanisms new CA

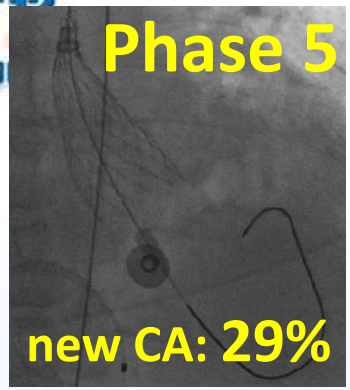


p=0.030

	CA phase 3	
	yes	no
balloon-annulus ratio	1.10	1.03
valve-annulus ratio	1.36	1.30
depth valve implant	9.01	8.01
leucocytes <24 hr	11.3	11.4
CRP <24 hr	64	64

Mechanisms new CA

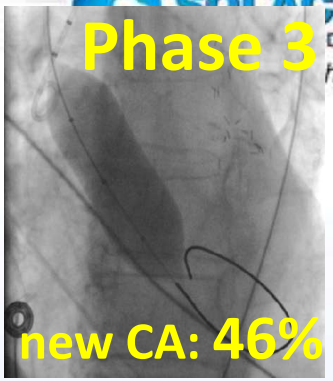


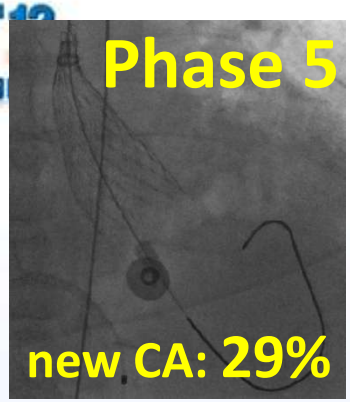


p=0.030

	CA phase 3		CA phase 5	
	yes	no	yes	no
balloon-annulus ratio	1.10	1.03		
valve-annulus ratio	1.36	1.30		
depth valve implant	9.01	8.01		
leucocytes <24 hr	11.3	11.4		
CRP <24 hr	64	64		

Mechanisms new CA





p=0.030

	CA phase 3		CA phase 5	
	yes	no	yes	no
balloon-annulus ratio	1.10	1.03	1.06	1.06
valve-annulus ratio	1.36	1.30	1.30	1.33
depth valve implant	9.01	8.01	7.76	8.66
leucocytes <24 hr	11.3	11.4	14.1	10.4
CRP <24 hr	64	64	71	62

p=0.001

Conclusiones

- TAVI con MCS esta asociado con nuevos defectos de conducción periprocedimiento en 82% de los casos (74% durante TAVI, 8% después de TAVI)
- >50% de los nuevos defectos de conducción ocurren durante las fases preparatorias y por lo tanto antes del verdadero implante de la válvula.
- Especialmente esos defectos de conducción pueden prevenirse con la adecuada selección del tamaño del balón (relación anillo-balón cercana a 1.0)

Conclusiones

- Lo ultimo también es aplicable a los dispositivos EDWARDS
- La asociación entre aumento en los parámetros inflamatorios y nuevas anormalidades de conducción durante la expansión de las válvulas aun es incierta

Tips and tricks

PRE TAVI

- Bloqueo de rama derecha pre existente
- Complejo valvular Ao Pequeño
- Hipertrofia septal severa
- Complejos valvular Ao severamente calcificado

DURING TAVI

- Profundidad del implante
- Dilataciones con balón menos agresivas
- O no usar balón?

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Tips and tricks

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 4, NO. 7, 2011

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DOI: 10.1016/j.jcin.2011.03.015

CVN Interview

Feasibility of Transcatheter Aortic Valve Implantation Without Balloon Pre-Dilation

A Pilot Study

Eberhard Grube, MD,* C
Eduardo Sousa, MD,‡ Os
Jose Mangione, MD,¶ Lu

Bonn and Essen, Germany;

Table 3. Clinical Short-Term Outcome

	Study Group (n = 60)	Control Group (n = 126)
All-cause mortality	6.7% (4)	14.3% (18)
Myocardial infarction	0	5.6% (7)
Stroke/TIA	5.0% (3)	11.9% (15)
Need for pacemaker implantation	11.7% (7)	27.8% (35)
Vascular access complication	10.0% (6)	9.5% (12)

Values are % (n).
TIA = transient ischemic attack.

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Tips and tricks

Post TAVI monitoring