Choosing the first TAVR

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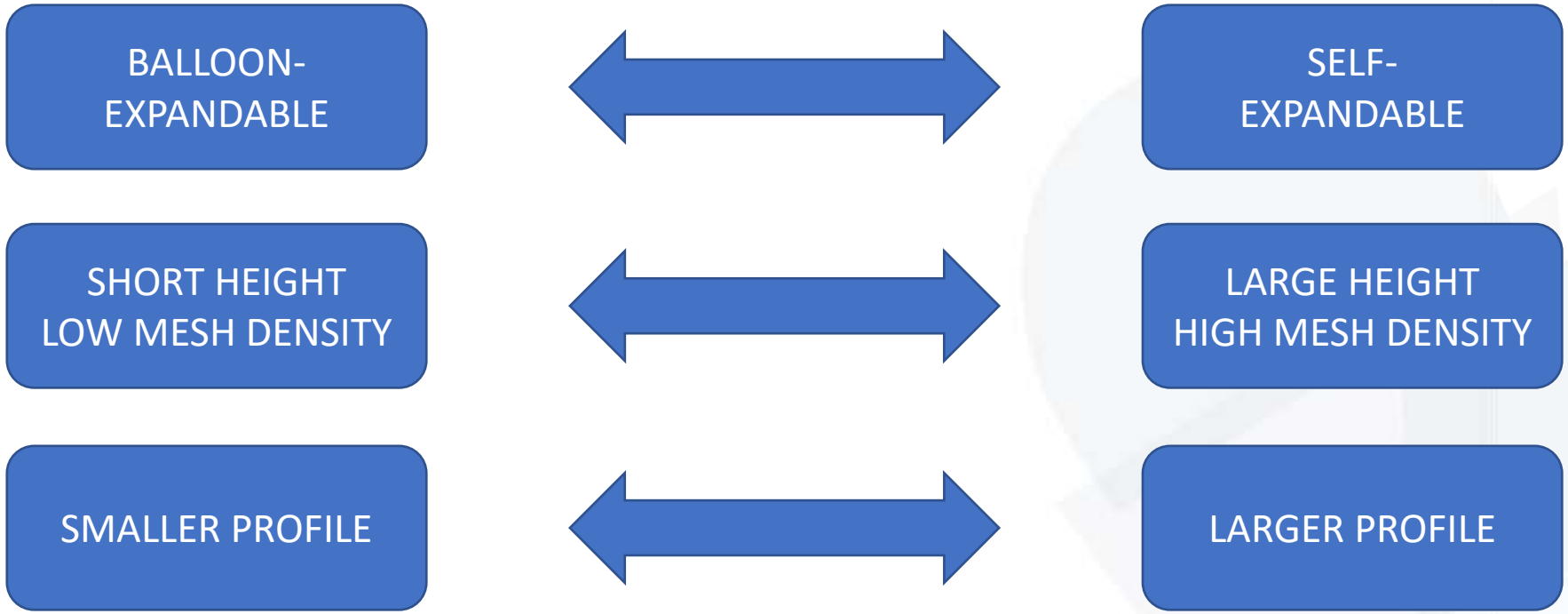
HCU – VALLADOLID, Spain

@ignamatsant

Different mechanisms



STRENGHTS / WEAKNESSES

MY OWN POINT OF VIEW

Experience

Coro.re-access

Evolut Pro+

C.Alignment

Aggresive pre-dilation

Acurate neo2

Hemodynamics

PPM rate

Navitor

Re-access

Slow recapture

Hydra

Pure AR

Small annuli

Jena V

Prize?

Experience

Venus APlus

Experience

Not on-balloon

Sapien-3U

On-balloon

Crossability

Myval

Crimped

Trackability

Vienna

Hemodynamics

Not-resheathable

Allegra

Motorized

Size

Vitaflow

icor

HC UV

AVOID RISKS

- LIFE THREATENING
- CONDUCTION DISTURBANCES
- DIFFICULT CORON.RE-ACCESS

GOOD HEMODYNAMICS:

- NO LEAK
- NO RESIDUAL GRADIENTS

icicar

AVOID RISKS

- LIFE THREATENING
- CONDUCTION DISTURBANCES
- DIFFICULT CORON.RE-ACCESS

Risk of coronary obstruction

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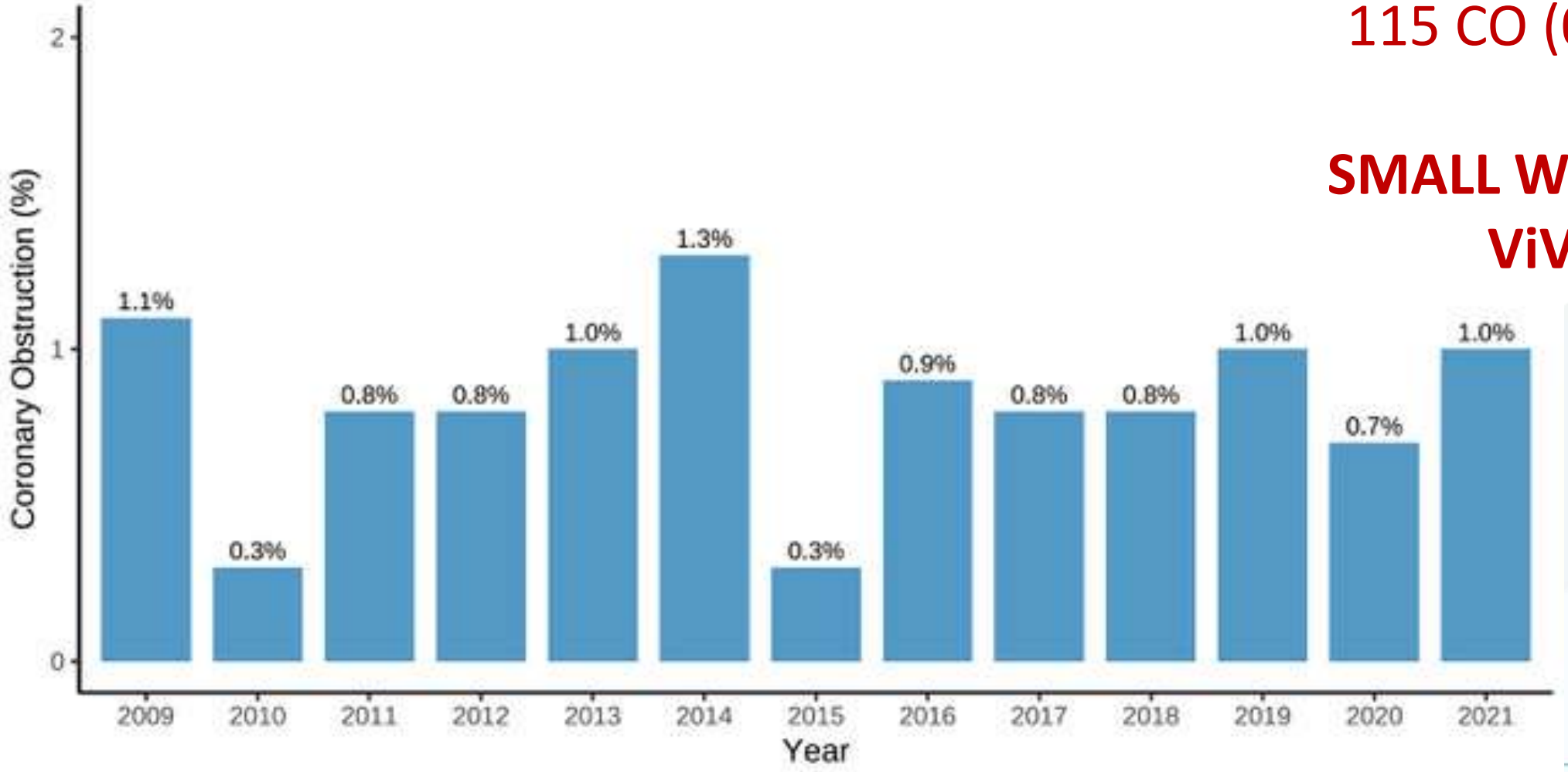
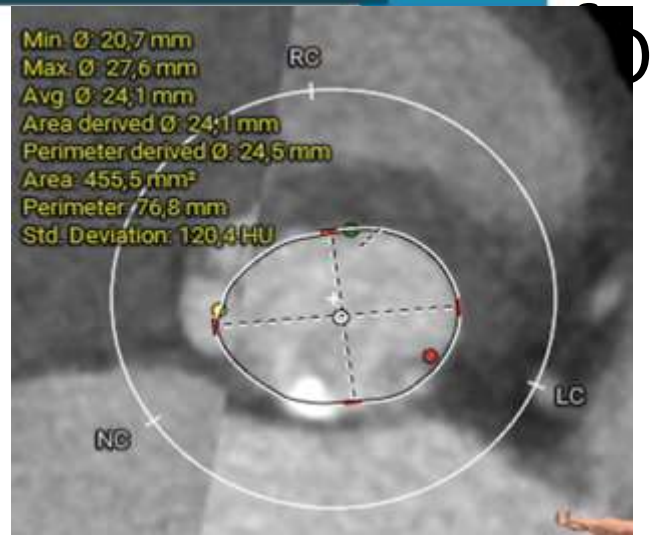
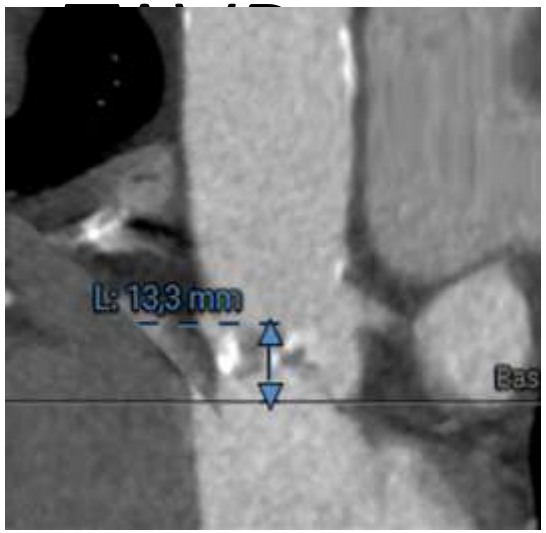
13.675 TAVI,
115 CO (0.8%)

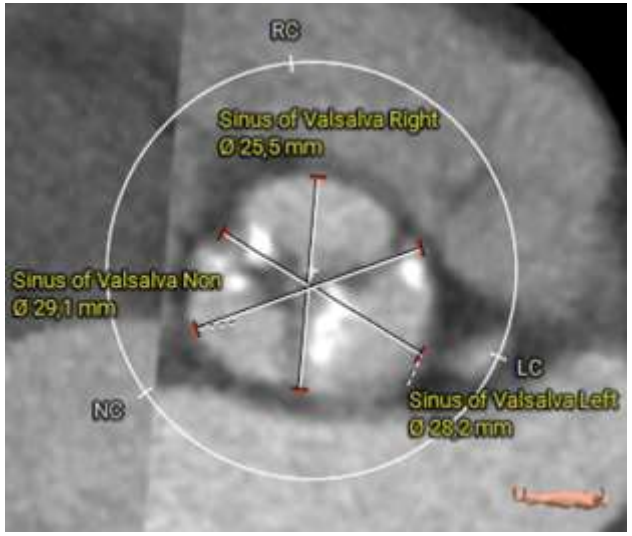
SMALL WOMEN
ViV

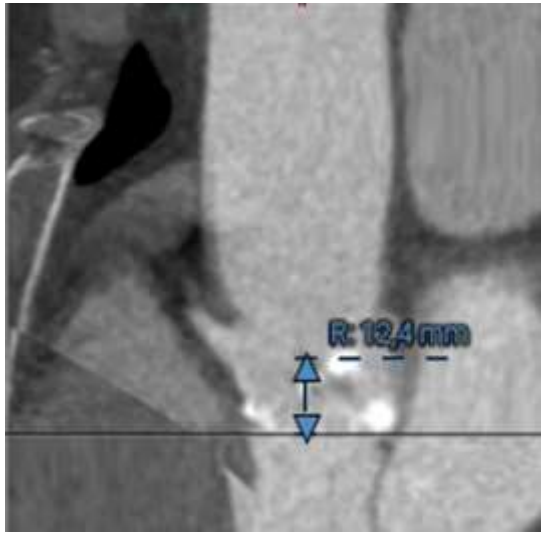


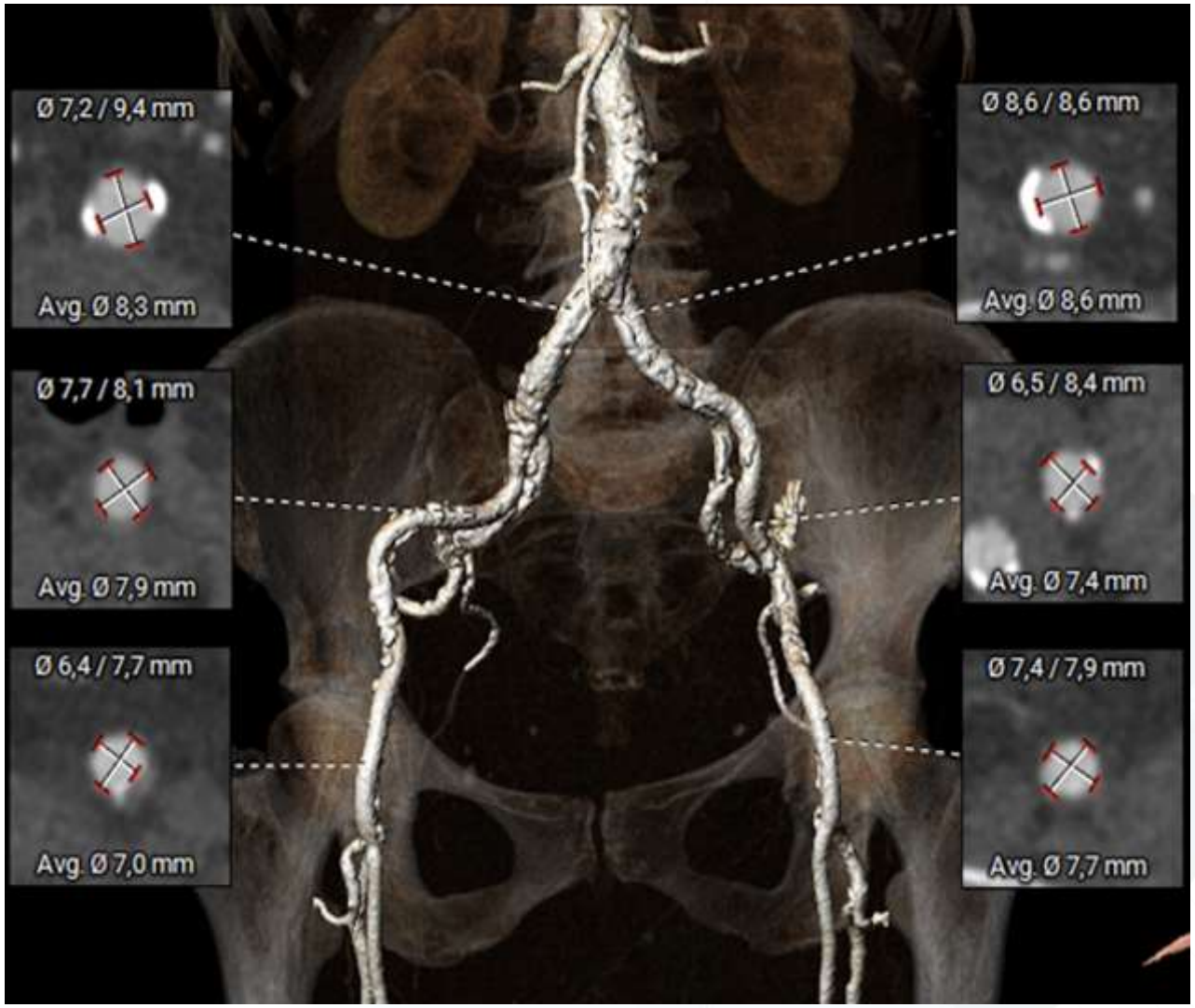
Ojeda et al. JACC Cardiovasc Interv 2023

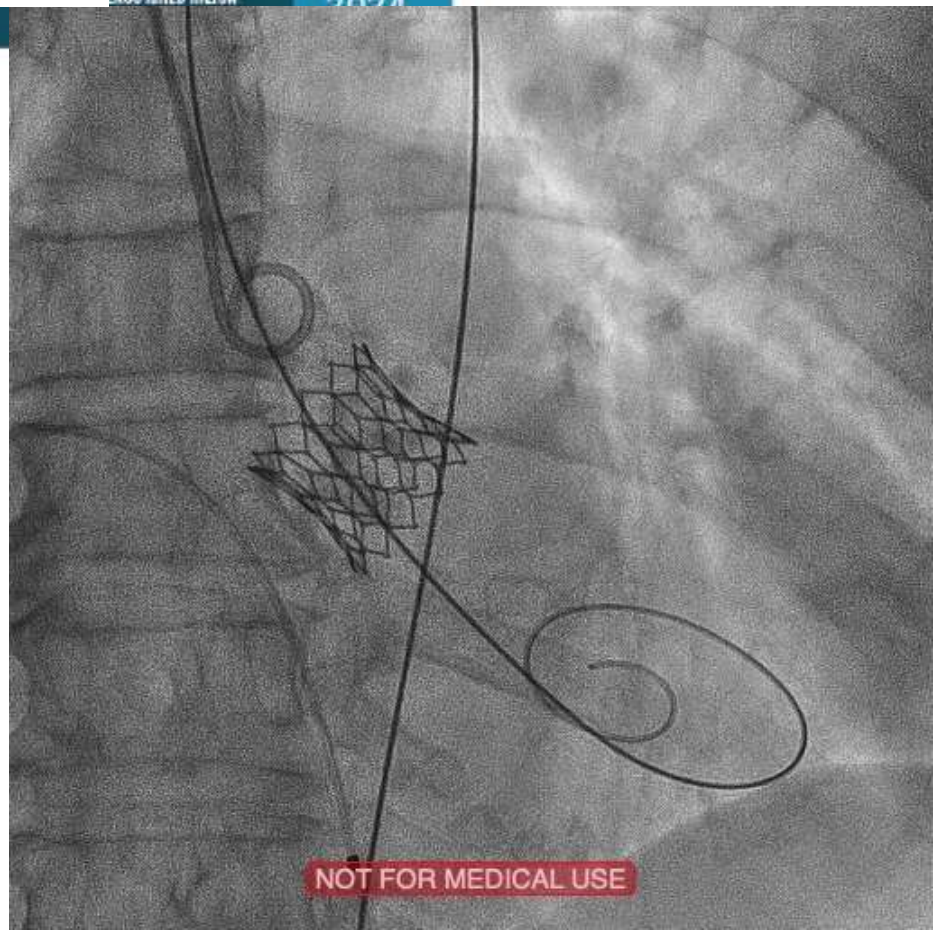

Min. Ø: 20,7 mm
Max. Ø: 27,6 mm
Avg. Ø: 24,1 mm
Area derived Ø: 24,1 mm
Perimeter derived Ø: 24,5 mm
Area: 455,5 mm²
Perimeter: 76,8 mm
Std. Deviation: 120,4 HU
RC
LC
NC


L: 13,3 mm

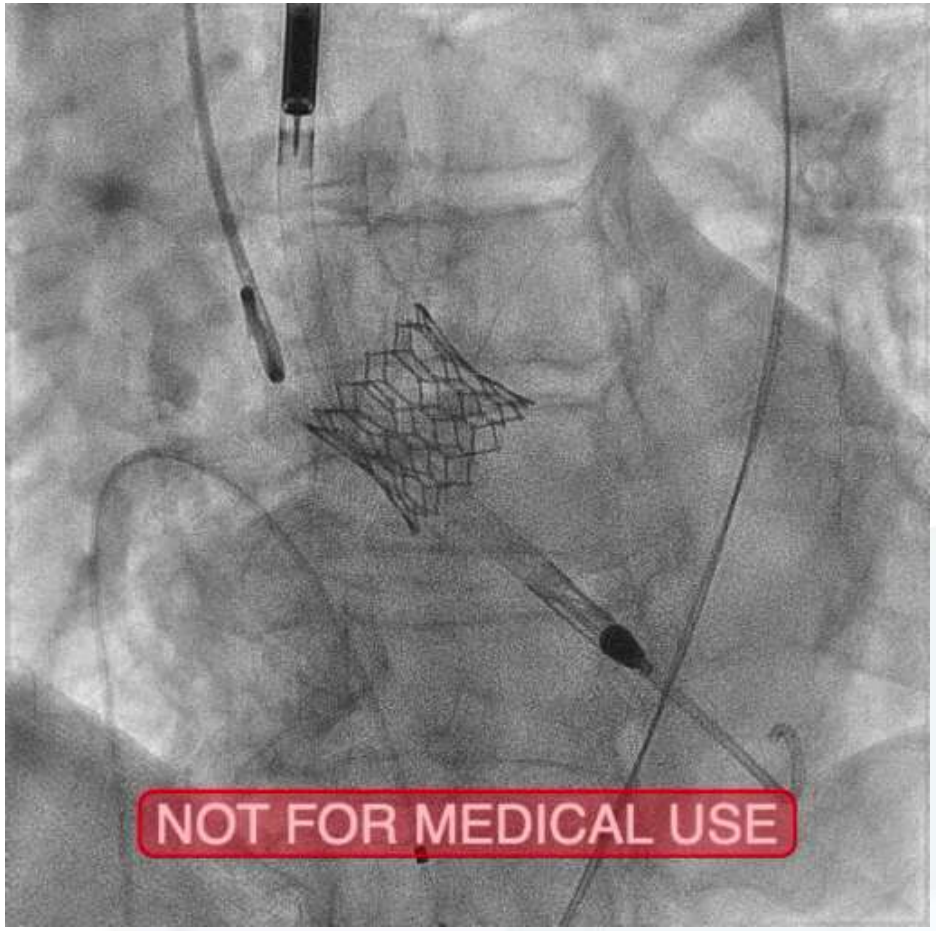

RC
Sinus of Valsalva Right
Ø 25,5 mm
Sinus of Valsalva Non
Ø 29,1 mm
LC
NC
Sinus of Valsalva Left
Ø 28,2 mm


R: 12,4 mm

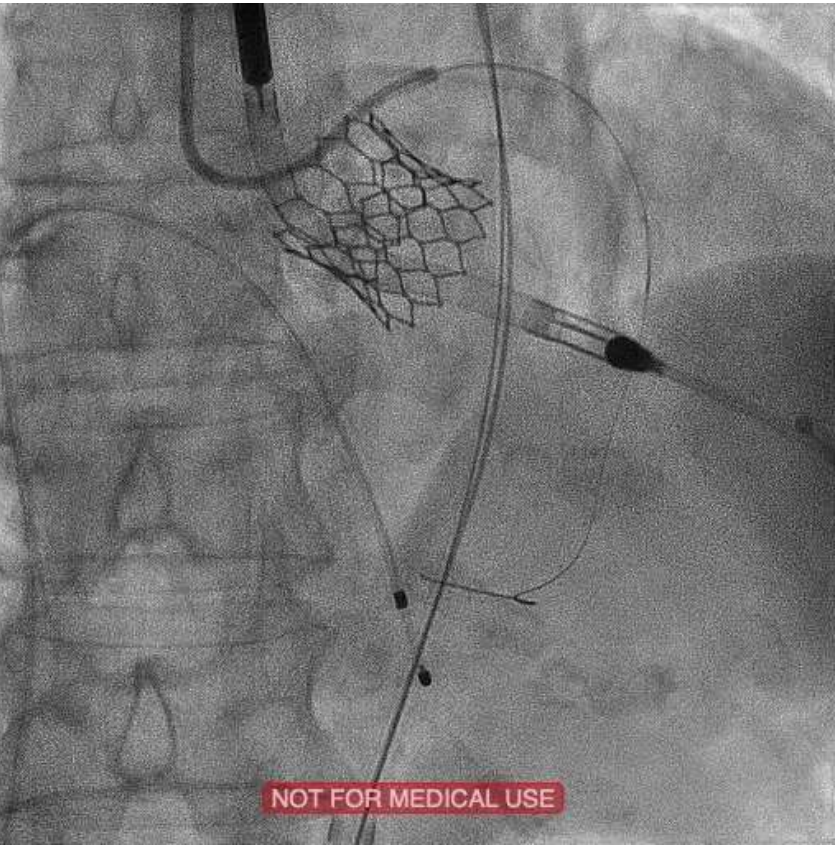

Ø 7,2 / 9,4 mm
Avg. Ø 8,3 mm
Ø 8,6 / 8,6 mm
Avg. Ø 8,6 mm
Ø 7,7 / 8,1 mm
Avg. Ø 7,9 mm
Ø 6,5 / 8,4 mm
Avg. Ø 7,4 mm
Ø 6,4 / 7,7 mm
Avg. Ø 7,0 mm
Ø 7,4 / 7,9 mm
Avg. Ø 7,7 mm

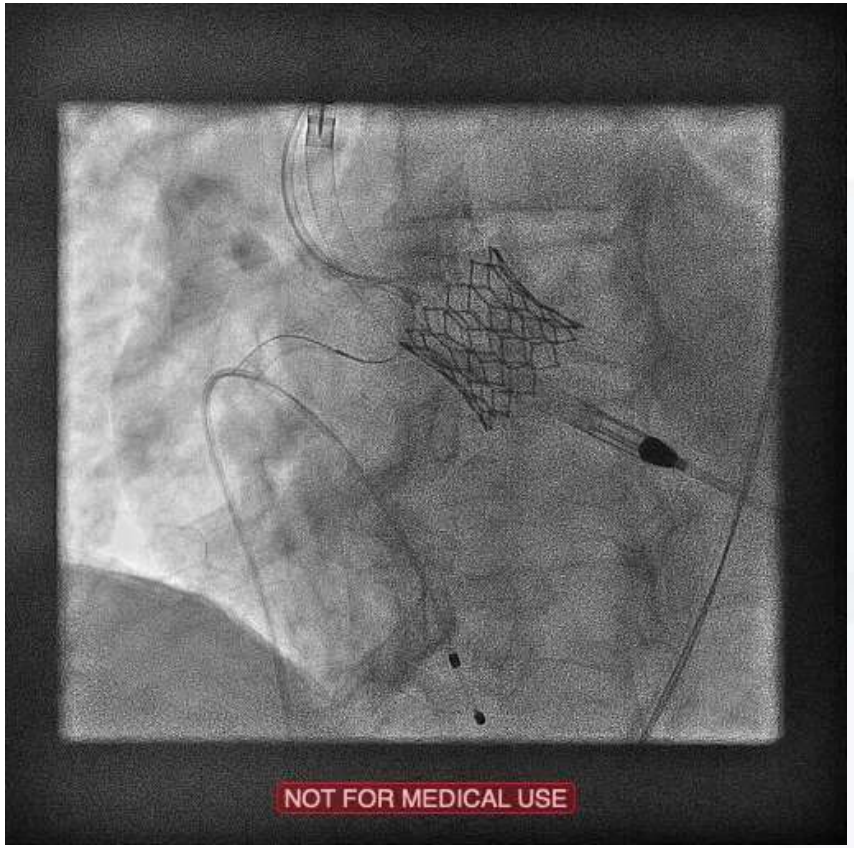


Immediately after, the patient developed anginal chest pain and hemodynamic instability. The aortography demonstrated the absence of filling of the RCA.

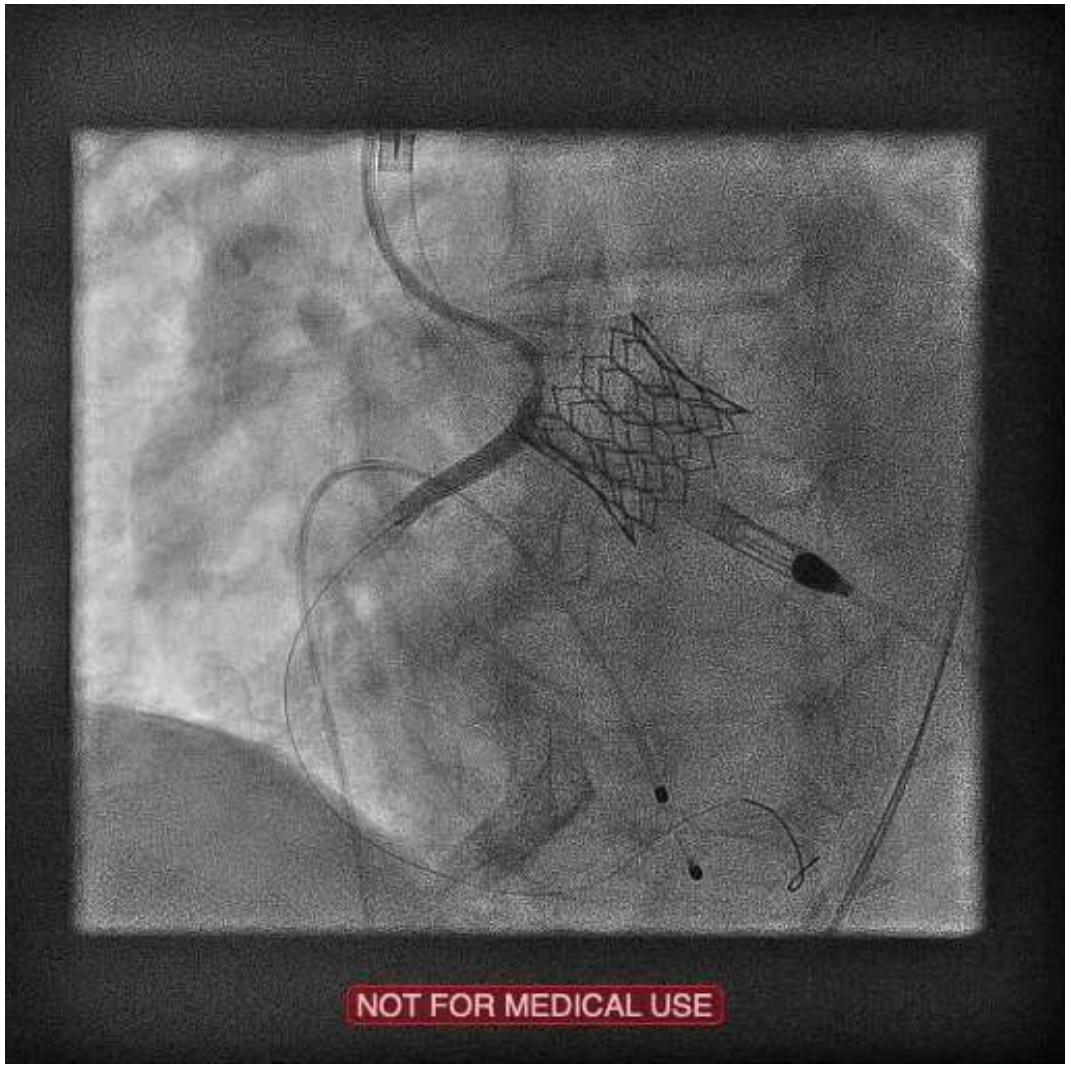


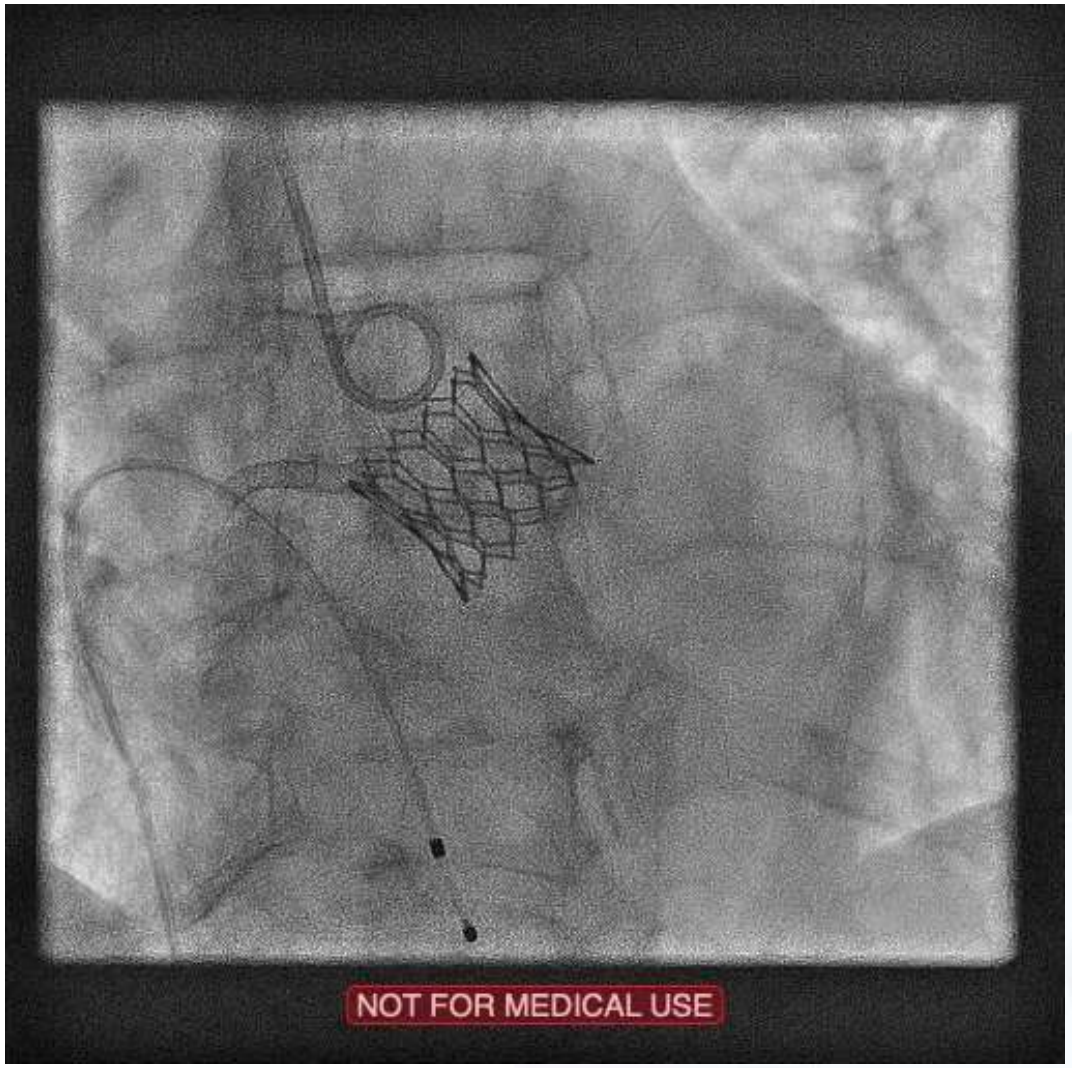
Therefore, the patient was emergently intubated and hemodynamic support was started with vasopressors and percutaneous insertion of an Impella CP.

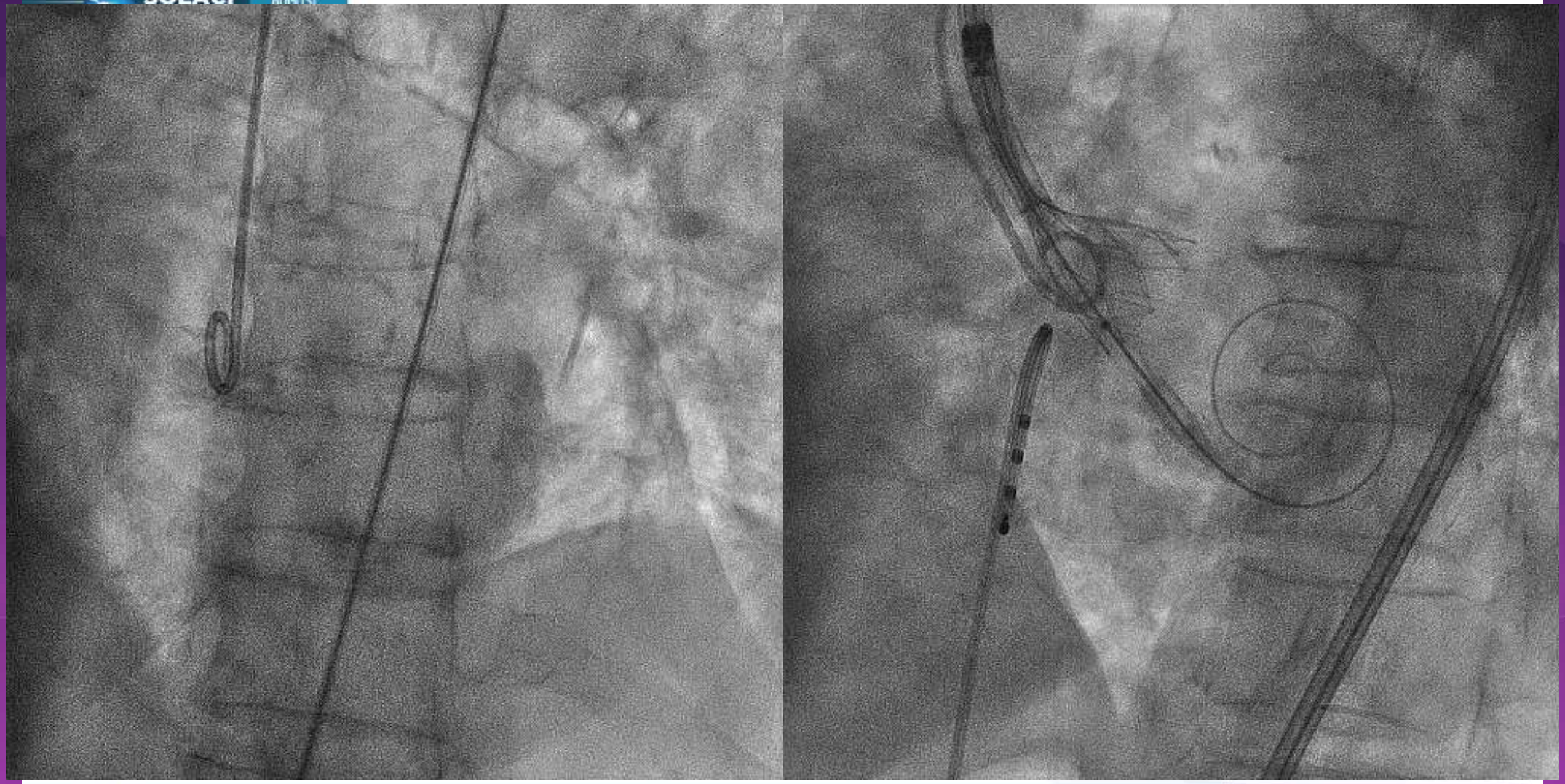

NOT FOR MEDICAL USE

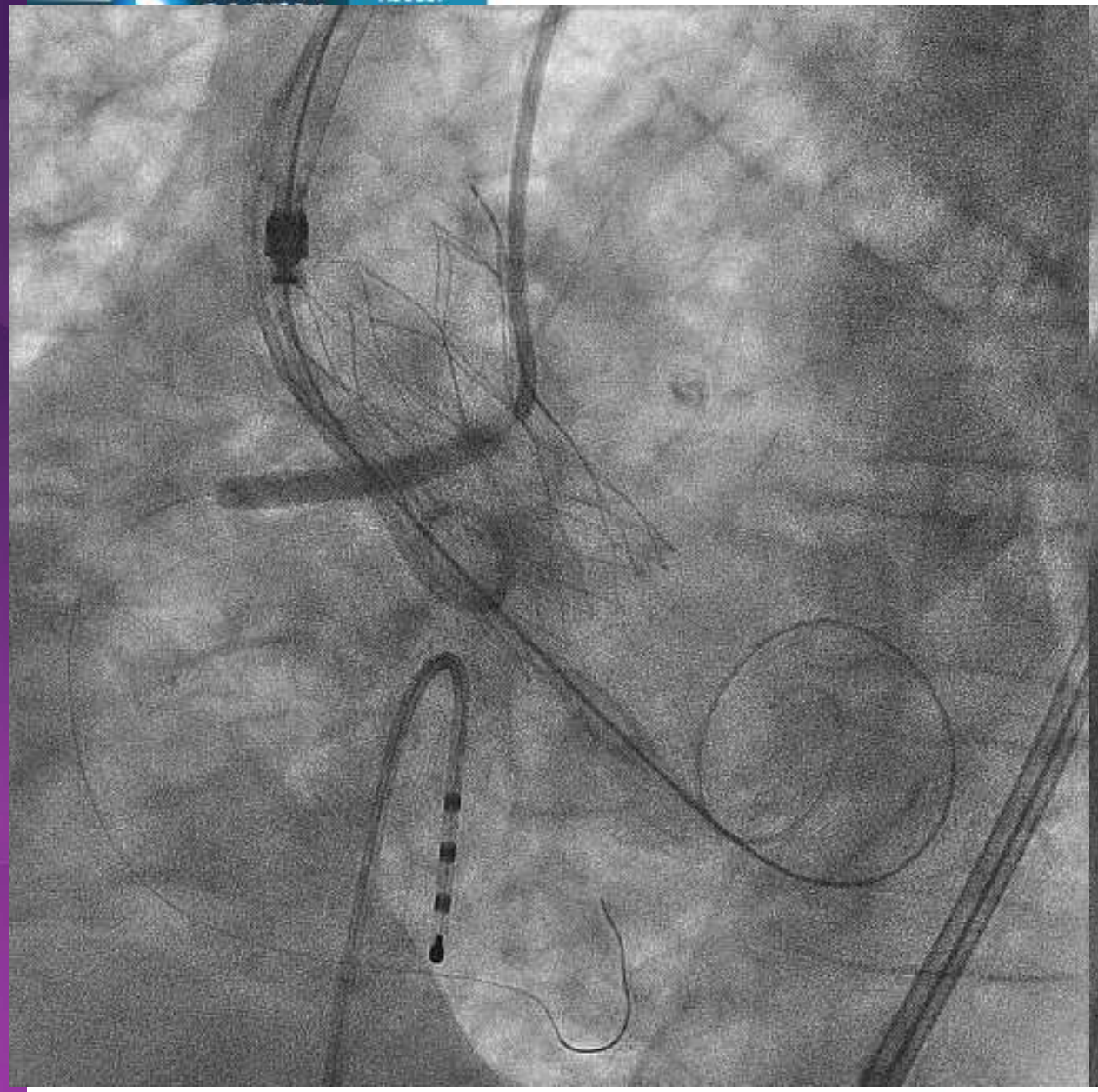

NOT FOR MEDICAL USE

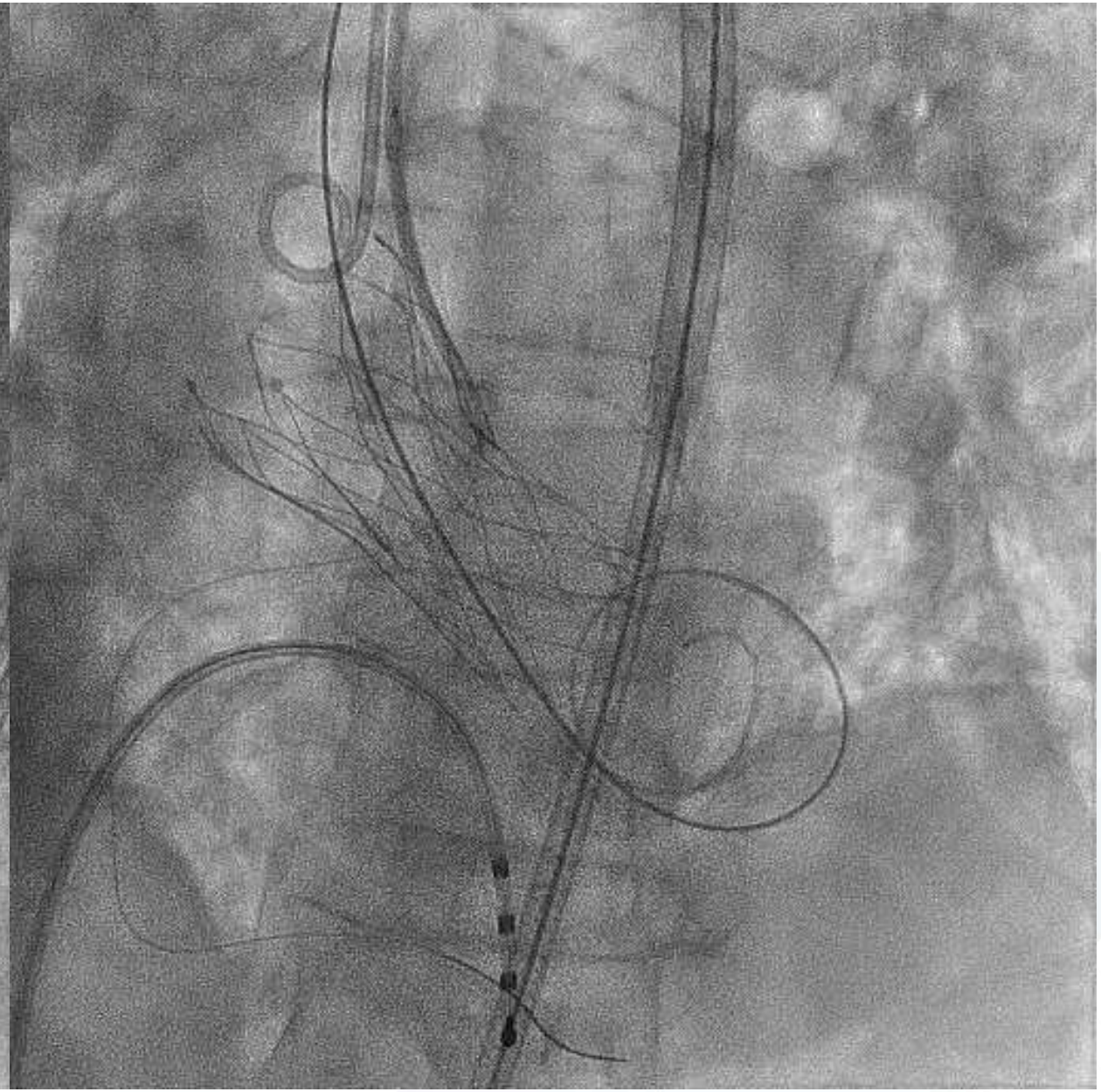

NOT FOR MEDICAL USE


NOT FOR MEDICAL USE


NOT FOR MEDICAL USE







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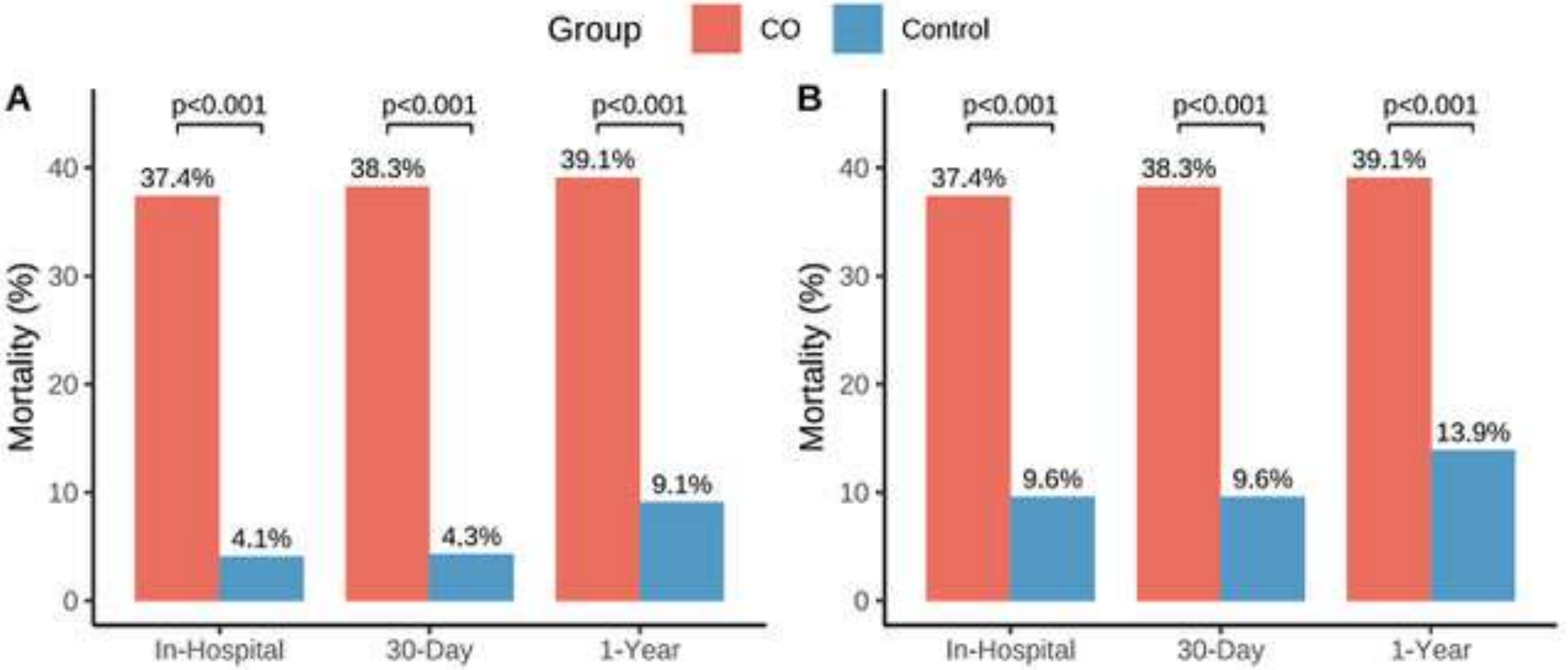
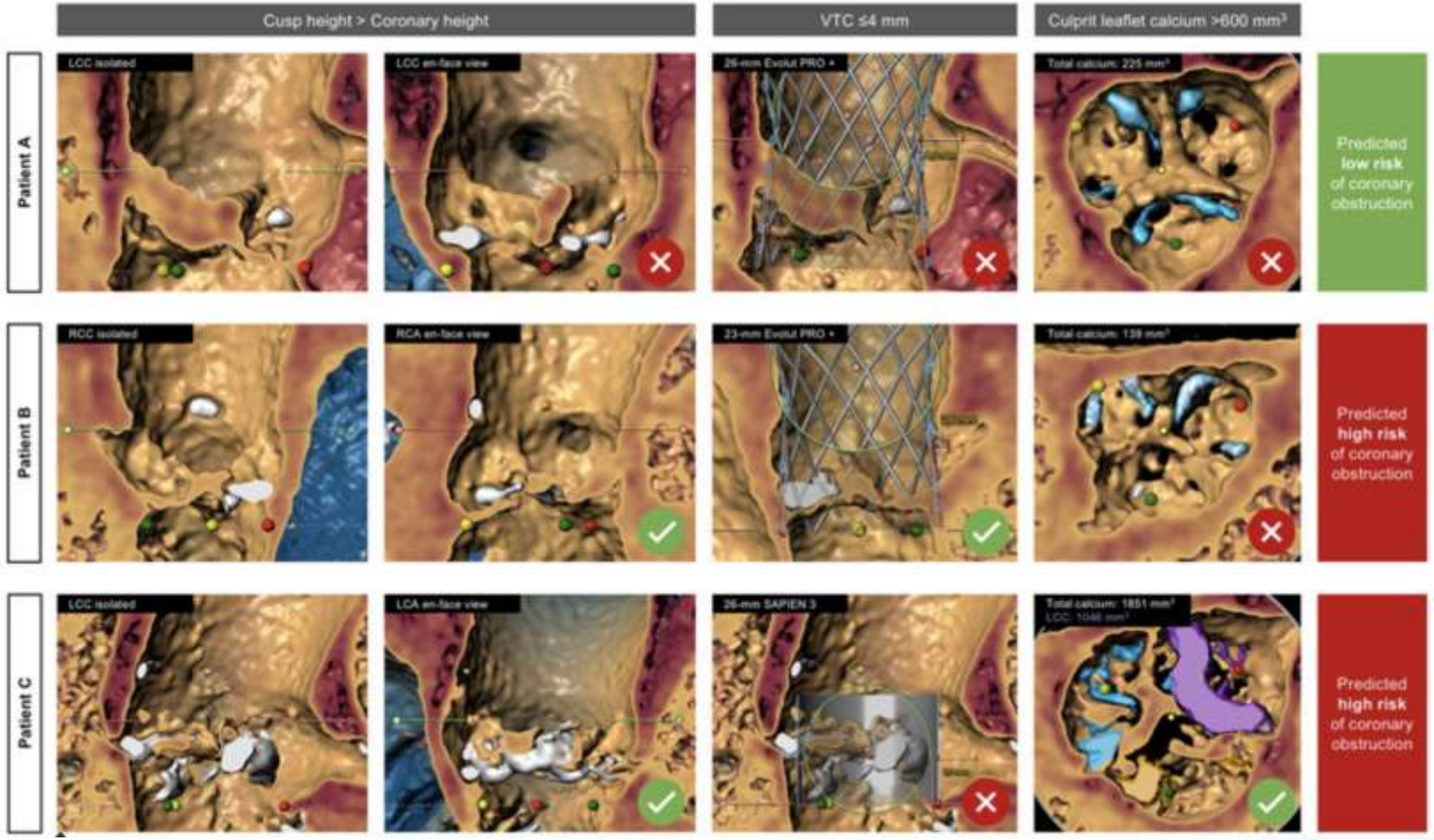
Features of CO

- **Valve-in-valve** (21.7% vs 3.1%; p= 0.001).
- Coronary **protection was performed in 21 (18.2%)** patients, only with a coronary guidewire in 15 (71.4%) of them and with an undeployed stent in the remaining 6 (28.6%) patients.
- CO **prediction was not precise**, especially in native valves
- In fact, almost the **half of the patients** NO factor of CO in CT



Ojeda et al. JACC Cardiovasc Interv 2023

Score predicting CO



Cusp > Coronary height

Prosthesis to CO > 4mm

Calcium of the leaflet

Khan et al. JACC Cardiovasc Interv 2023

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Mitigationg risk CO

- Coronary obstruction **more common after BE-TAVI** than a SE-TAVI (VIVID registry)
- **Inability to reposition or retrieve** BE-TAVI
- The **Acurate neo device** has an upper crown that caps the native leaflets below the coronary ostia, probably the lowest rate of CO


Evolut Pro+


Vienna


Navitor


Acurate neo2


Allegra


Vitaflow

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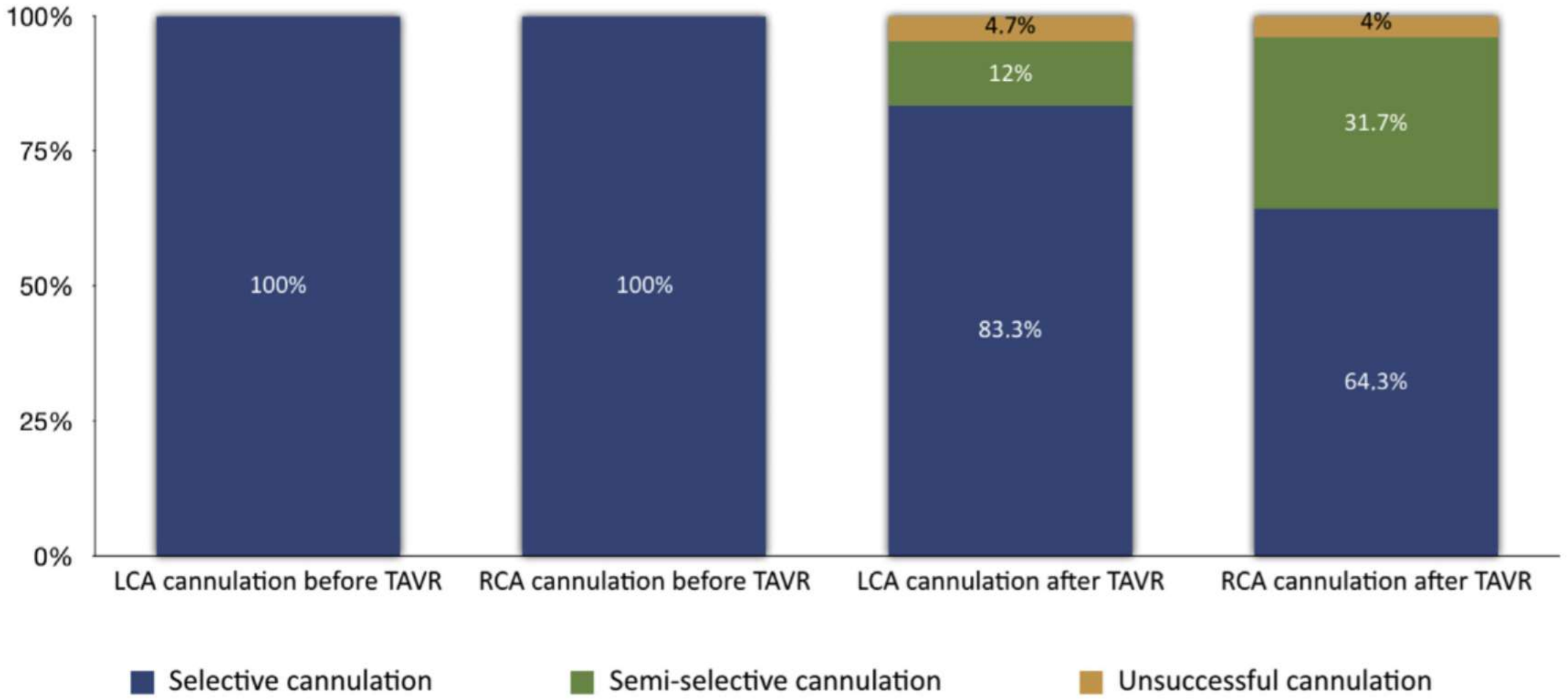
Preservation of coronary access

- High prevalence of CAD in TAVI patients
- Possible need for re-access
- **Key:** TAVI valve that allows easy coronary access
- **Principal factors determining ease of coronary Access:**
  - Frame height
  - Frame mesh density.

- **BE-TAVI** usually extend above the coronary ostia, but they have a low-density mesh and large cells
- **Acurate neo** valve has a short stent that usually sits below the ostia



Barbanti et al. RE-ACCESS

Theoretical basis of “patient-tailored” alignment

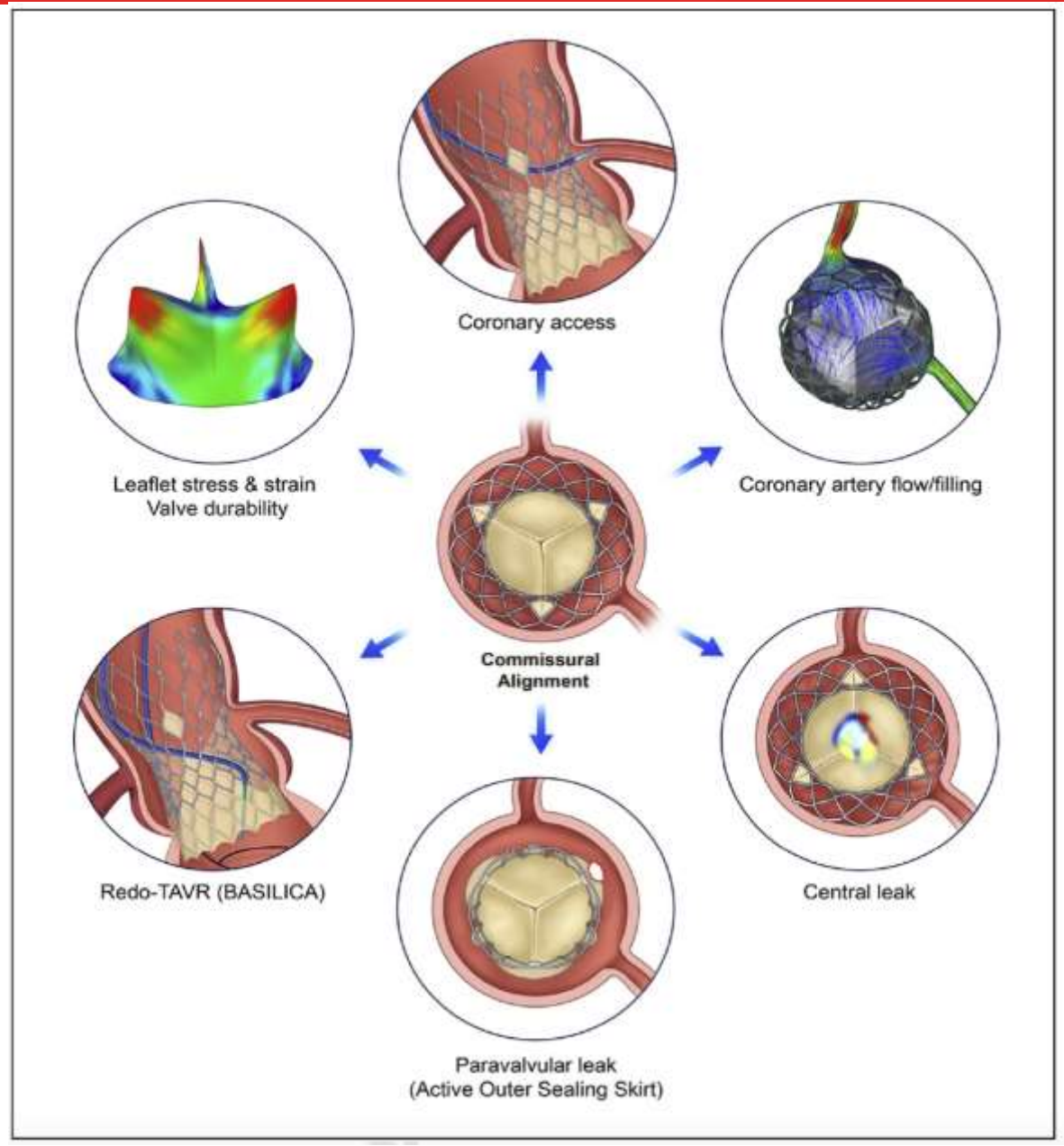
First publication on “patient-tailored” alignment

- Spanish Journal of Cardiology

Accurate commissural alignment during ACURATE neo TAVI procedure. Proof of concept

Alineamiento comisural preciso durante el TAVI con ACURATE neo. Prueba de concepto

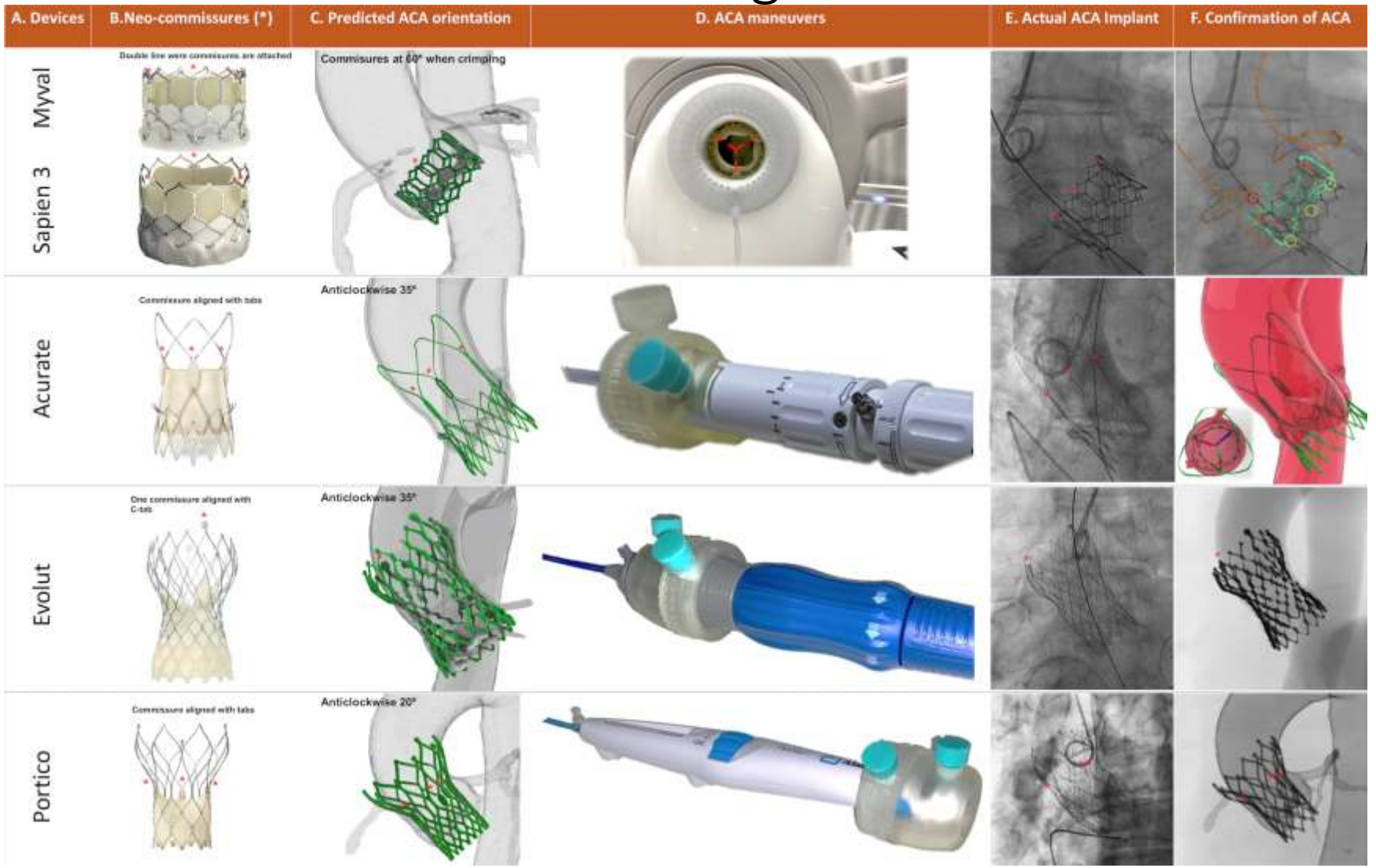
Alfredo Redondo[a,b,◊], Félix Valencia-Serrano[c,◊], Sandra Santos-Martínez[a,b], José Raúl Delgado-Arana[a,b], Alejandro Barrero[a,b], Ana Serrador[a,b], Hipólito Gutiérrez[a,b], Israel Sánchez-Lite[d], Teresa Sevilla[a,b], Ana Revilla[a,b], Carlos Baladrón[a,b], Won-Keun Kim[e], Manuel Carrasco-Moraleja[a,b], J. Alberto San Román[a,b], Ignacio J. Amat-Santos[a,]



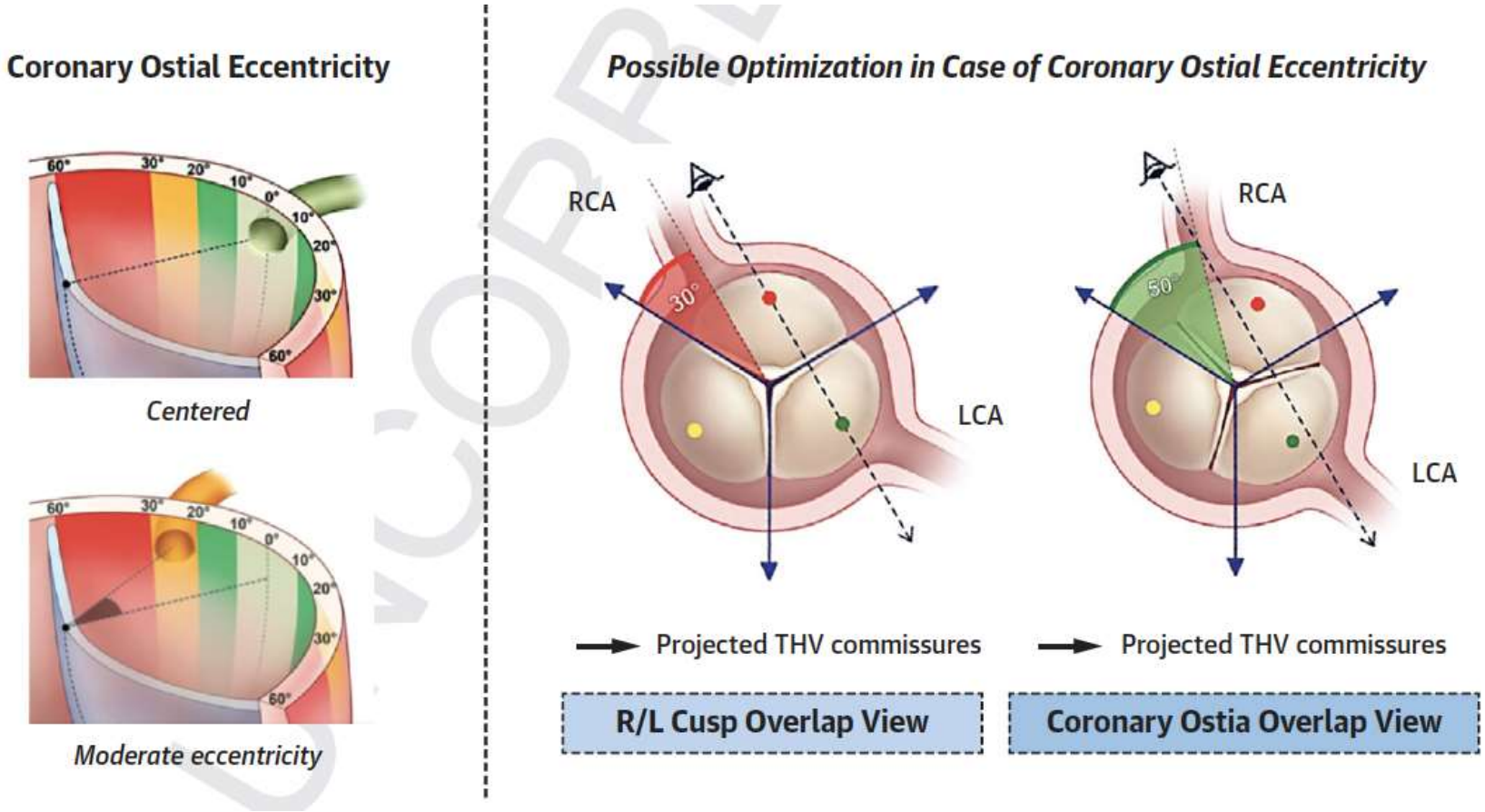
JACC INTV 2022. Tang G, Amat-Santos, et al

Feasible of “patient-tailored” commissural alignment with all devices

- “ACA device”



First doubts on the “perfect efficacy” of this strategy



JACC INTV 2022. Amat-Santos, et al

First publication on commissural alignment

Commissural Versus Coronary Optimized Alignment During Transcatheter Aortic Valve Replacement

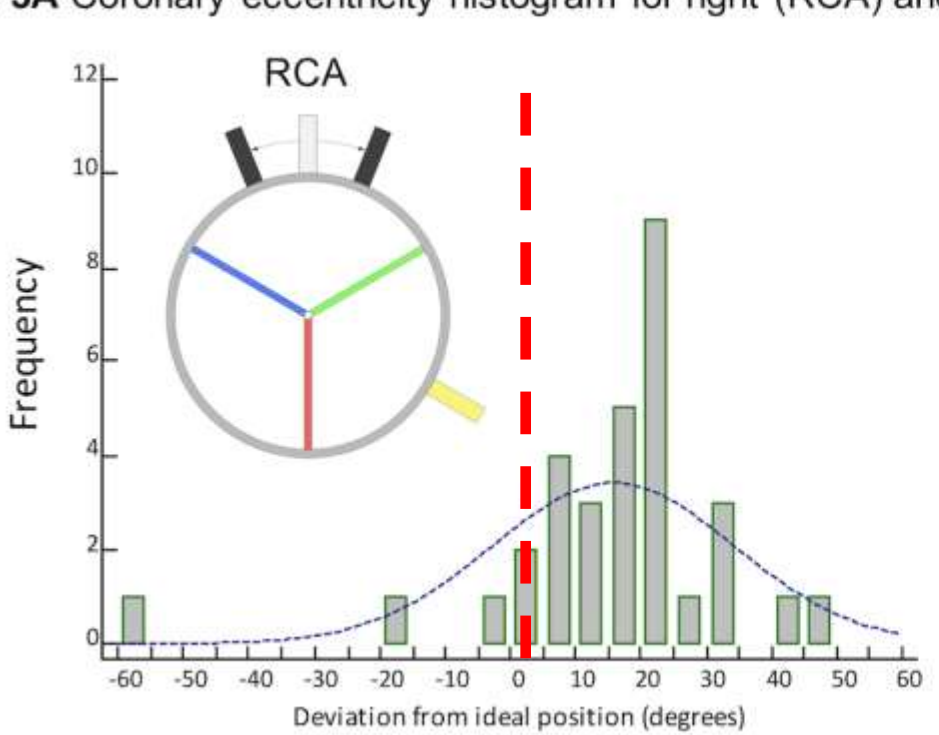
Alfredo Redondo, MD,[a] Carlos Baladrón Zorita, ENG, PHD,[a] Didier Tchétché, MD,[b] Sandra Santos-Martinez, MD,[a] Jose Raúl Delgado-Arana, MD,[a] Alejandro Barrero, MD,[a] Hipólito Gutiérrez, MD,[a] Ana Serrador Frutos, MD,[a] Cristina Ybarra Falcón, MD,[a] Mario García Gómez, MD, PHD,[a] Manuel Carrasco Moraleja, MSC,[a] Teresa Sevilla, MD, PHD,[a] Israel Sanchez Lite, MD,[c] Esther Sanz, RN,[a] J. Alberto San Román, MD, PHD,[a] Ignacio J. Amat-Santos, MD, PHD[a]

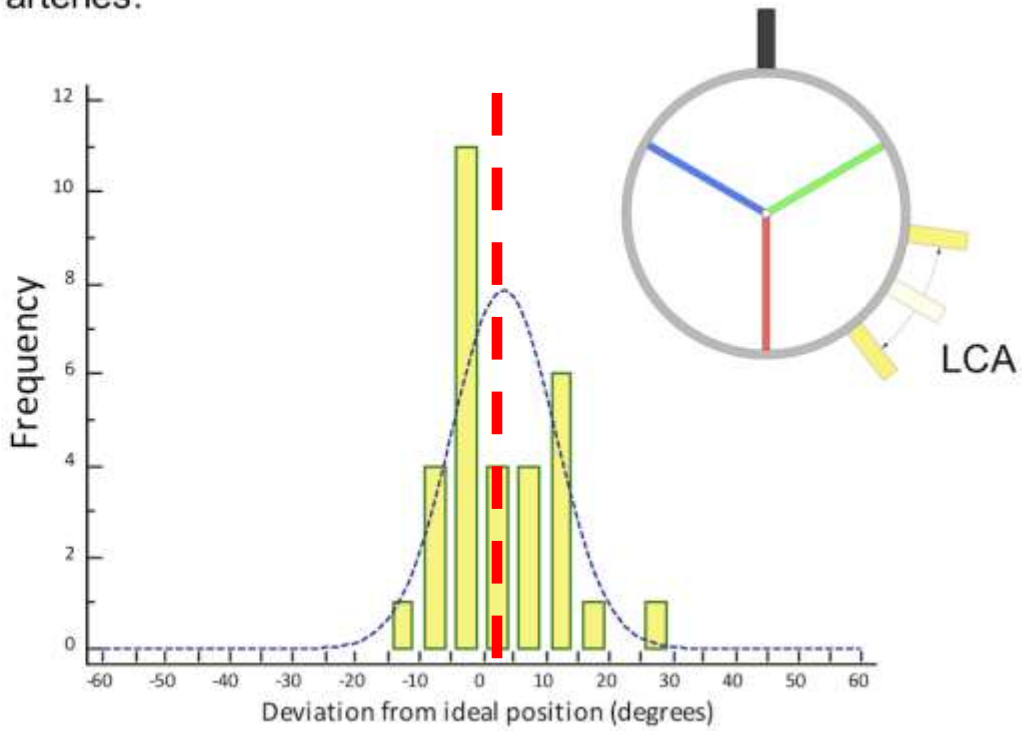
JACC INTV 2022. Amat-Santos, et al

How often are coronary ostial “eccentric”

- Variability of coronary ostia

Figure 3A Coronary eccentricity histogram for right (RCA) and left (LCA) coronary arteries.

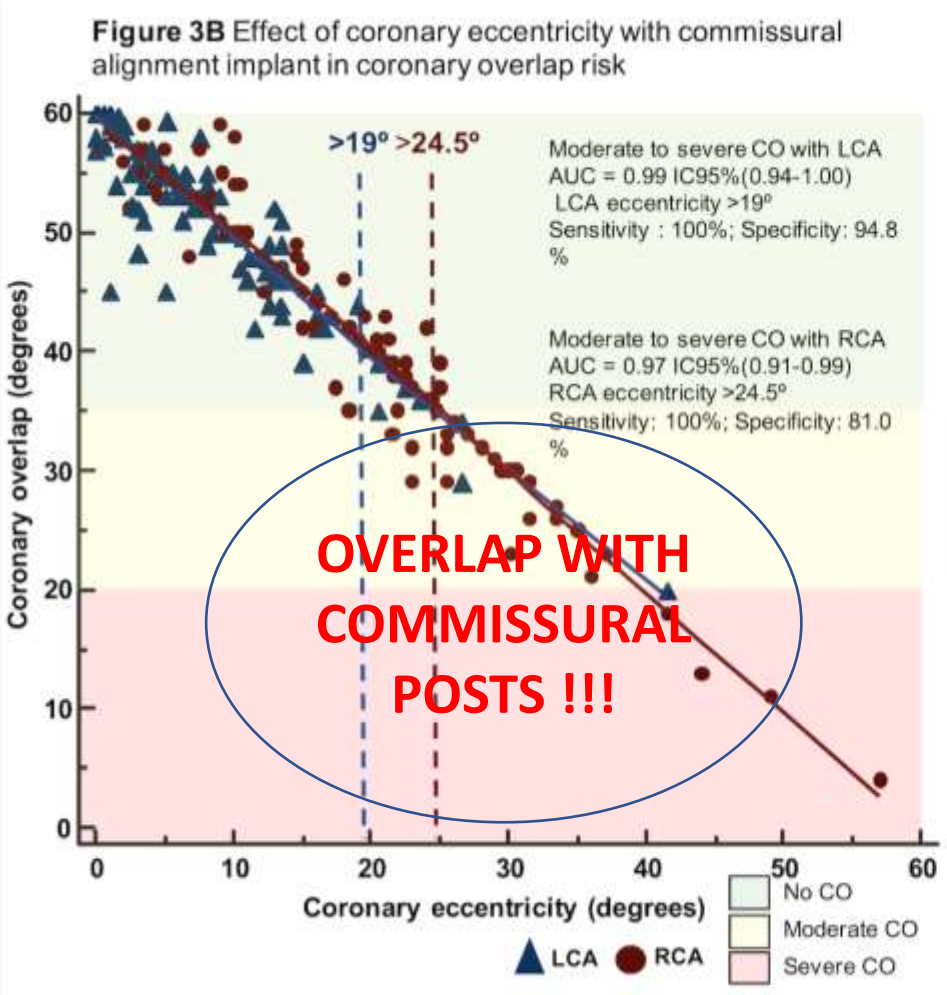


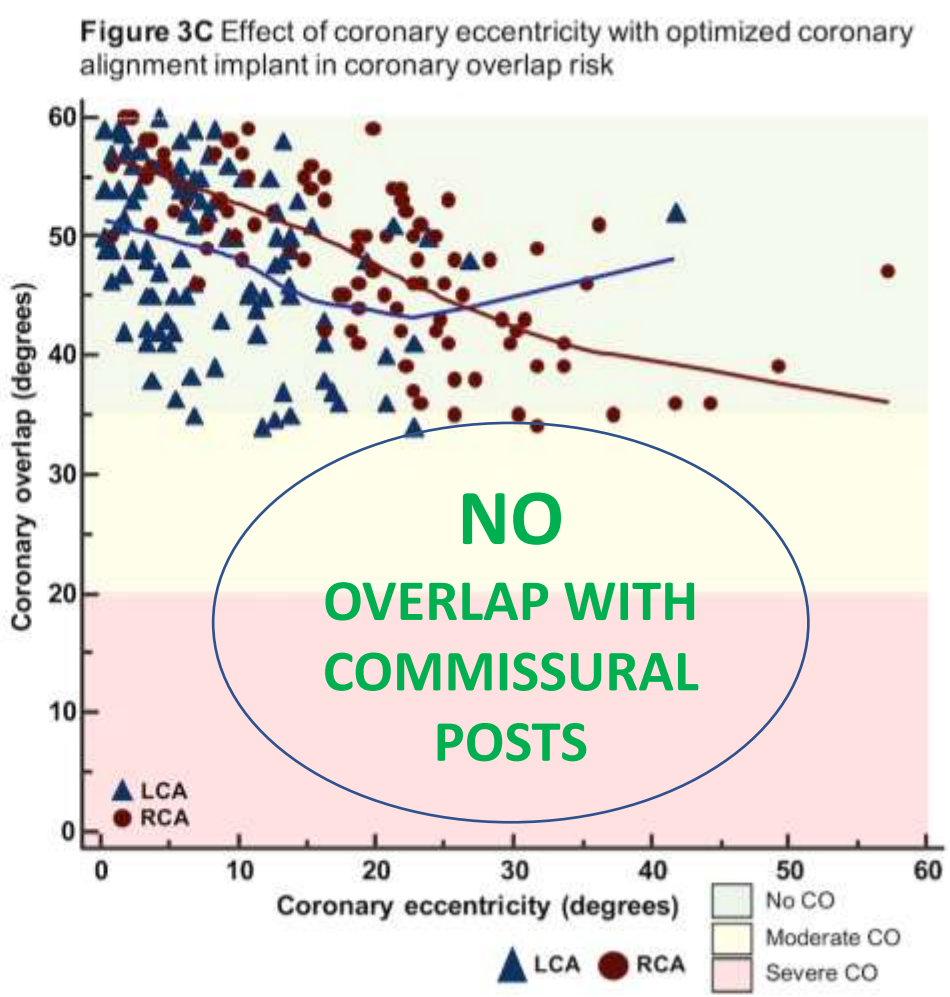


JACC INTV 2022. Amat-Santos, et al

How often are coronary ostial “eccentric”

- Variability of coronary ostia





JACC INTV 2022. Amat-Santos, et al

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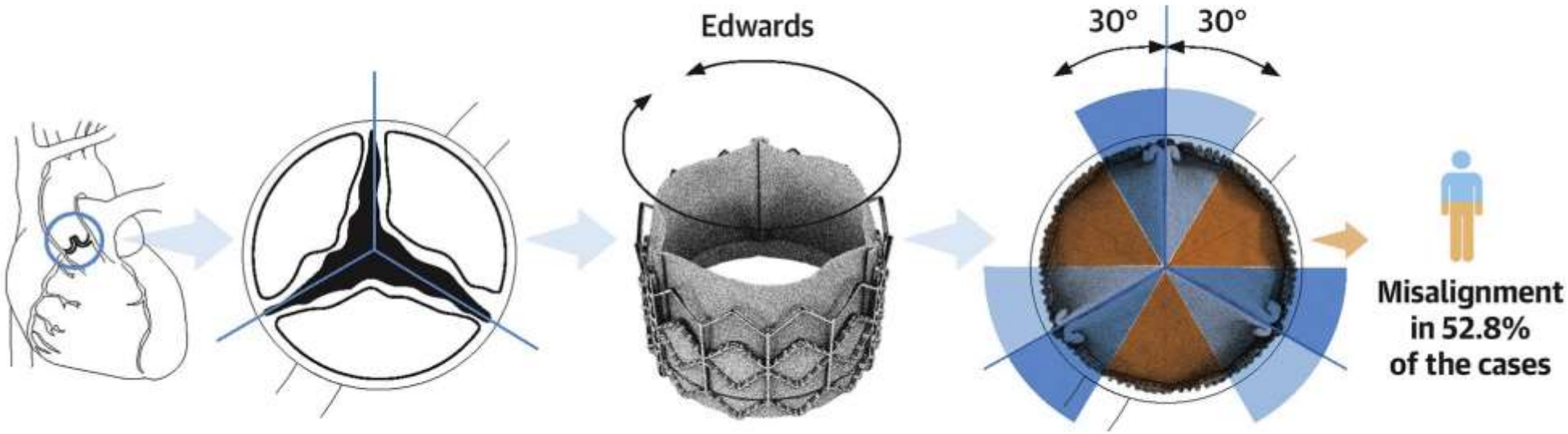
GOOD HEMODYNAMICS:

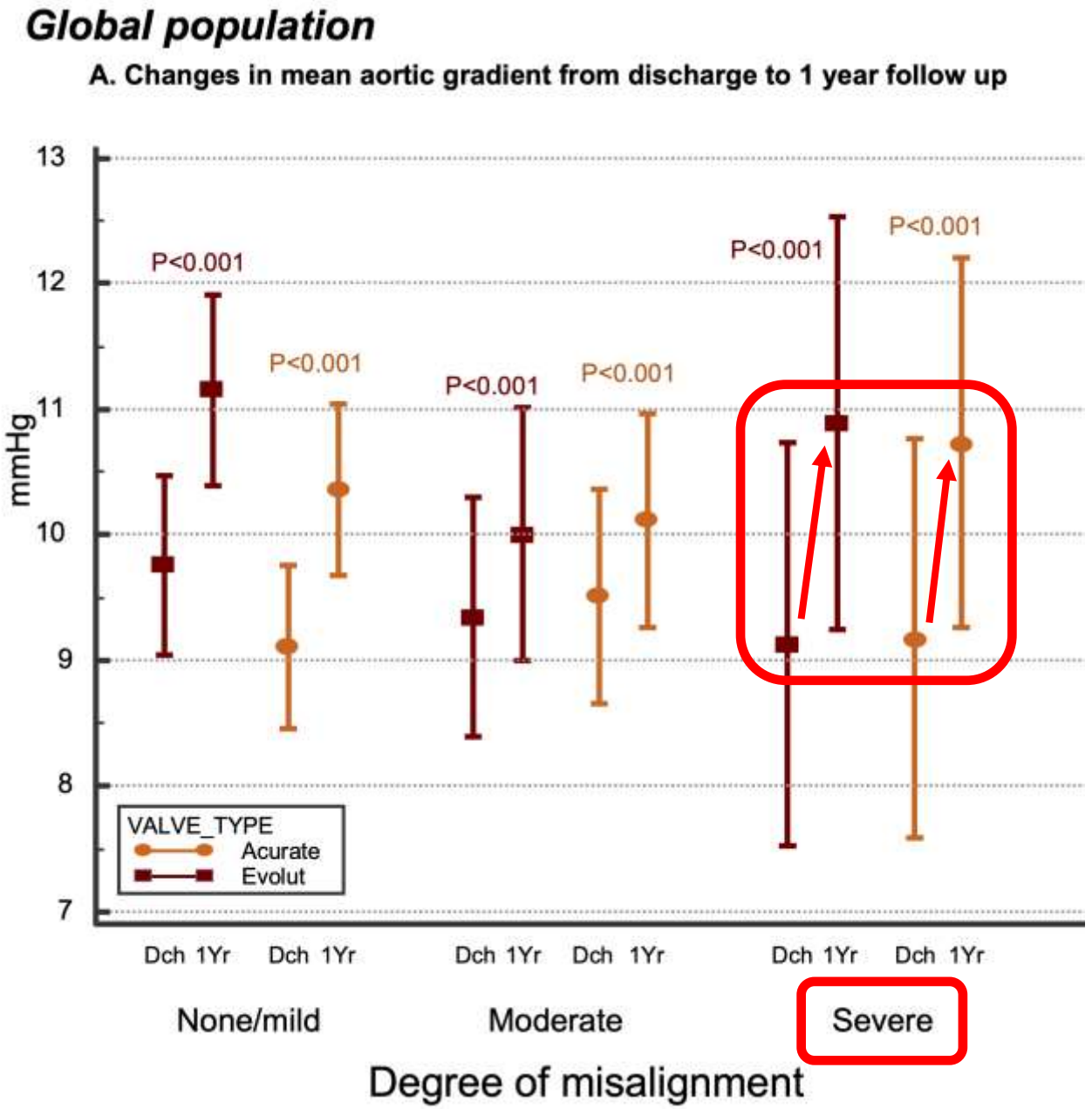
- NO LEAK
- NO RESIDUAL GRADIENTS

CENTRAL ILLUSTRATION: Main Outcomes of Aligned Versus Misaligned Balloon-Expandable Transcatheter Aortic Valve Replacement (N = 324)



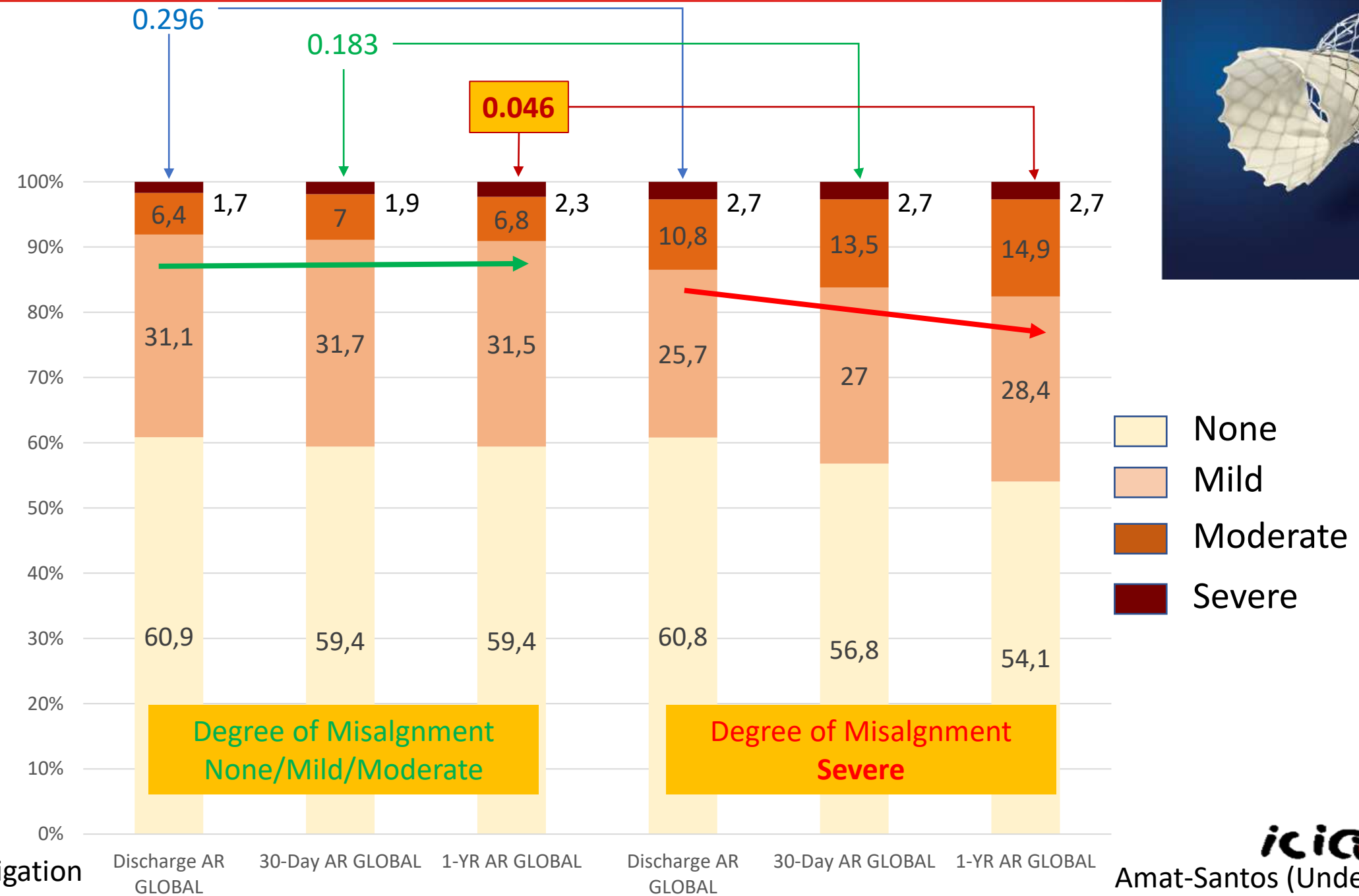
Outcome	Aligned (n = 153)	Misaligned (n = 171)	Odds Ratio [95% CI]
VARC-2 Early Safety	98.5%	94.3%	0.27 [0.04-1.10]
Aortic regurgitation > mild	3.6%	5.7%	1.55 [0.44-6.36]
Residual gradient (>20 mm Hg)	7.2%	7.4%	1.02 [0.37-2.86]
Relative AV gradient increase	8.3%	17.6%	2.35 [1.05-5.69]

Raschpichler M, et al. J Am Coll Cardiol Intv. 2022;15(11):1126-1136.



Amat-Santos (Under review)

AORTIC GRADIENTS



Under investigation

Amat-Santos (Under review)

Risk of annular ruputre

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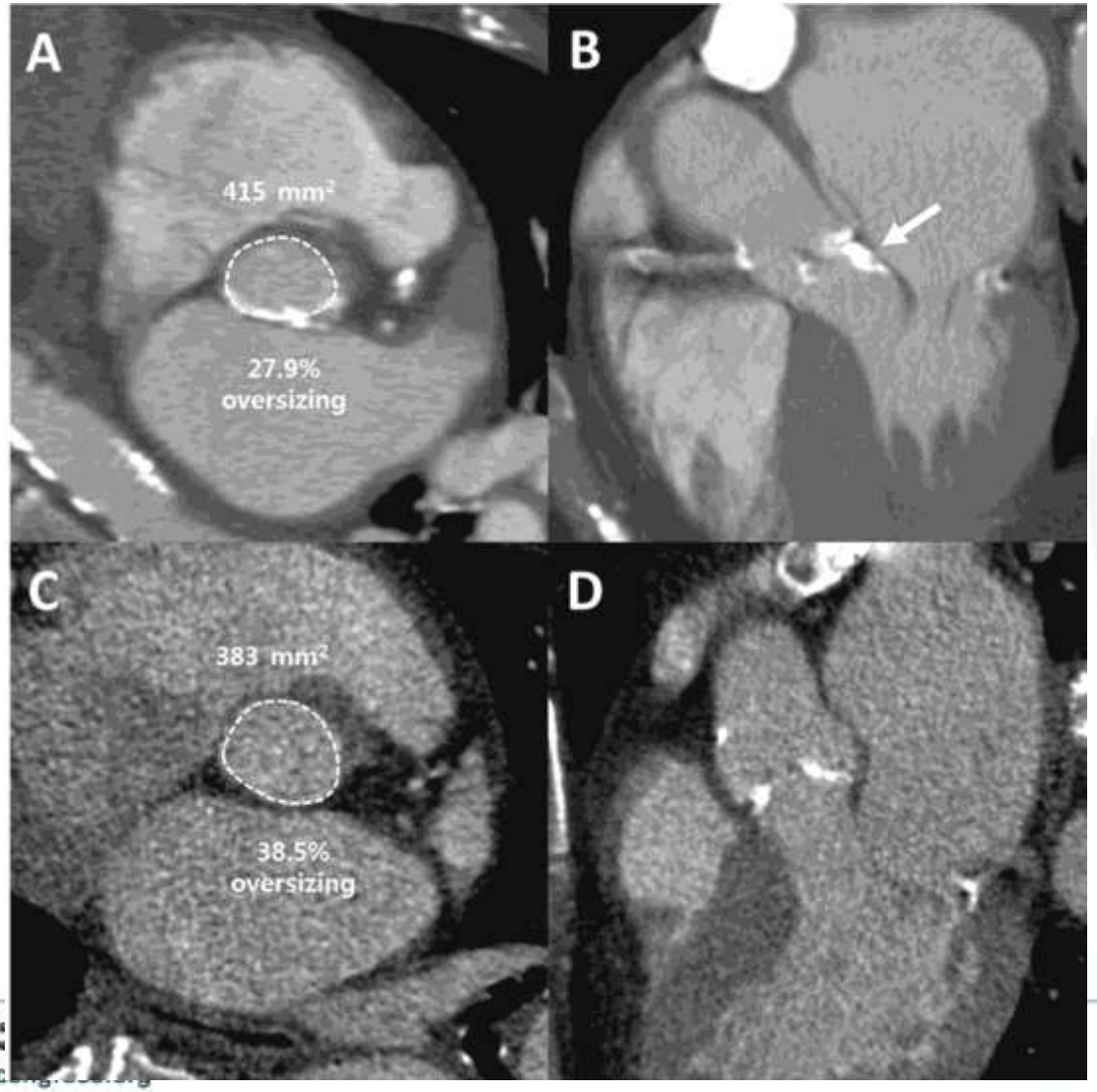


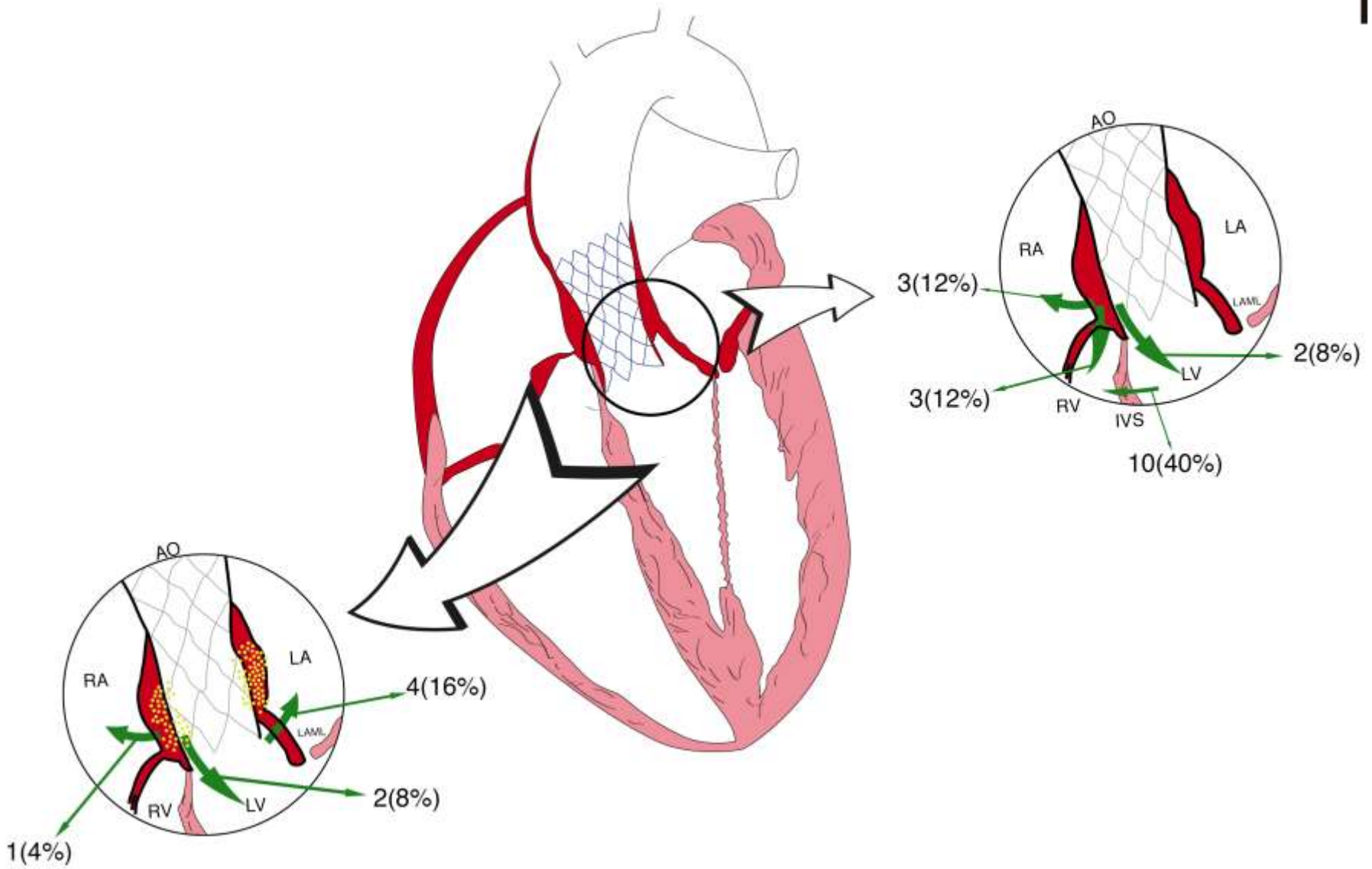
CALCIFICATION

OVER-SIZING

POST-DILATION

BE-TAVI
UNDER-SIZED

Barbanti et al. Circulation 2013



Amat-Santos et al. Eurointervention 2018

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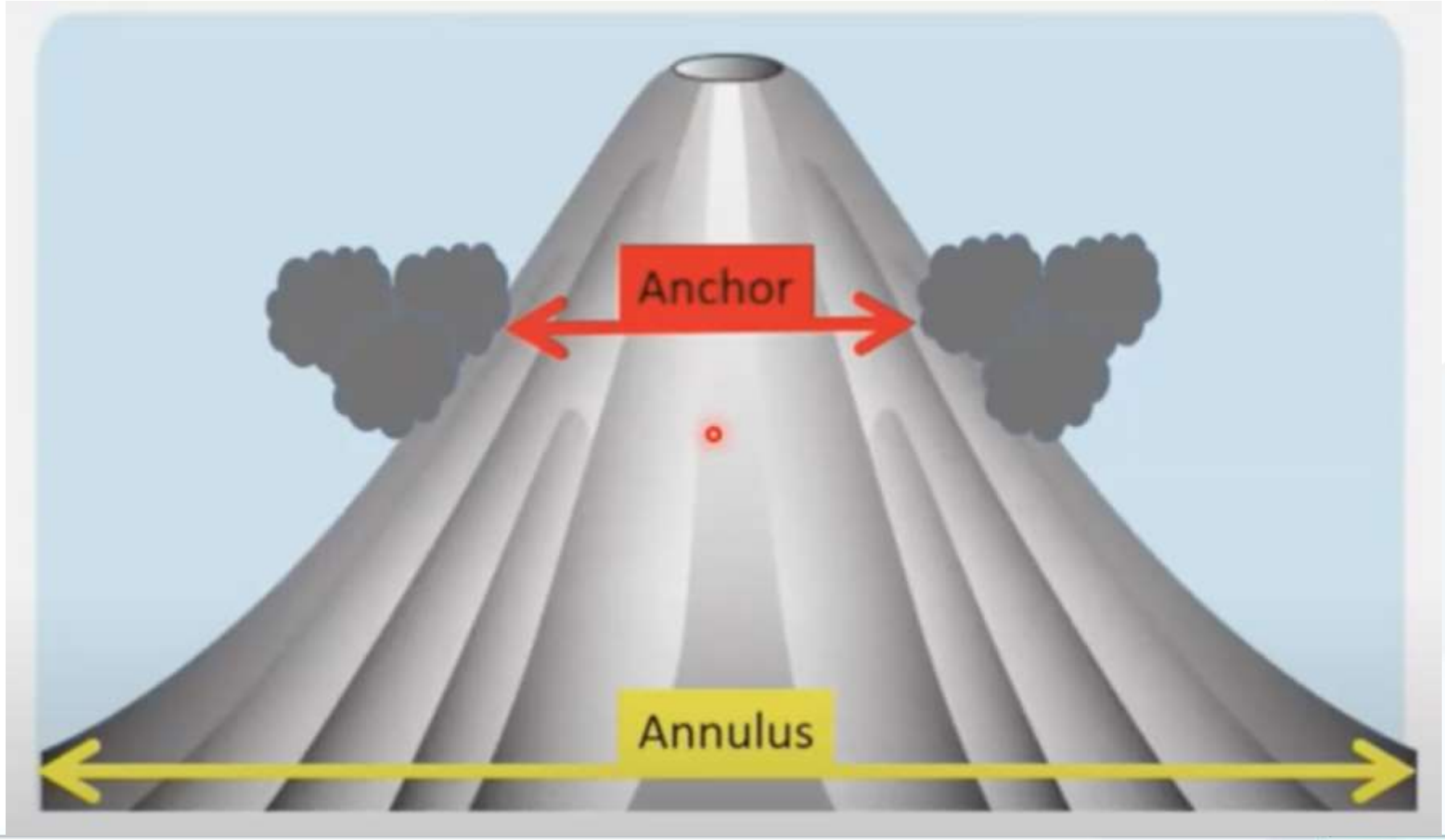
Risk of underexpansion / leak / Bicuspid



Risk of underexpansion / leak / Bicuspid

- **Complications arising more frequently** after TAVI in this cohort: PVL, nonuniform/noncircular valve deployment, device migration, and annular ruptur

- Some authors suggest that **self-expanding valve may be preferable** to a balloon-expandable device, both to conform to an asymmetric valve orifice and to reduce risk of annular rupture

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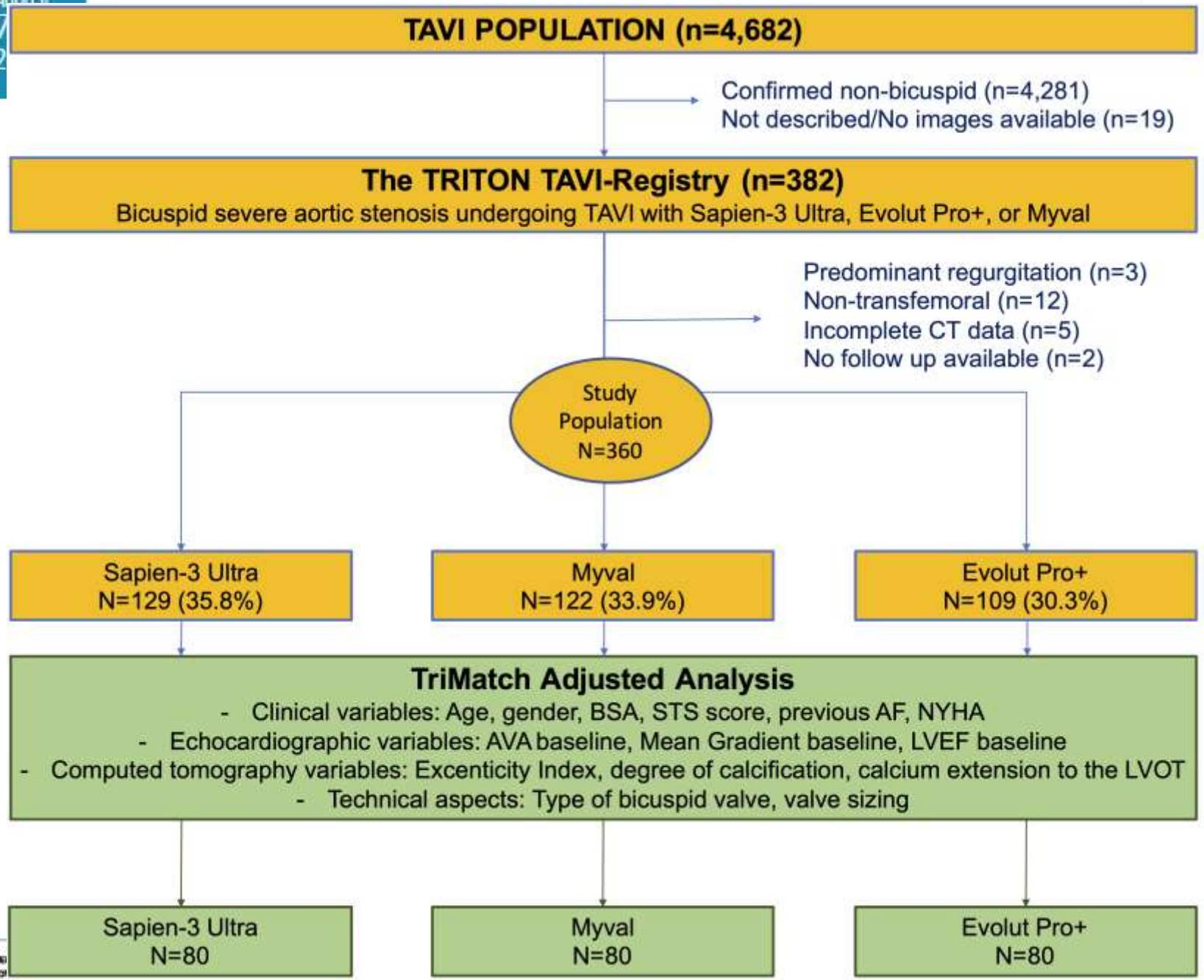

Amat-Santos. Rev Esp Cardiol. 2023

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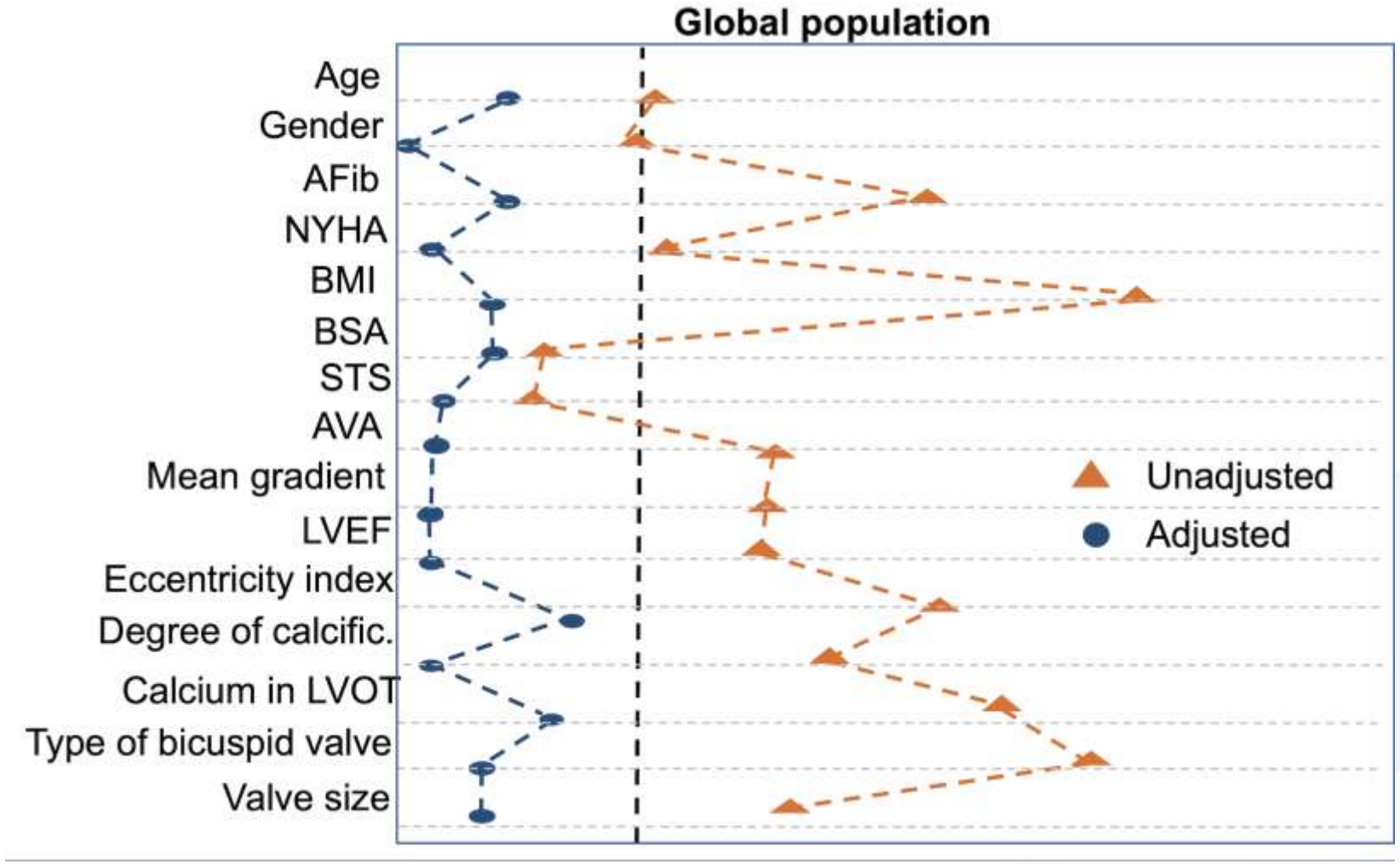

Amat-Santos. Rev Esp Cardiol. 2023

MAIN OUTCOMES ACCORDING TO DEVICE AND COMPARED TO PRIOR PUBLICATION

Amat-Santos. Rev Esp Cardiol. 2023

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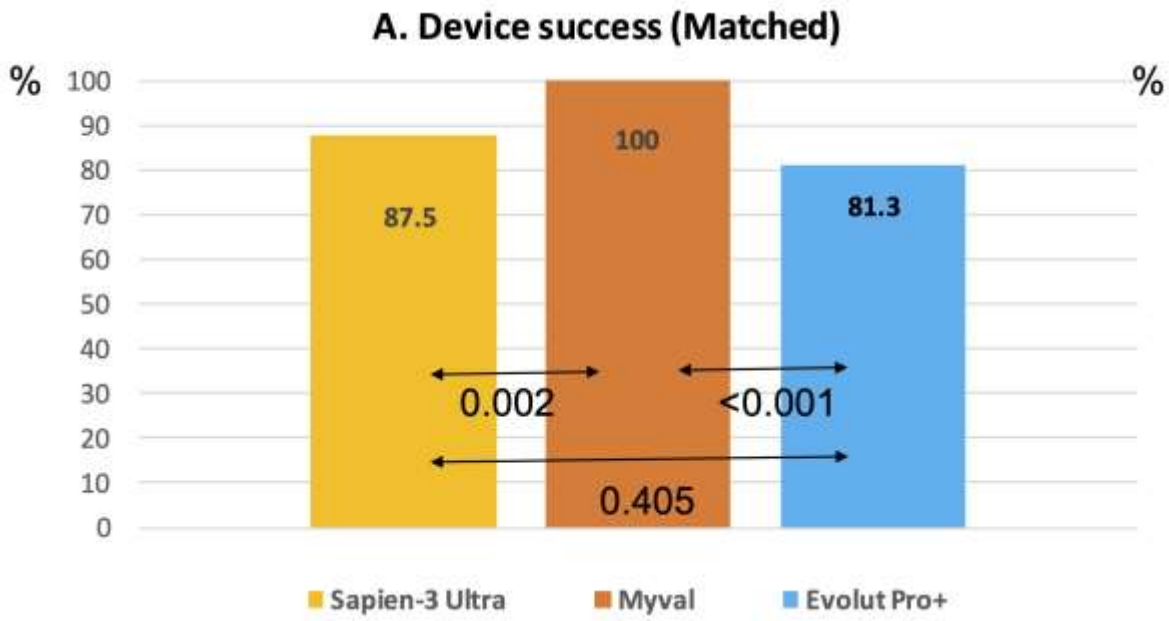

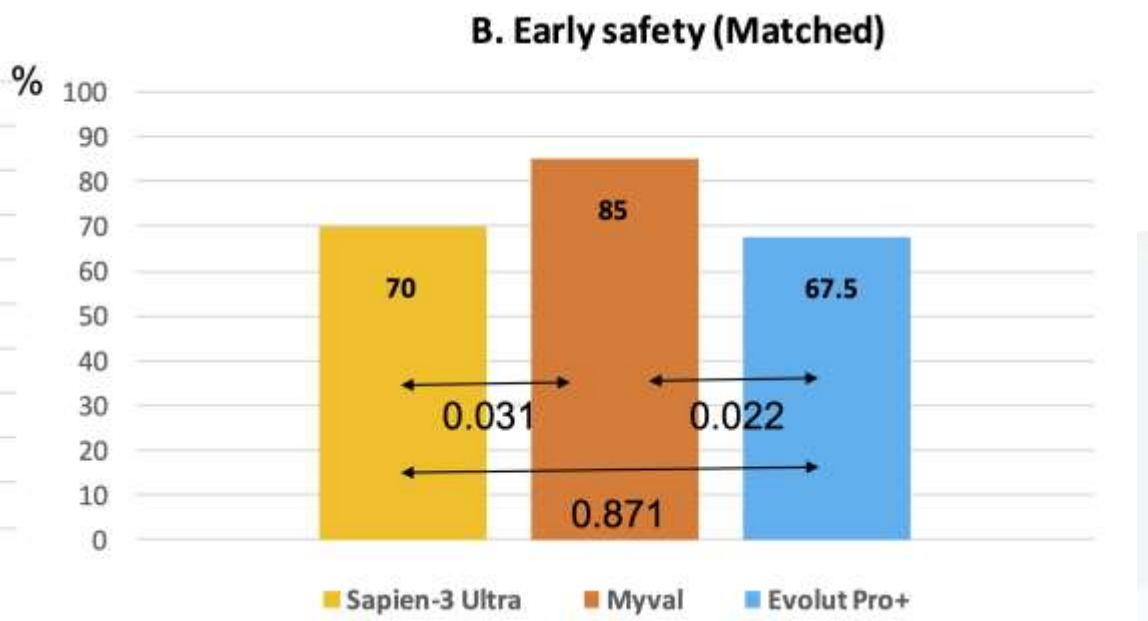

Amat-Santos. Rev Esp Cardiol. 2023

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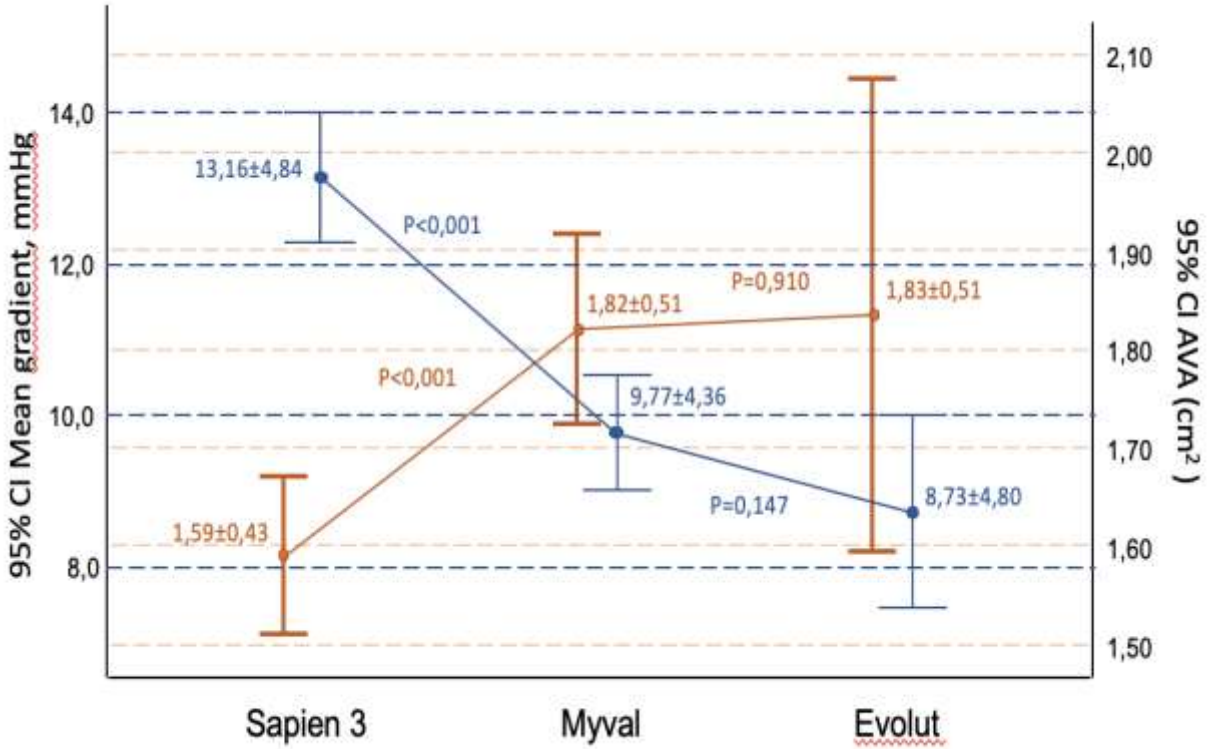

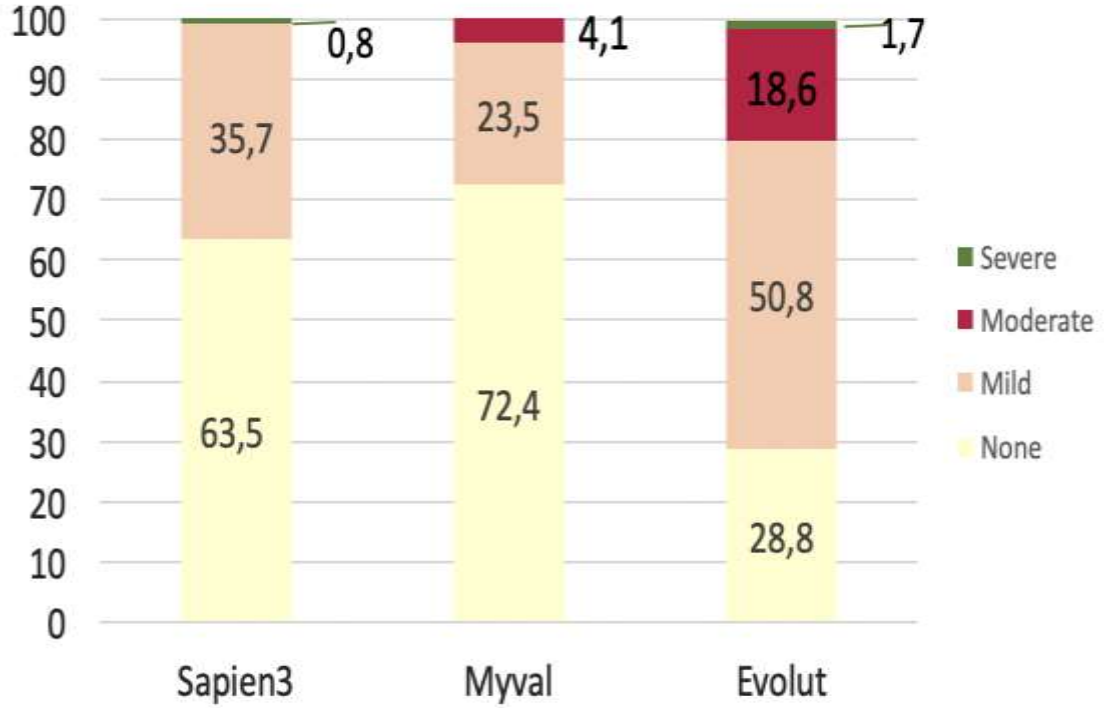

Amat-Santos. Rev Esp Cardiol. 2023

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AVOID RISKS

- LIFE THREATENING
- CONDUCTION DISTURBANCES
- DIFFICULT CORON.RE-ACCESS

GOOD HEMODYNAMICS:

- NO LEAK
- NO RESIDUAL GRADIENTS

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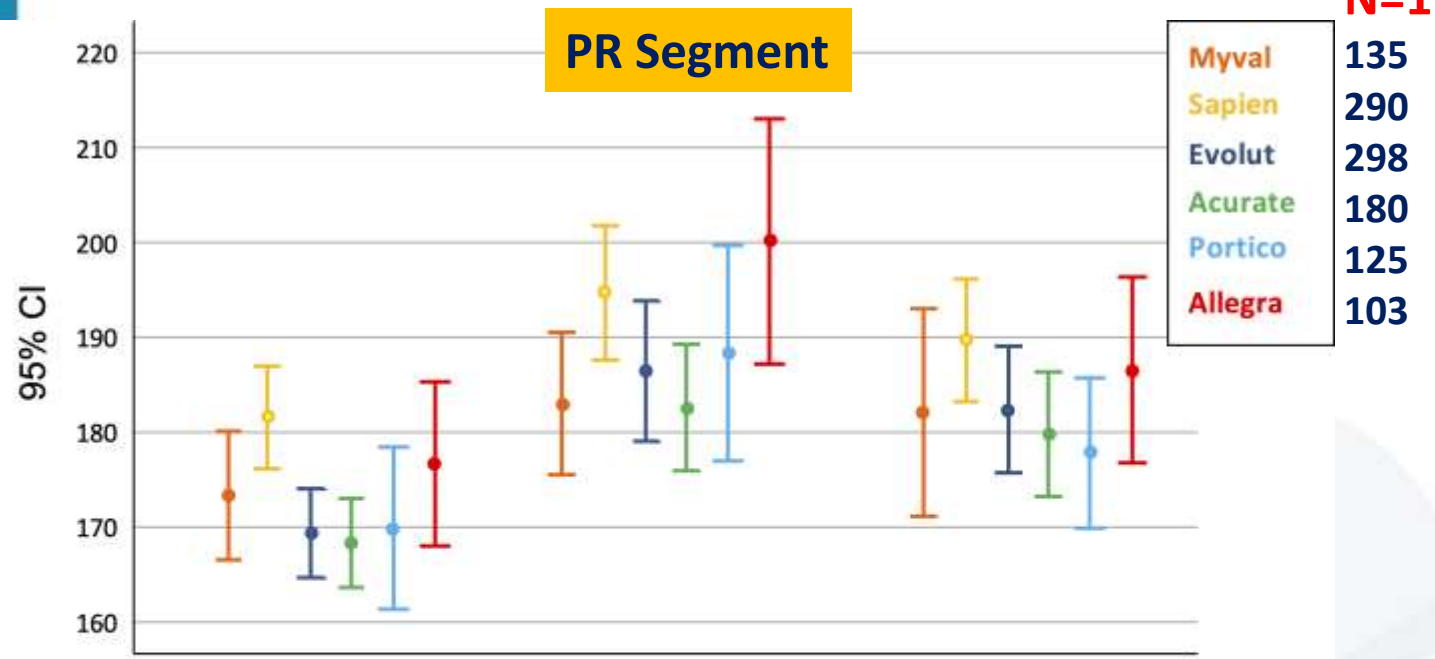
PR Segment



	N
Myval	135
Sapien	290
Evolut	298
Acurate	180
Portico	125
Allegra	103

N=1131

	PR PRE	PR POST	PR DISCHARGE
Myval - Sapien	0.097	0.051	0.226
Myval - Evolut	0.342	0.504	0.967
Myval - Acurate	0.227	0.929	0.715
Myval - Portico	0.525	0.414	0.525
Myval - Allegra	0.554	**0.024**	0.556

Table shows the p-values of the PR comparison between valve types in each time period.

Amat-Santos. Internac J Cardiol. 2021

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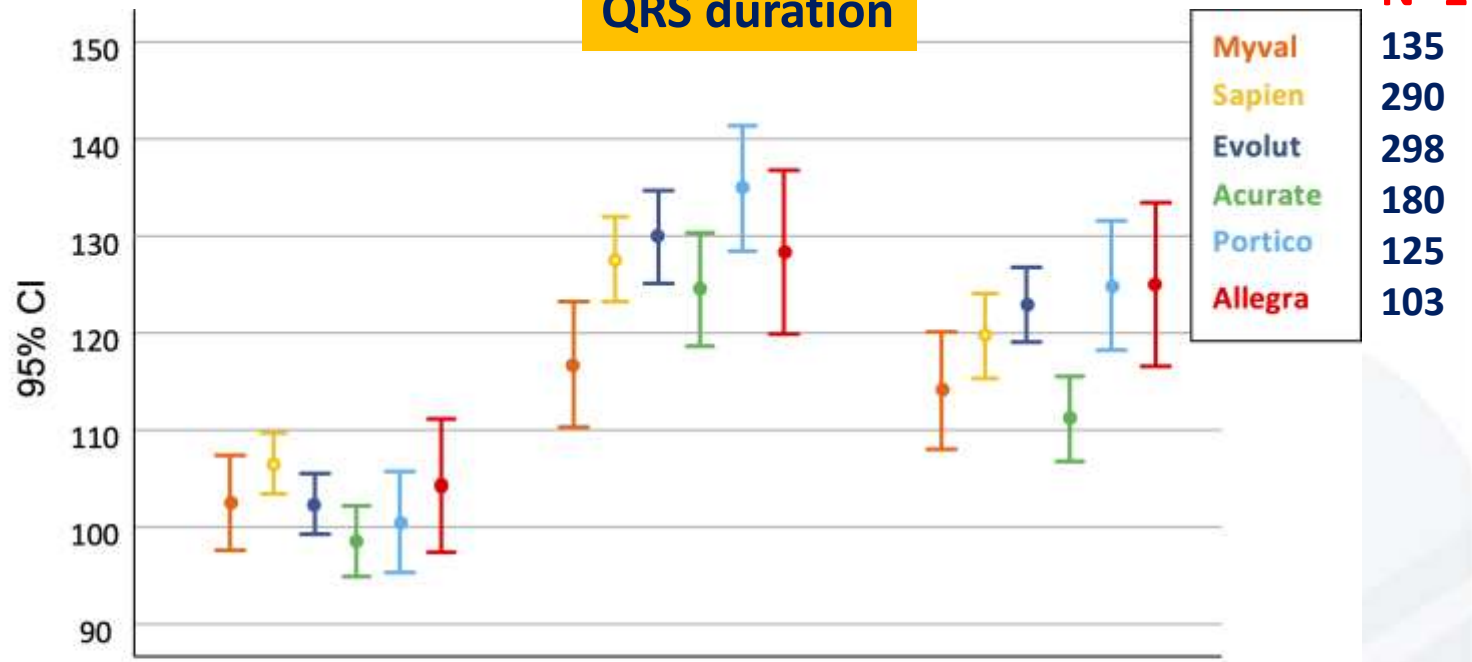
QRS duration



N=1131

Myval	135
Sapien	290
Evolut	298
Acurate	180
Portico	125
Allegra	103

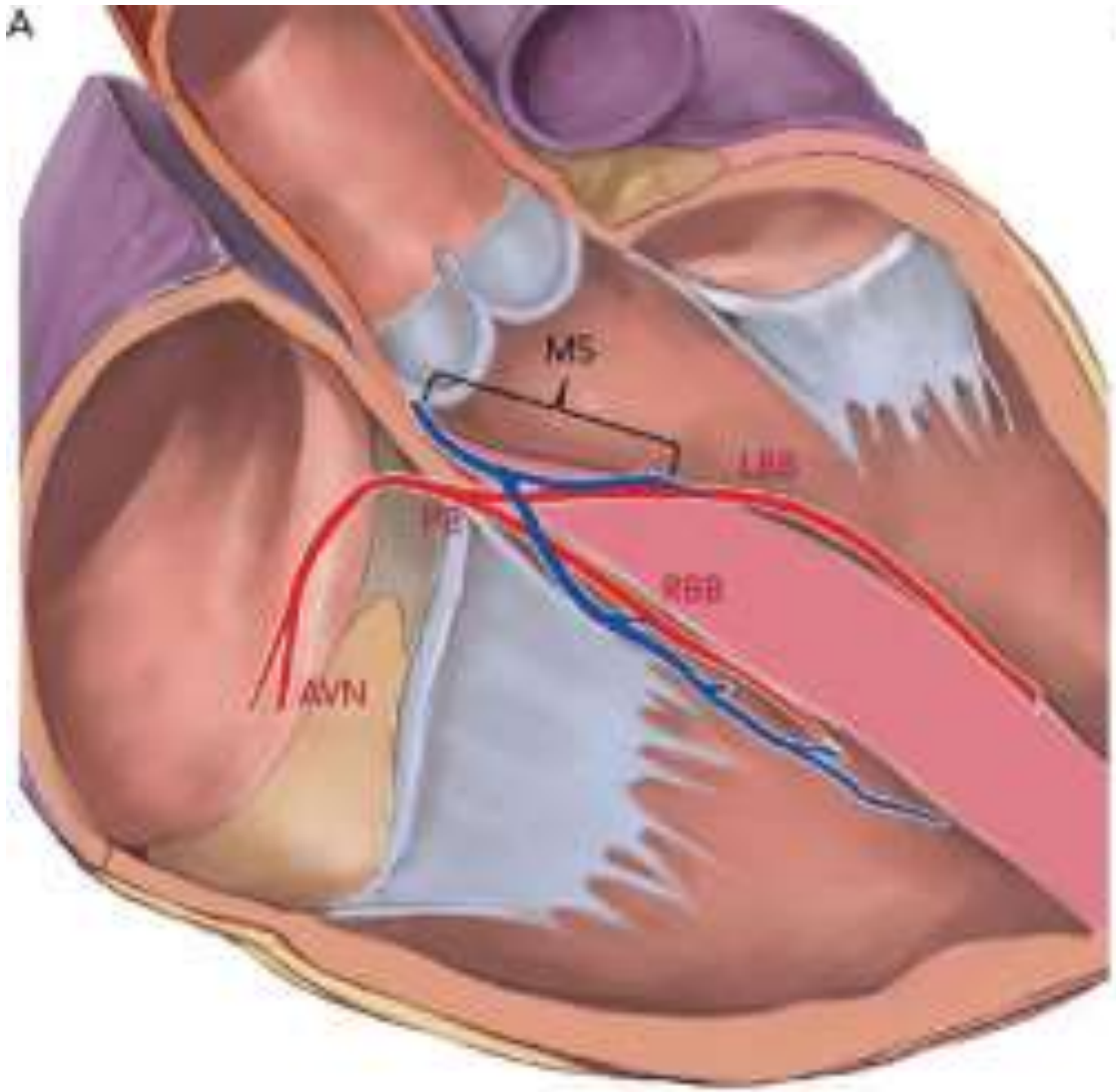
	QRS PRE	QRS POST	QRS DISCHARGE
Myval - Sapien	0.200	**0.006**	0.153
Myval - Evolut	0.929	**0.001**	**0.015**
Myval - Acurate	0.177	0.075	0.435
Myval - Portico	0.569	**<0.001**	**0.019**
Myval - Allegra	0.695	**0.030**	**0.040**

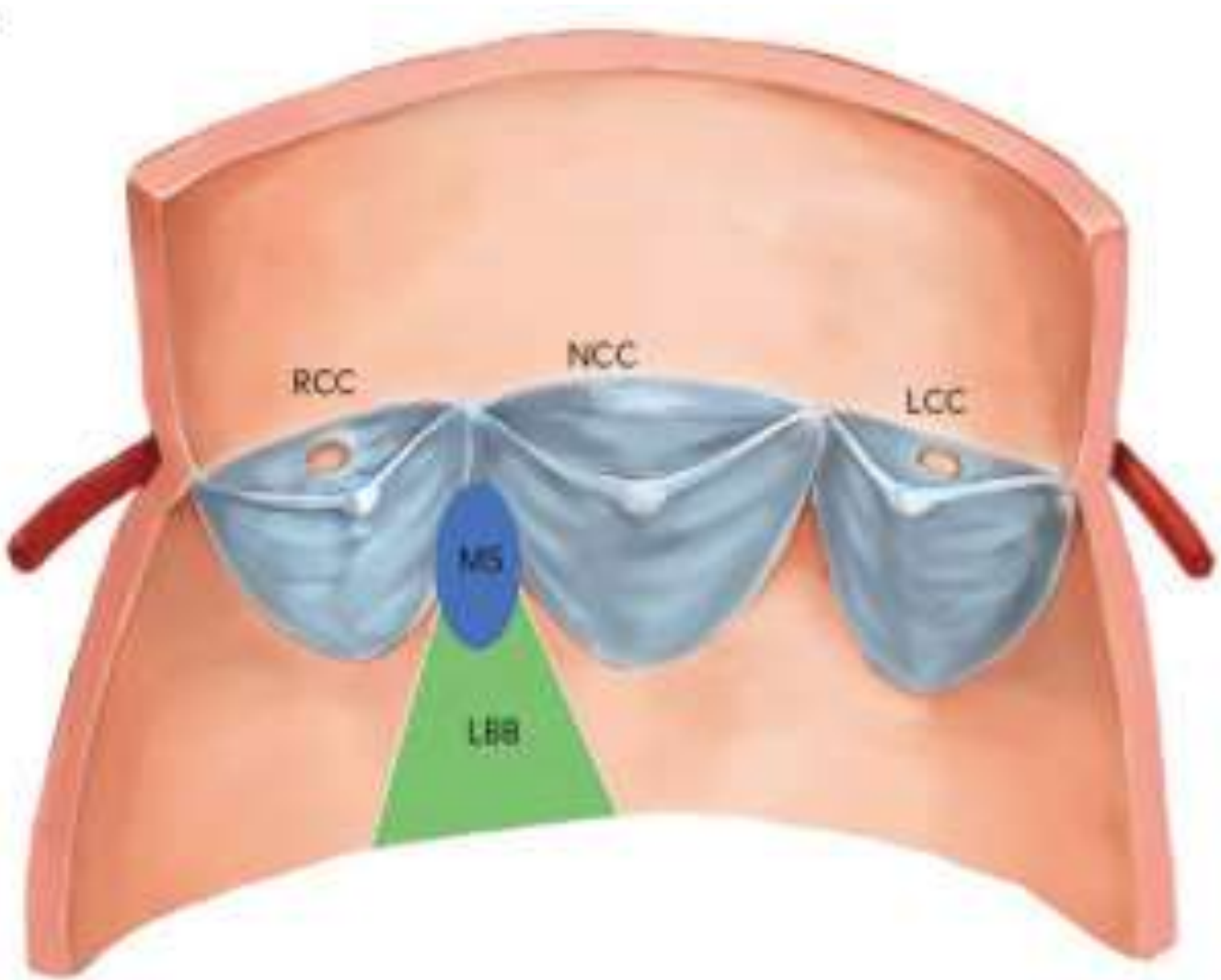
Table shows the p-values of the QRS comparison between valve types in each time period.

Amat-Santos. Internac J Cardiol. 2021

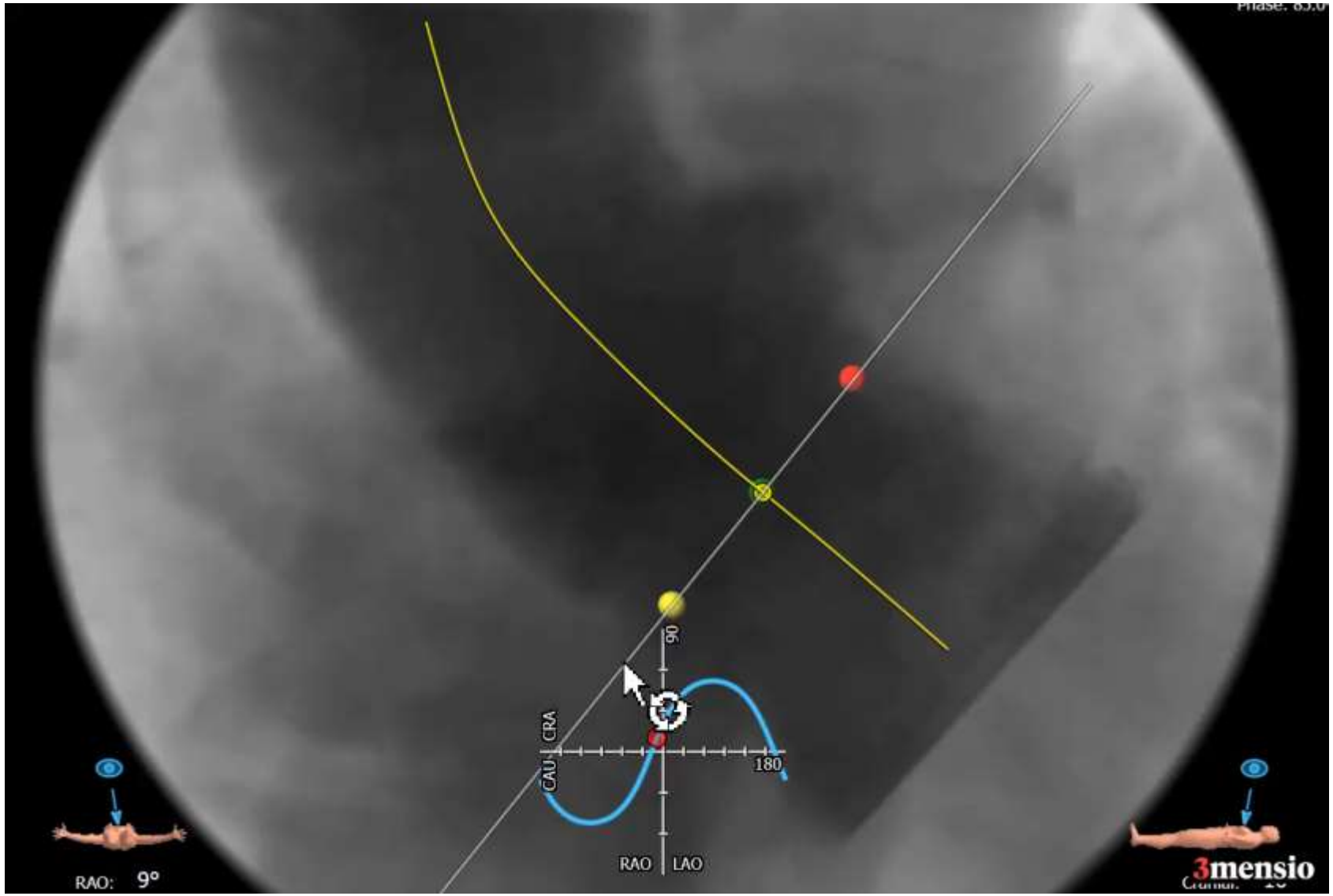
PACEMAKER RATE

	Global population n=1131	Myval n=135	Sapien 3 n=290	p	Evolut n=298	p	Acurate n=180	p	Portico n=125	p	Allegra n=103	p
PPI	176 (15.9)	10 (7.4)	39 (13.4)	0.069	53 (18.5)	0.003	16 (9.1)	0.585	36 (29.5)	<0.001	22 (22)	0.001

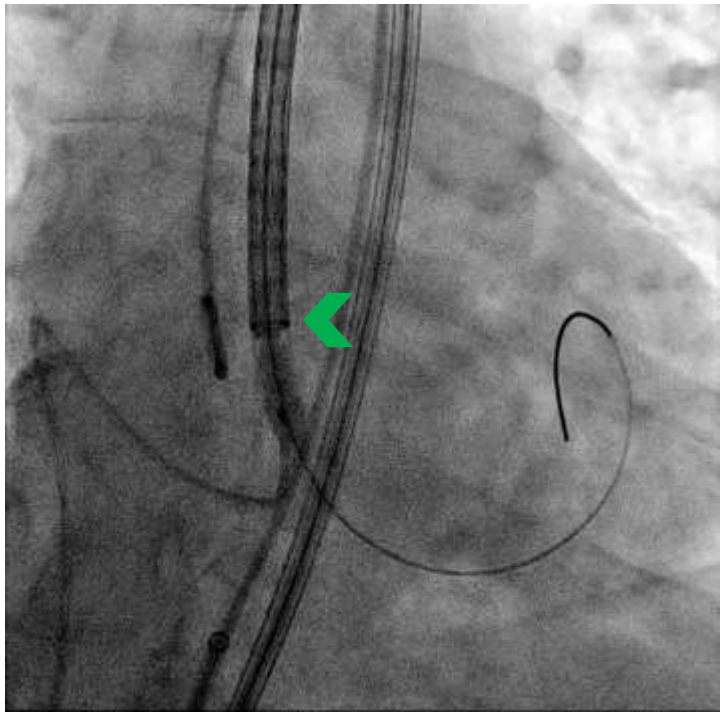

A
MS
LBB
RBB
AVN

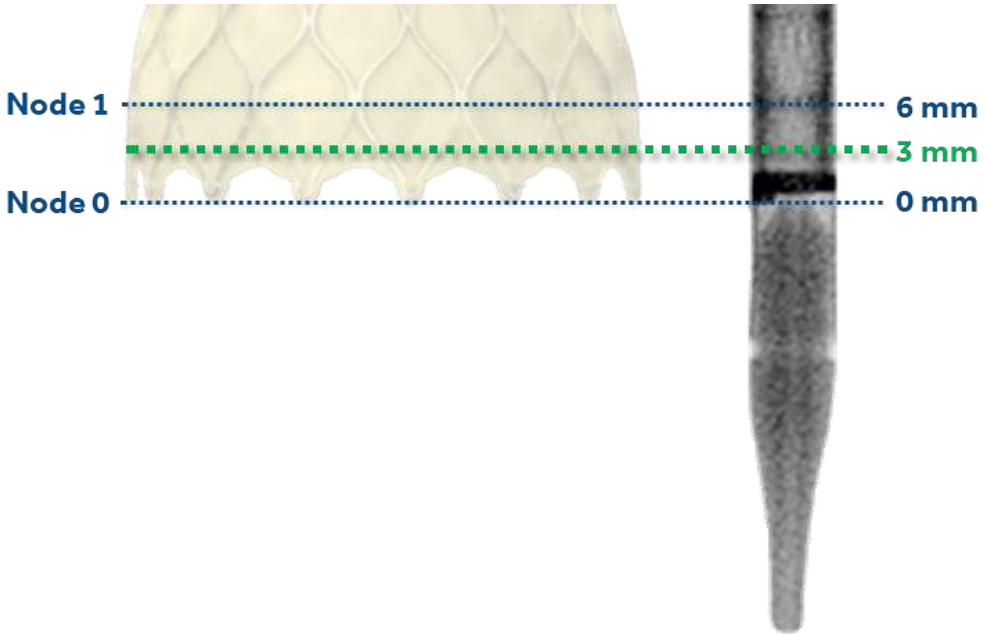

B
RCC
NCC
LCC
MS
LBB

1- CUSP OVERLAP VIEW



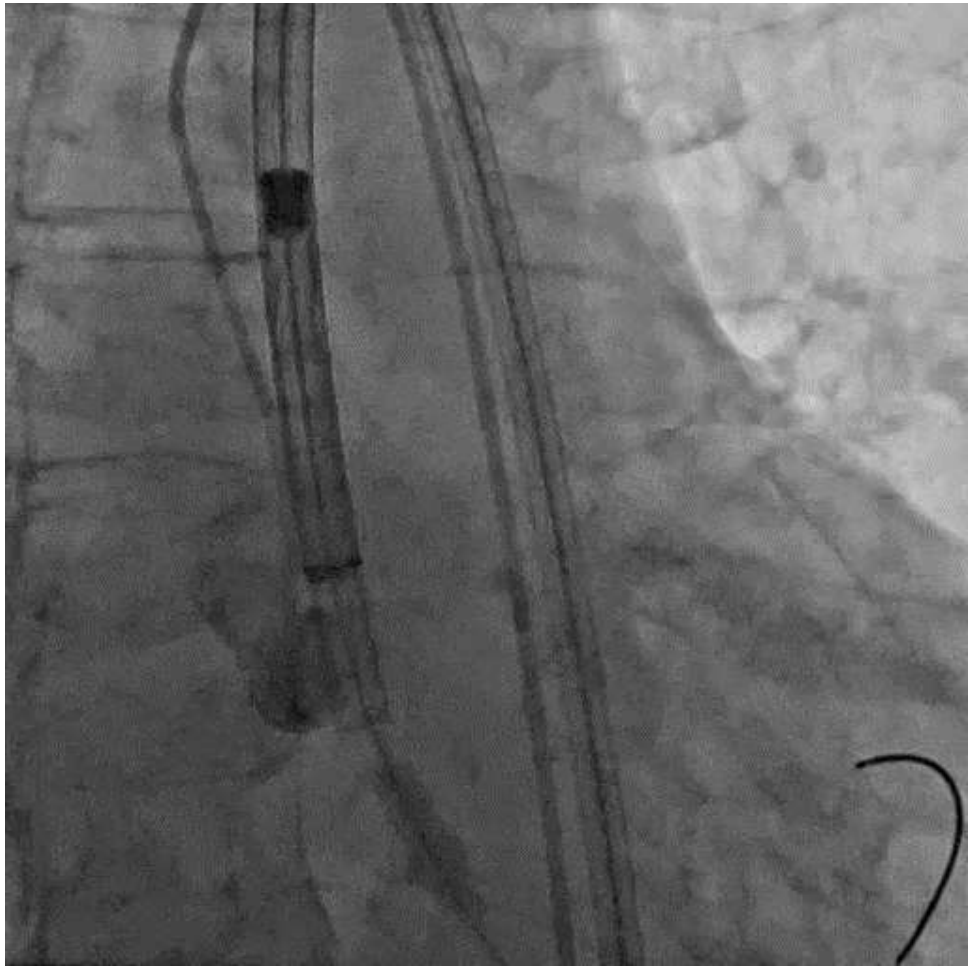
2-RADIOPAQUE MARKER BAAND AT MID PIGTAIL
3- AIM IMPLANT DEPTH 3mm



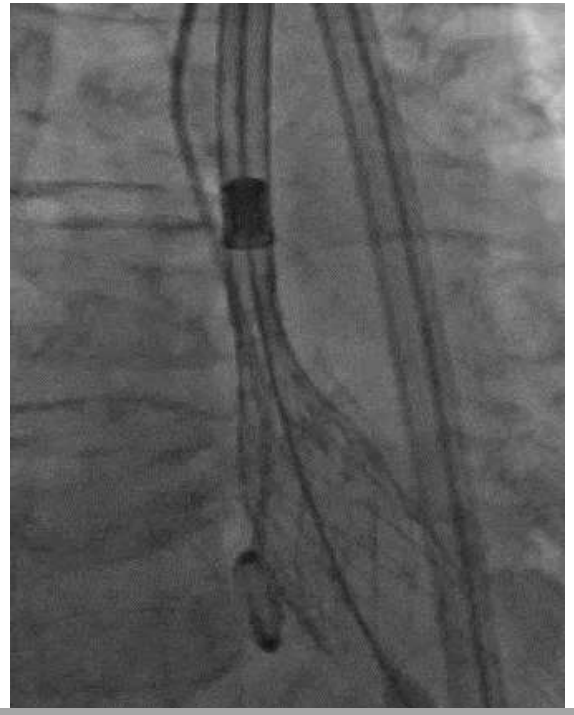


3 mm Target Implant Depth

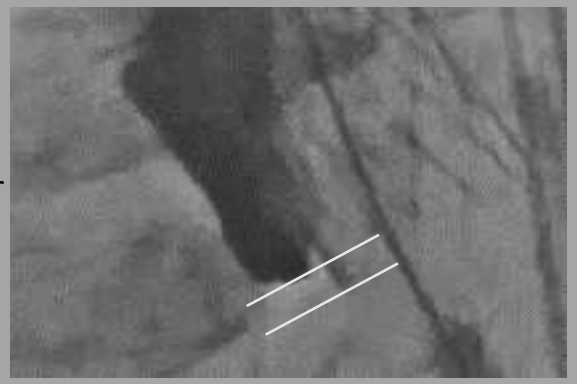
4- SLOW DEPLOYMENT (CONSIDER PACING)



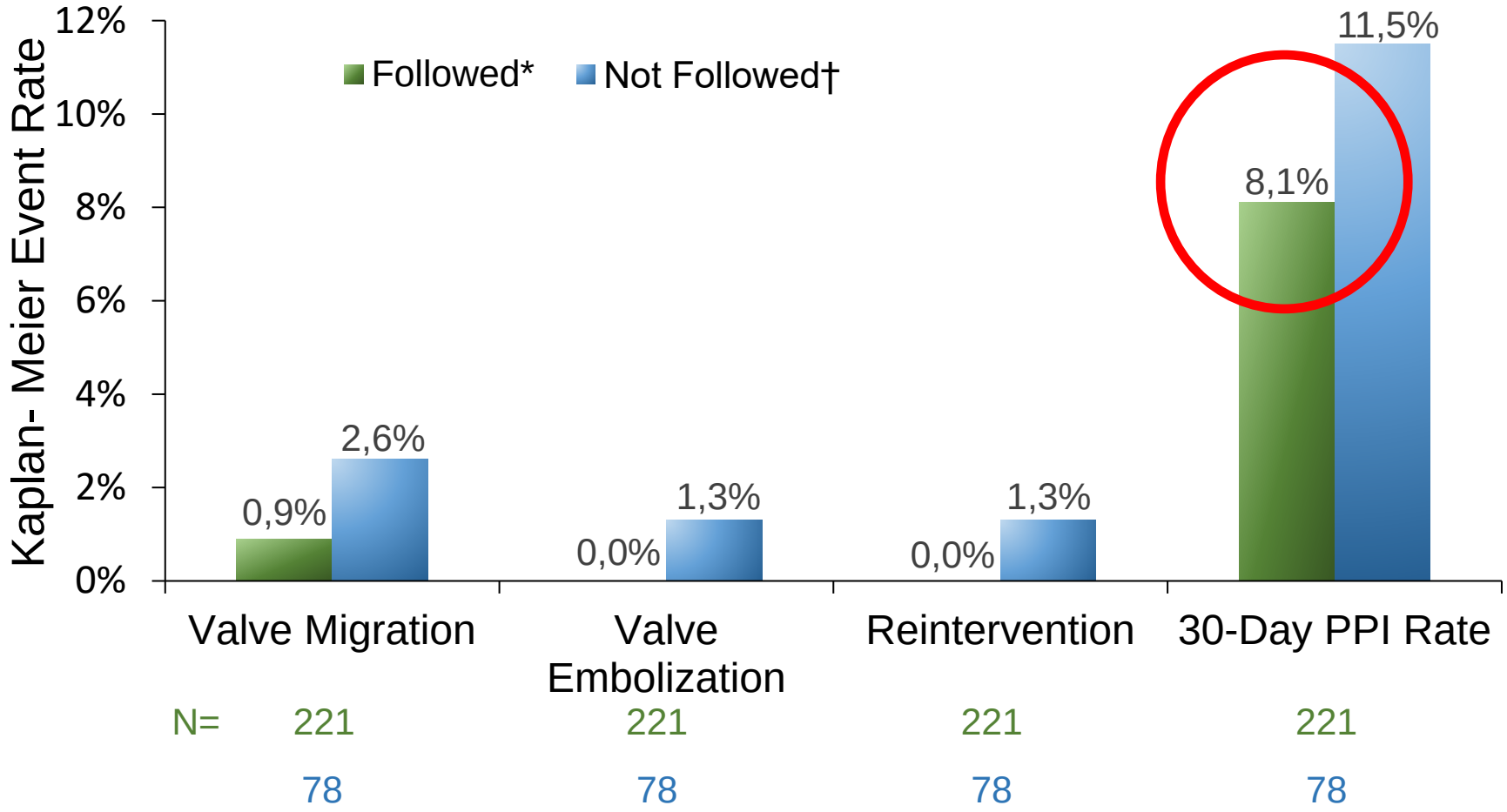
5- MOVE TO 3 CUSP COPLANAR VIEW AND ROLL TO LAO TO MINIMIZE PARALLAX



NCC depth may <u>appear</u> shallower in the LAO view.

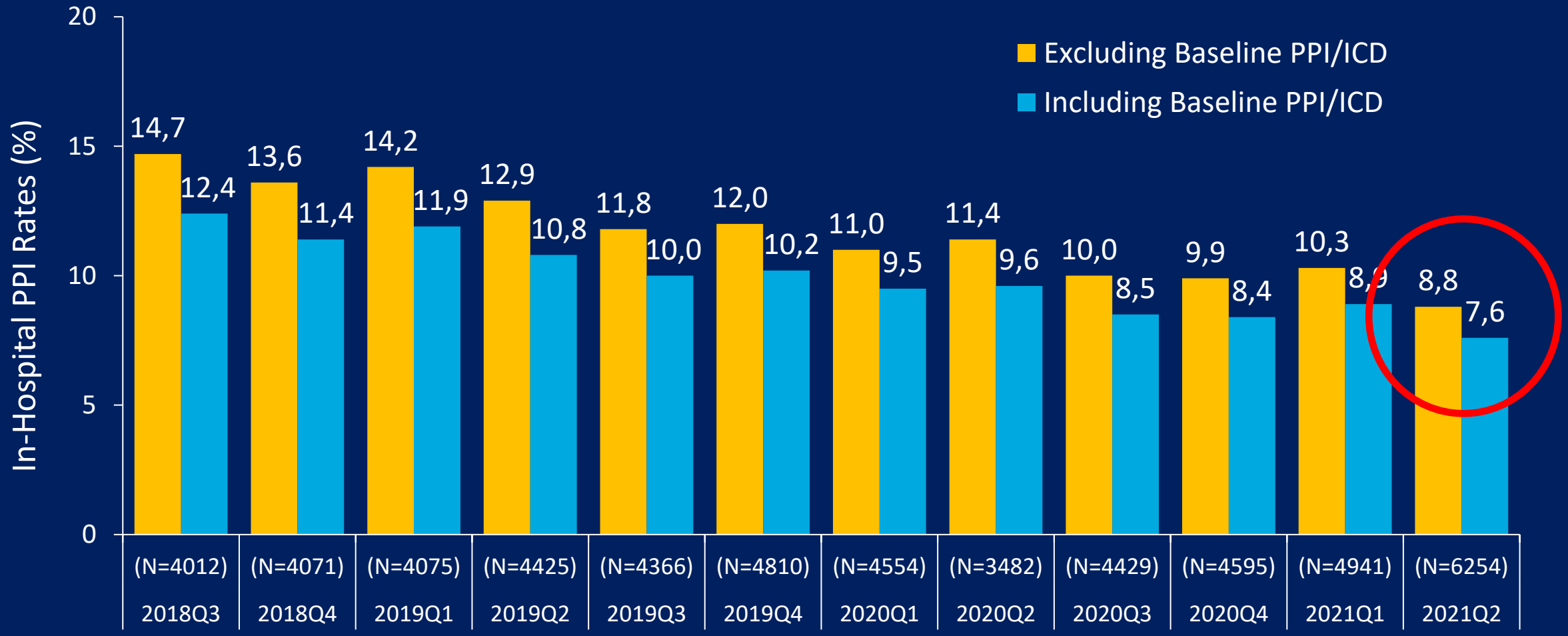


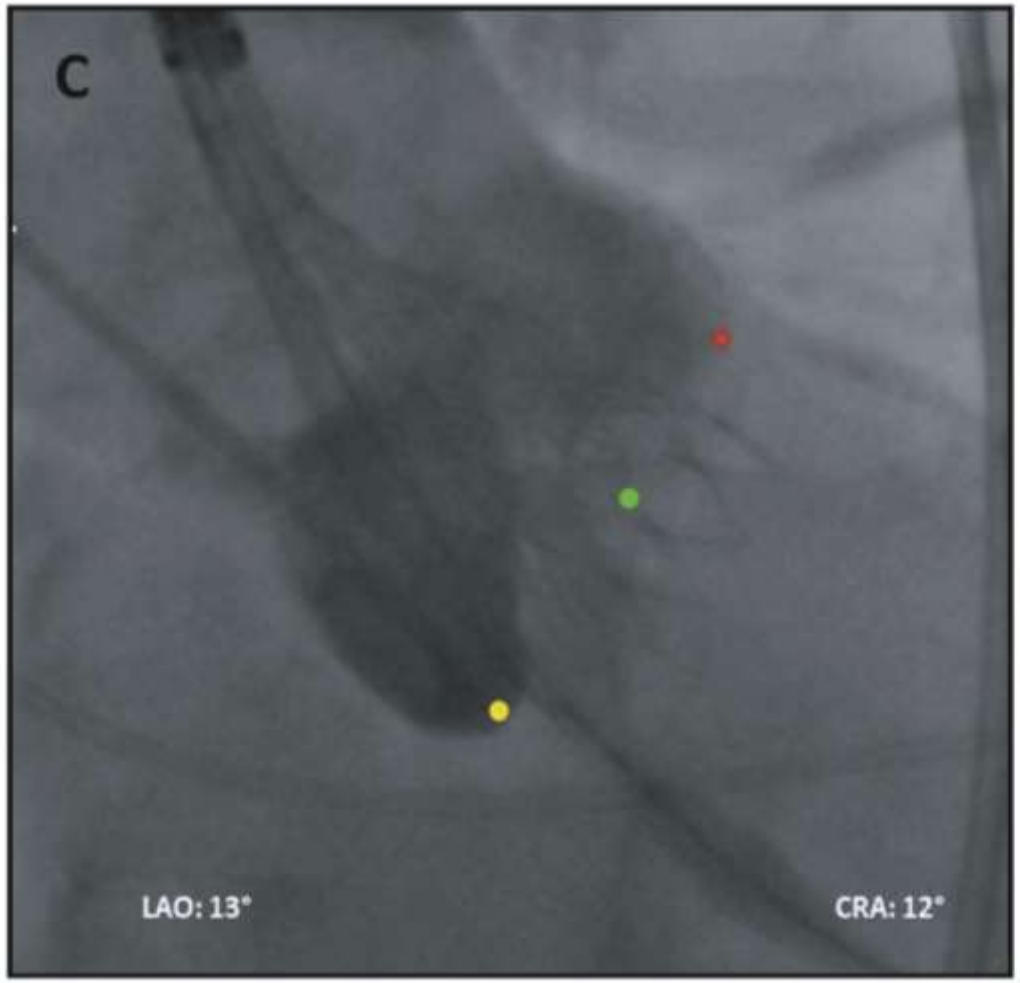
RESULTS OF **OPTIMIZE PRO STUDY**: FOLLOWING OFFICIAL RECOMMENDATIONS

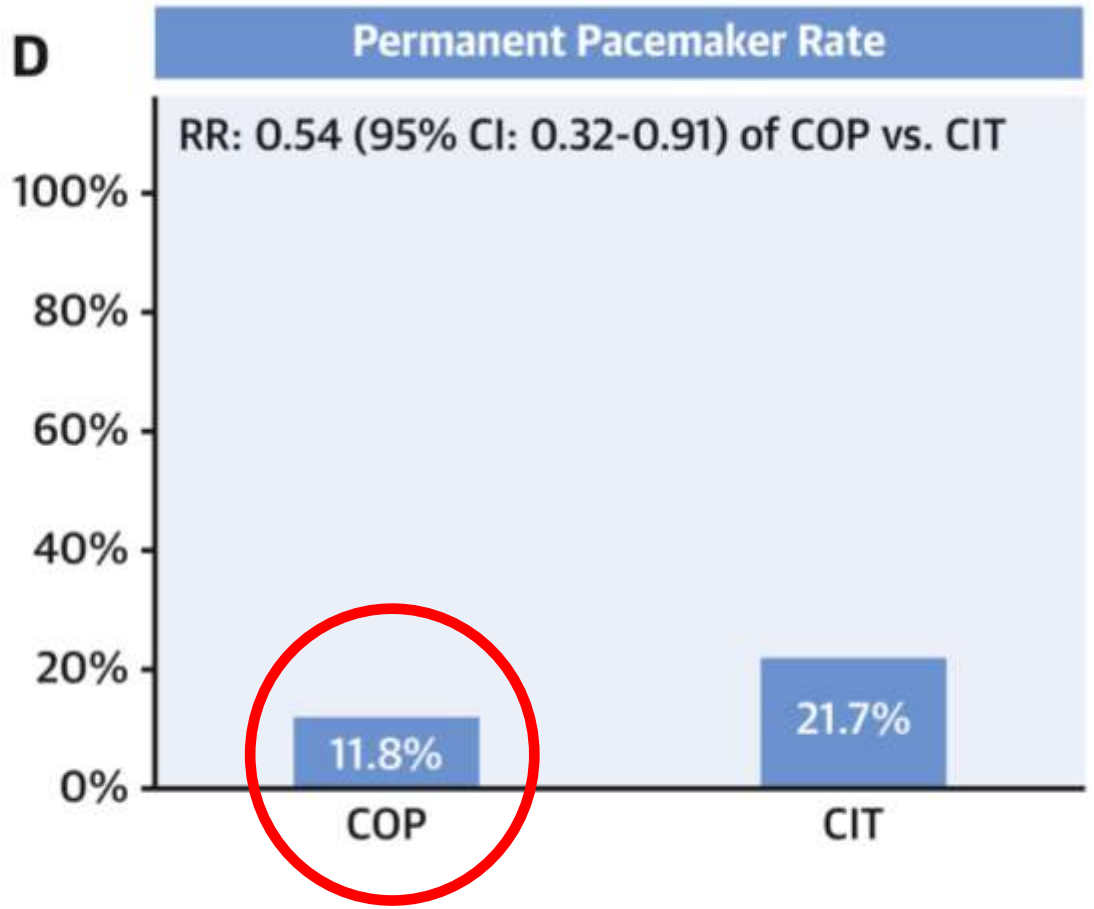


Grubb et al. EuroPCR 2022

In-hospital Pacemaker Rates by Quarter







Pascual, I. et al. J Am Coll Cardiol Intv. 2022;15(2):150-161.

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Valve-in-valve procedures

- Increased risk of coronary obstruction
- Elevated postprocedural pressure gradients

- **NO** difference between the CoreValve and Sapien valves in the incidence of coronary obstruction
- **HIGHER** postprocedural gradient with Sapien valves

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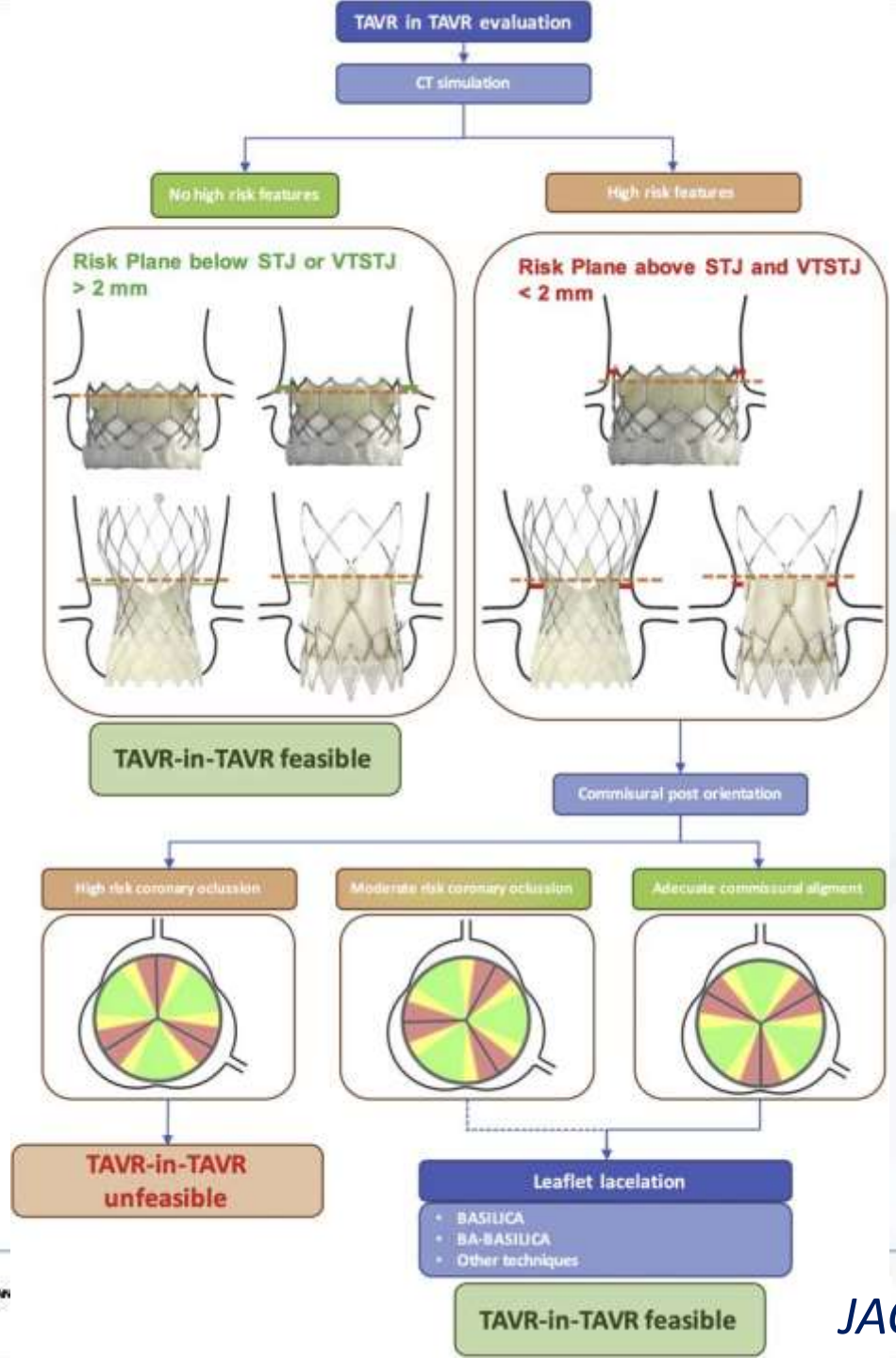

JACC INTV 2022. Amat-Santos, et al

Severe LV dysfunction

- **If not-severe calcification**

→Navitor provides more stable hemodnamycs during deployment

→Acurate neo with no paciente also stable

- **If severe calcification**

→BE-TAVI to avoid severe PVL and post-dilation

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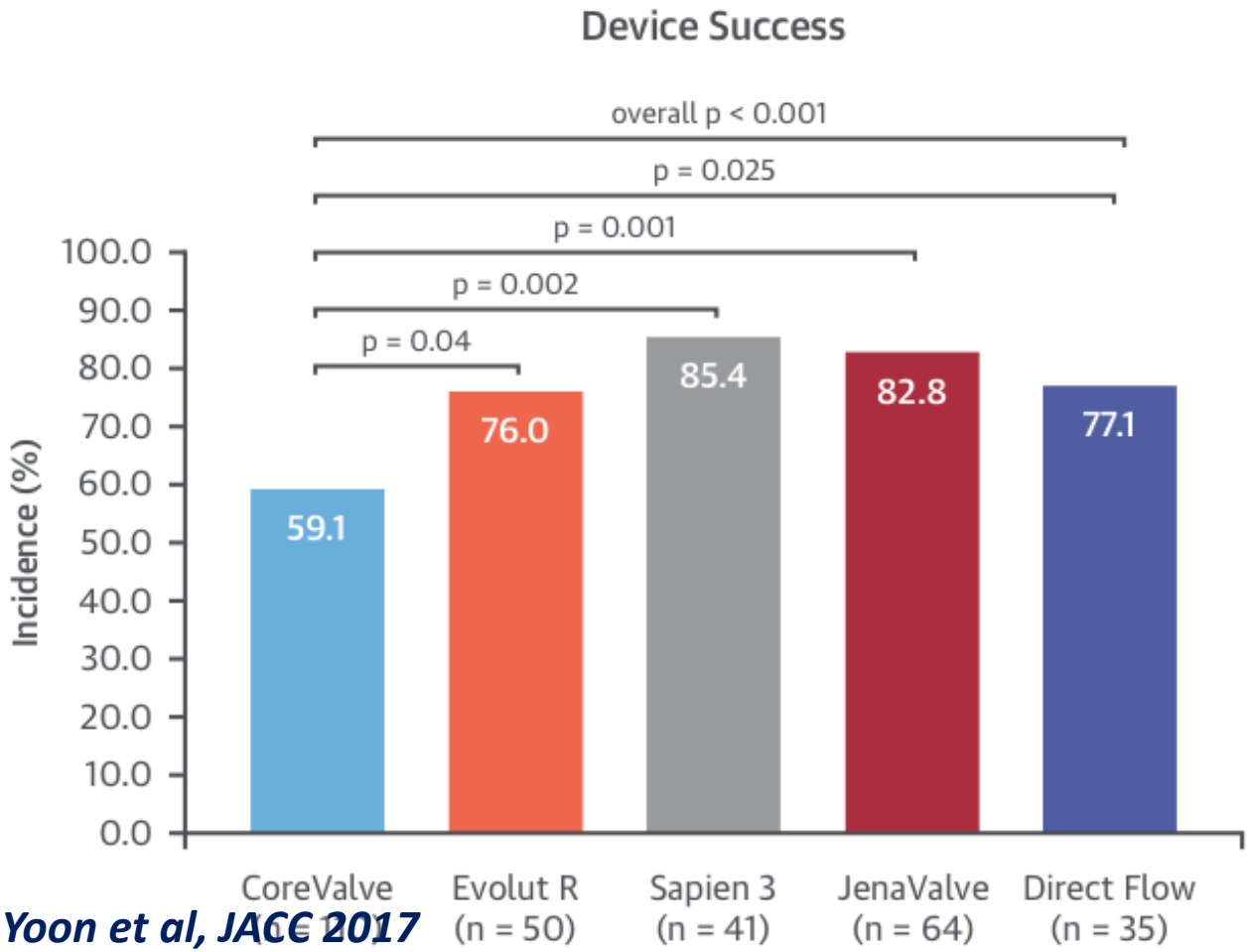
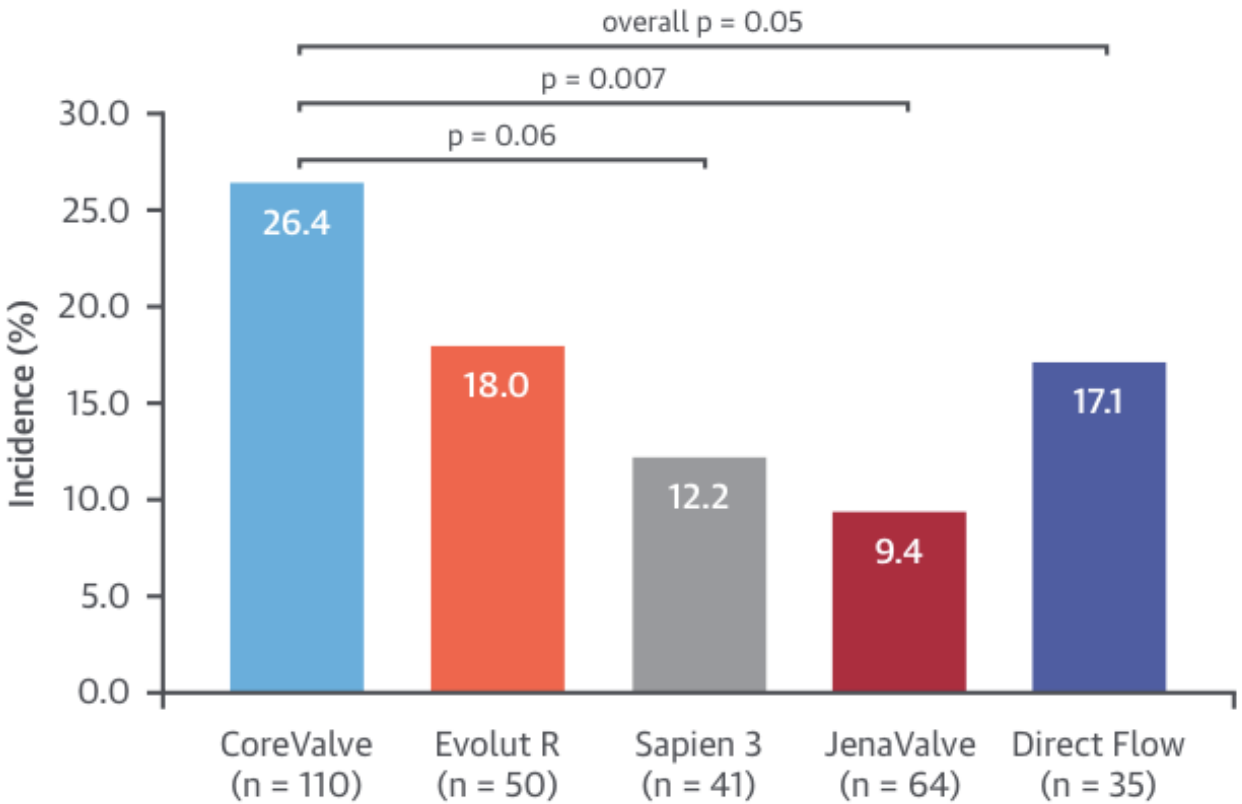
Pure (non-cacified) Ao Reg

Transcatheter Aortic Valve Replacement in Pure Native Aortic Valve Regurgitation

Sung-Han Yoon, MD,[a] Tobias Schmidt, MD,[b] Sabine Bleiziffer, MD,[c] Niklas Schofer, MD,[d] Claudia Fiorina, MD,[e] Antonio J. Munoz-Garcia, MD,[f] Ermela Yzeiraj, MD,[g] Ignacio J. Amat-Santos, MD,[h] Didier Tchetche, MD,[i] Christian Jung, MD,[j] Buntaro Fujita, MD,[k] Antonio Mangieri, MD,[l] Marcus-Andre Deutsch, MD,[c,m] Timm Ubben, MD,[b] Florian Deuschl, MD,[d] Shingo Kuwata, MD,[n] Chiara De Biase, MD,[o] Timothy Williams, MD,[p] Abhijeet Dhoble, MD,[p] Won-Keun Kim, MD,[q] Enrico Ferrari, MD,[r] Marco Barbanti, MD,[s] E. Mara Vollema, MD,[t] Antonio Miceli, MD,[u] Cristina Giannini, MD,[v] Guilherme F. Attizzani, MD,[w] William K.F. Kong, MD,[x] Enrique Gutierrez-Ibanes, MD,[y] Victor Alfonso Jimenez Diaz, MD,[z] Harindra C. Wijeysundera, MD,[aa] Hidehiro Kaneko, MD,[c,m] Tarun Chakravarty, MD,[a] Moody Makar, MD,[a] Horst Sievert, MD,[ab] Christian Hengstenberg, MD,[ac,ad] Bernard D. Prendergast, MD,[ae] Flavien Vincent, MD,[f] Mohamed Abdel-Wahab, MD,[ag]

Second Valve Implantation !!!

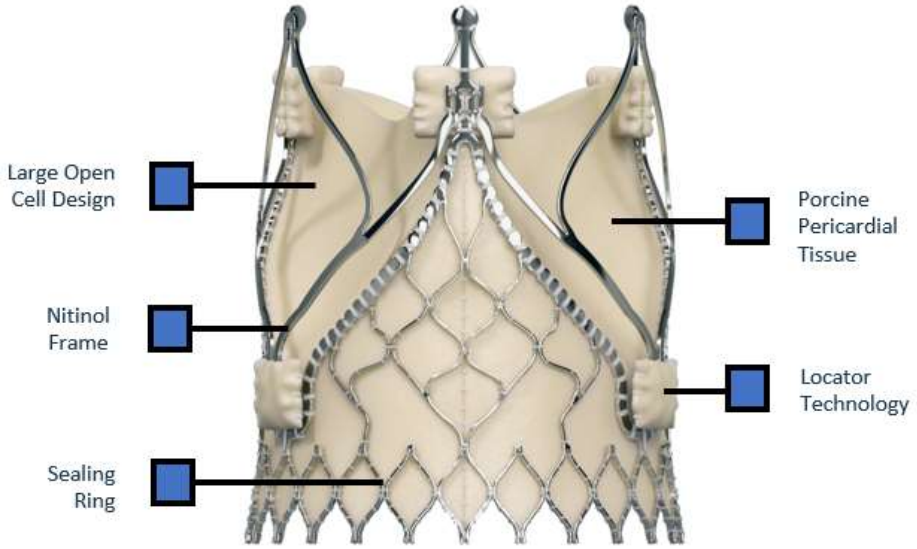


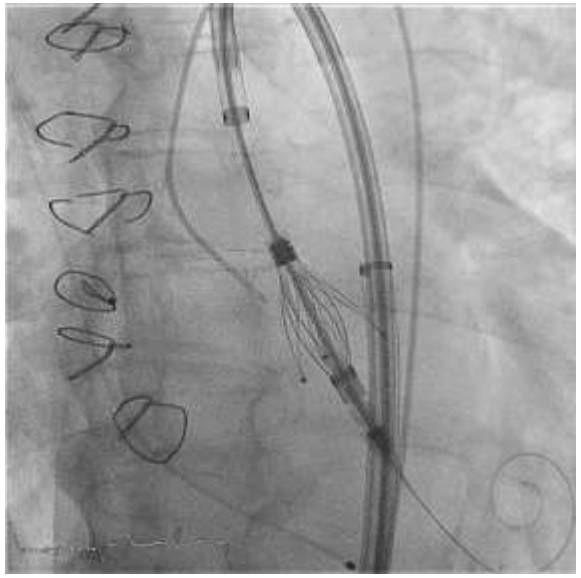


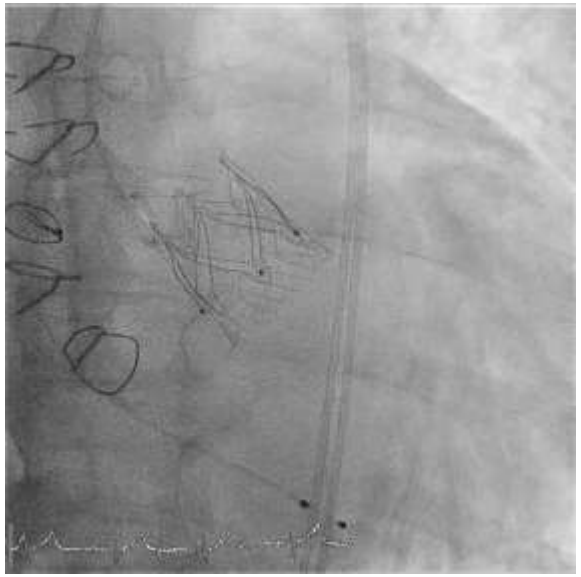
Yoon et al, JACC 2017

Jenavalve Trilogy TAVR System

- The Trilogy TAVI System features unique locators that align the THV with the native cusps of the valve and ensures anatomically correct alignment
- The locators “clip” onto the native leaflets, enabling anchoring in pure AR patients with non-calcified valves.

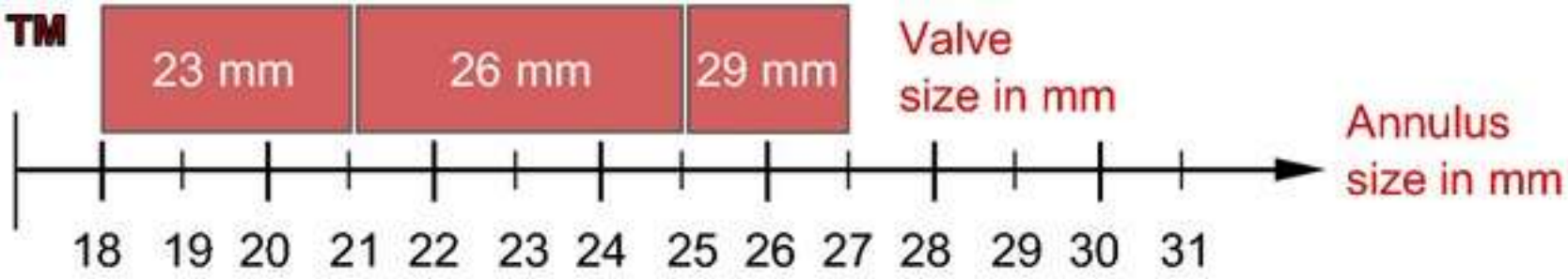




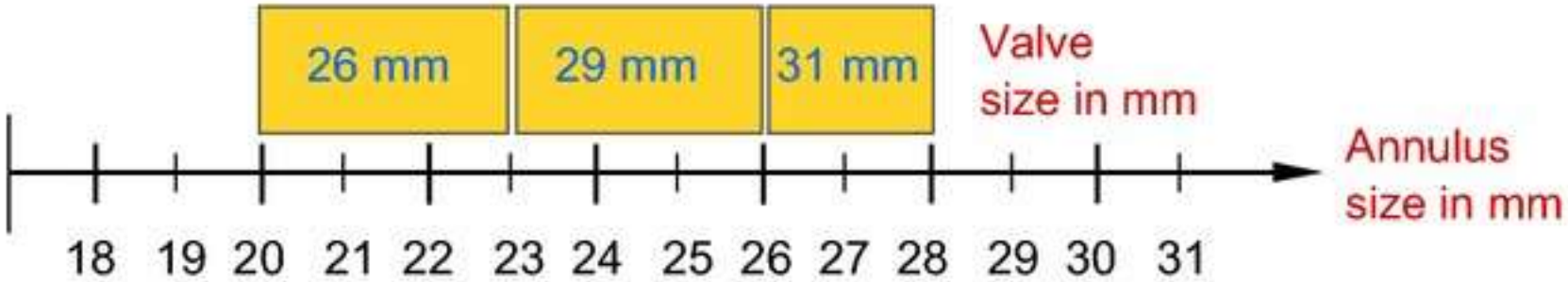


Left: Jenavalve Trilogy valve, **Center**: prosthesis with locators spread during implantation, seating the locators in the sinuses
Right: Valve after implantation with perfect position and no paravalvular regurgitation.

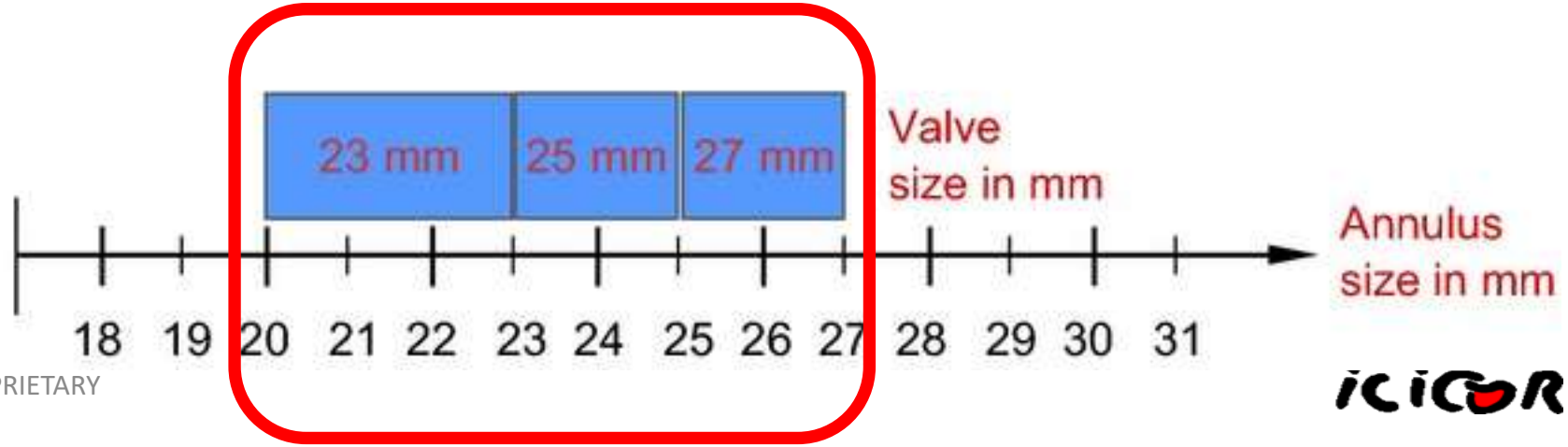
Edwards-Sapien ™ XT Valve



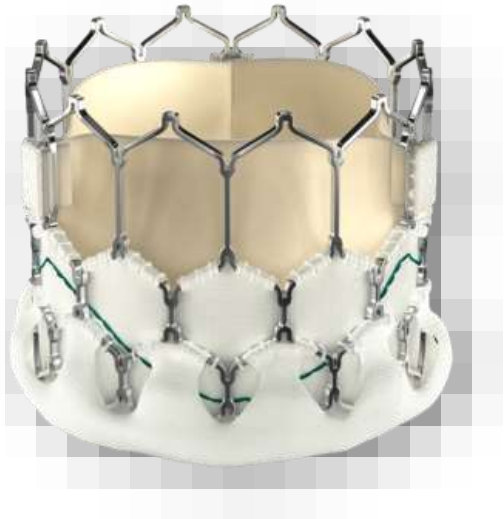
Core Valve ™



Jena Valve ™



PURE AR STUDY



Just accepted in Eurointevention

BASELINE CHARACTERISTICS

N=113 PTS	
AGE	*78.4 ± 7.46*
GENDER (Male)	73 (64.6%)
URGENT	14 (12.4%)
EUROSCORE II	3.48 ± 2.7
STS SCORE	2.71 ± 1.7

PURE STUDY

Just accepted in Eurointevention

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ANNULAR MEASUREMENTS	
AA AREA	**638.5 ± 106.1 mm²**
AA PERIMETER	88.5 ± 8.0 mm
LM HEIGHT	14.8 ± 3.6 mm
RC HEIGHT	17.4 ± 3.8 mm
CALCIUM (AA, LVOT)	**17 (15%)**
STJ DIAMETER	37.0 ± 5.6 mm
SoV DIAMETER	39.15 ± 6.0 mm

PURE STUDY

Just accepted in Eurointevention

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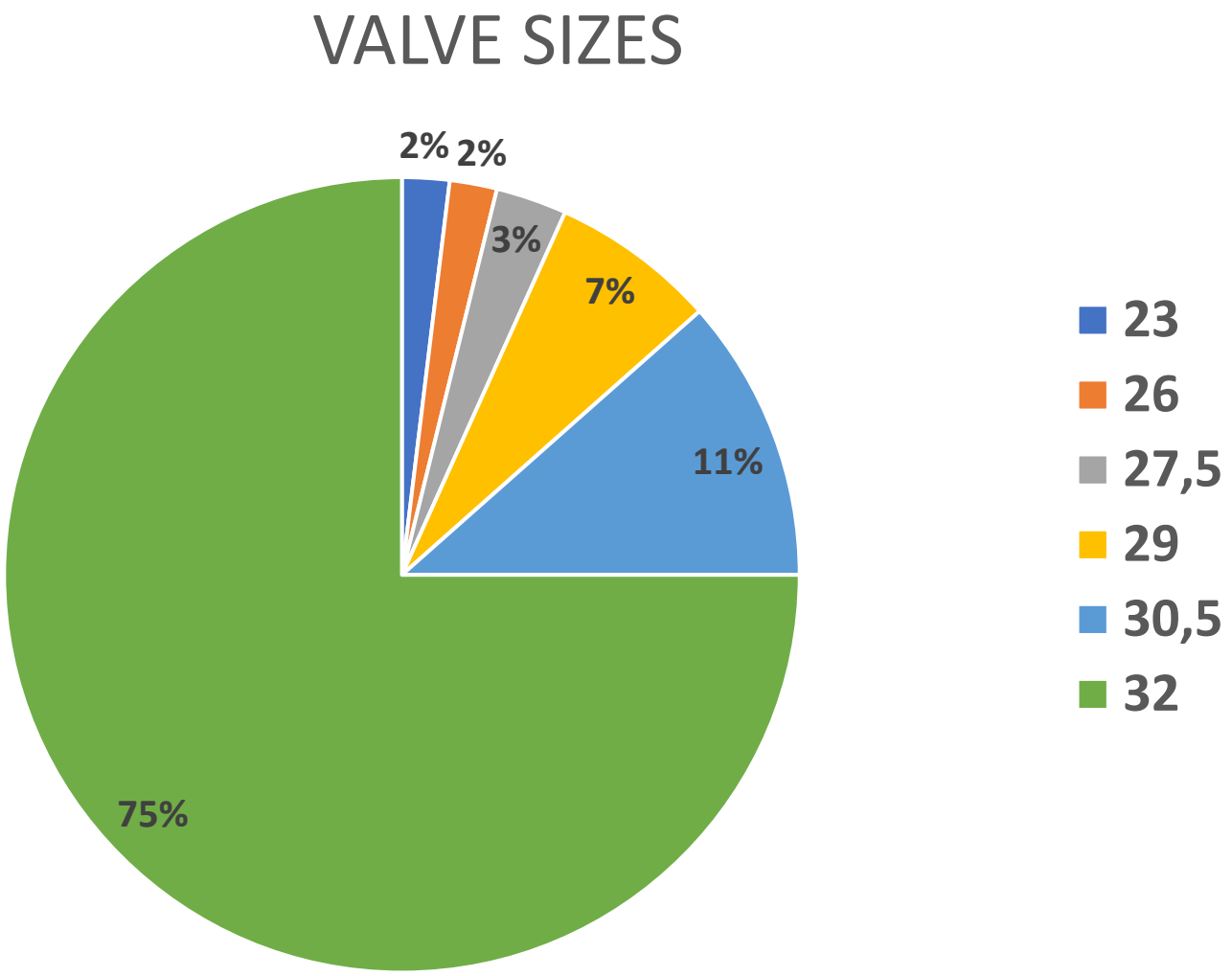

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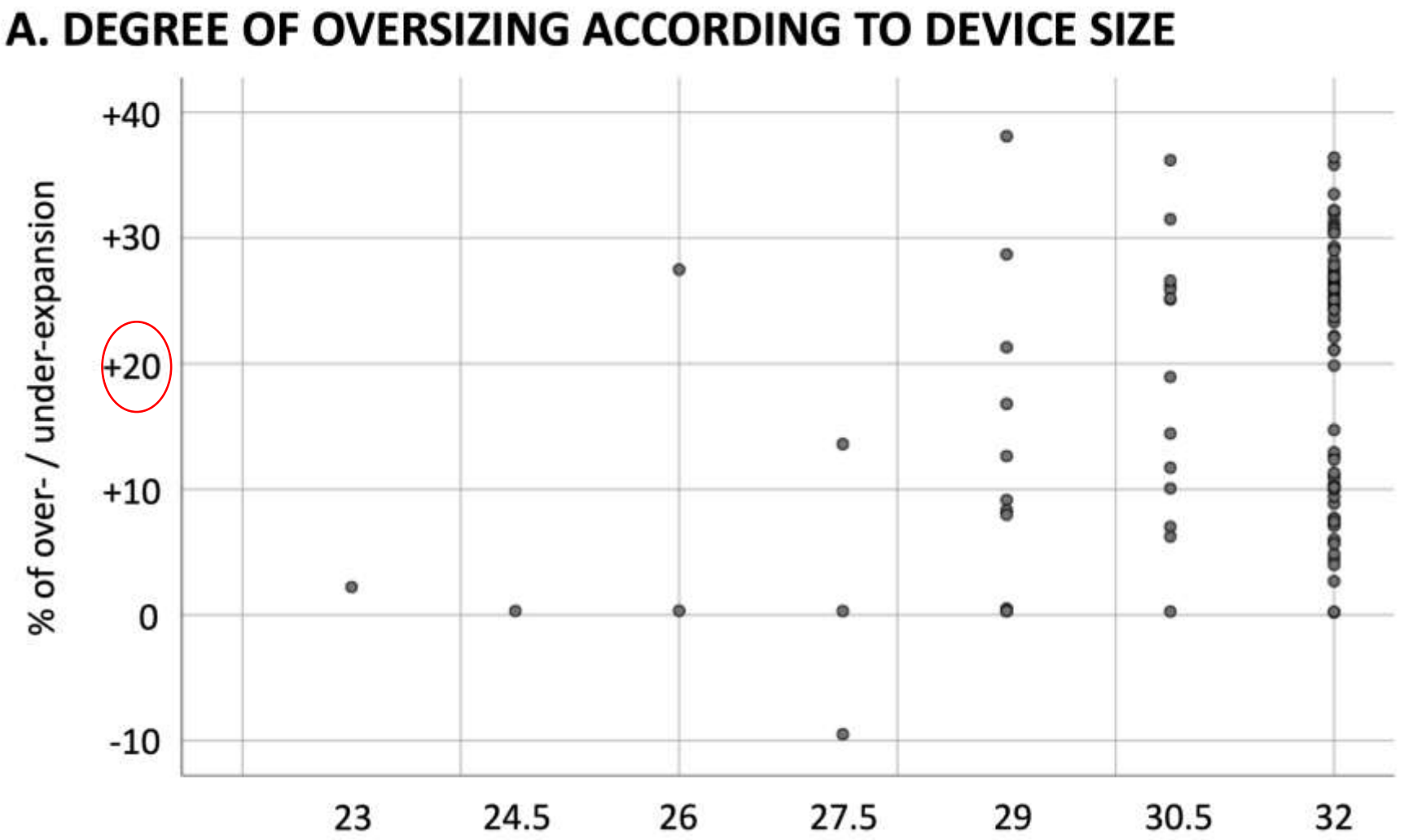
RANGE OF EXTRA-CC: 0 – 10 cc



PURE STUDY

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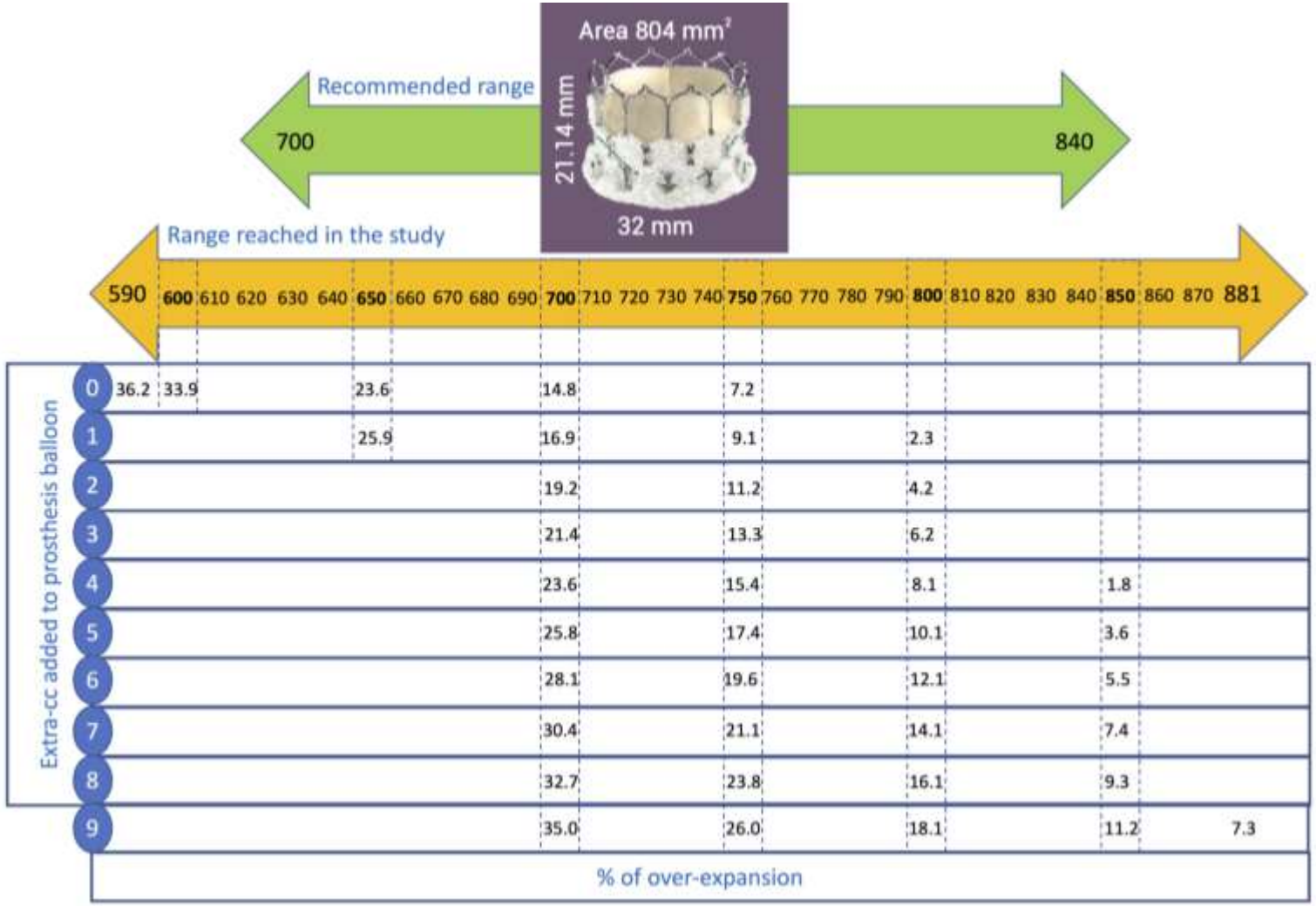
32 mm Valve



PURE STUDY

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OUTCOMES

30-d Mortality

9.5%

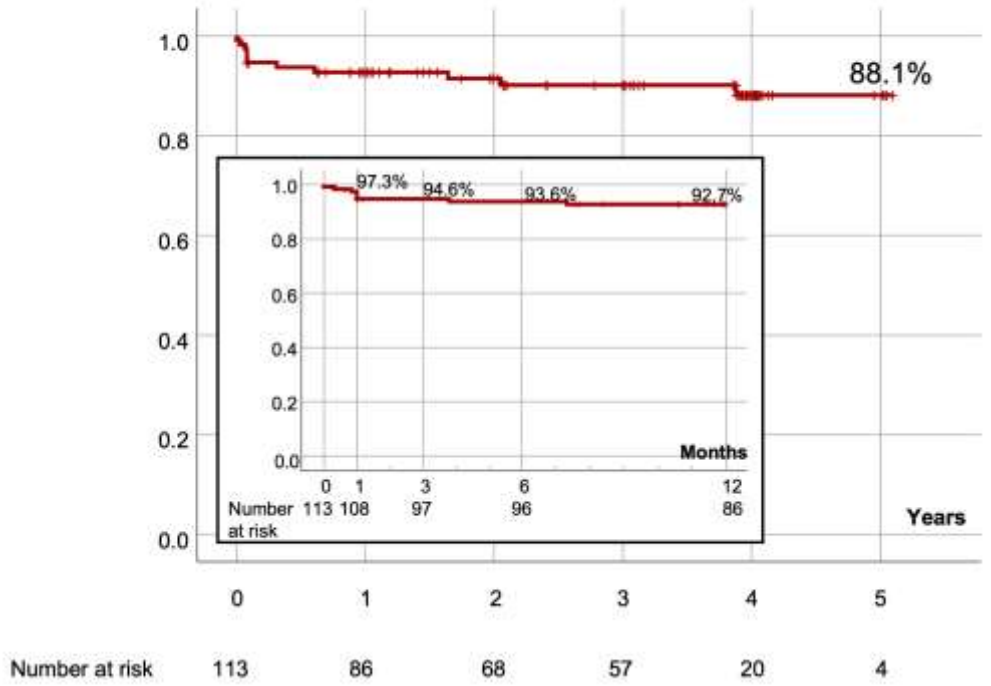
6.7%

≥ Moderate AR

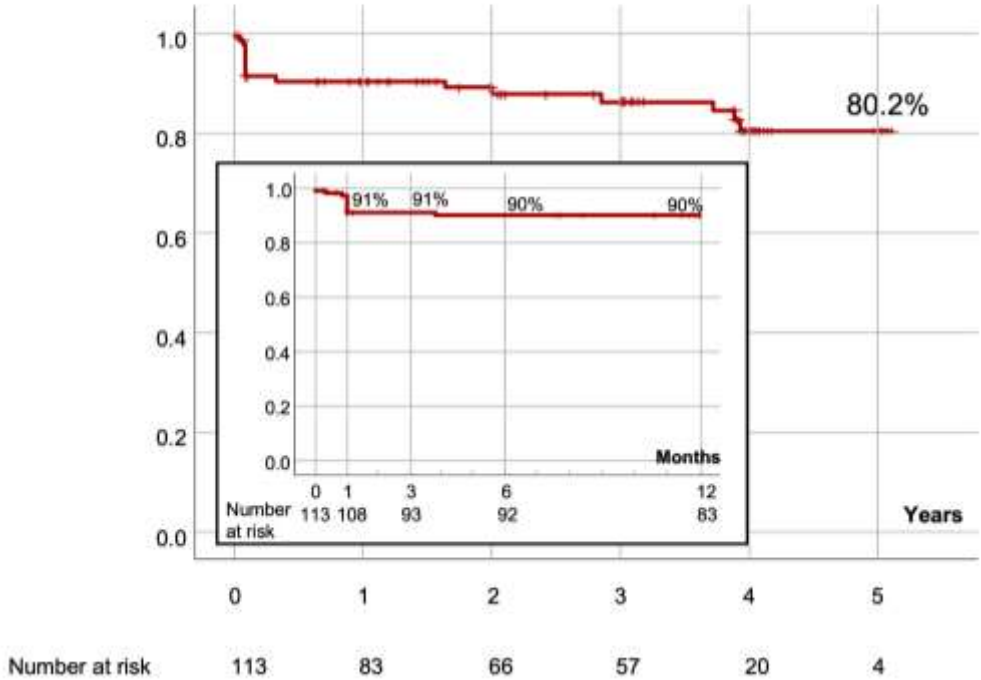
7.4%

3.9%

A. All-cause mortality



B. All-cause mortality + Re-Hospitalization

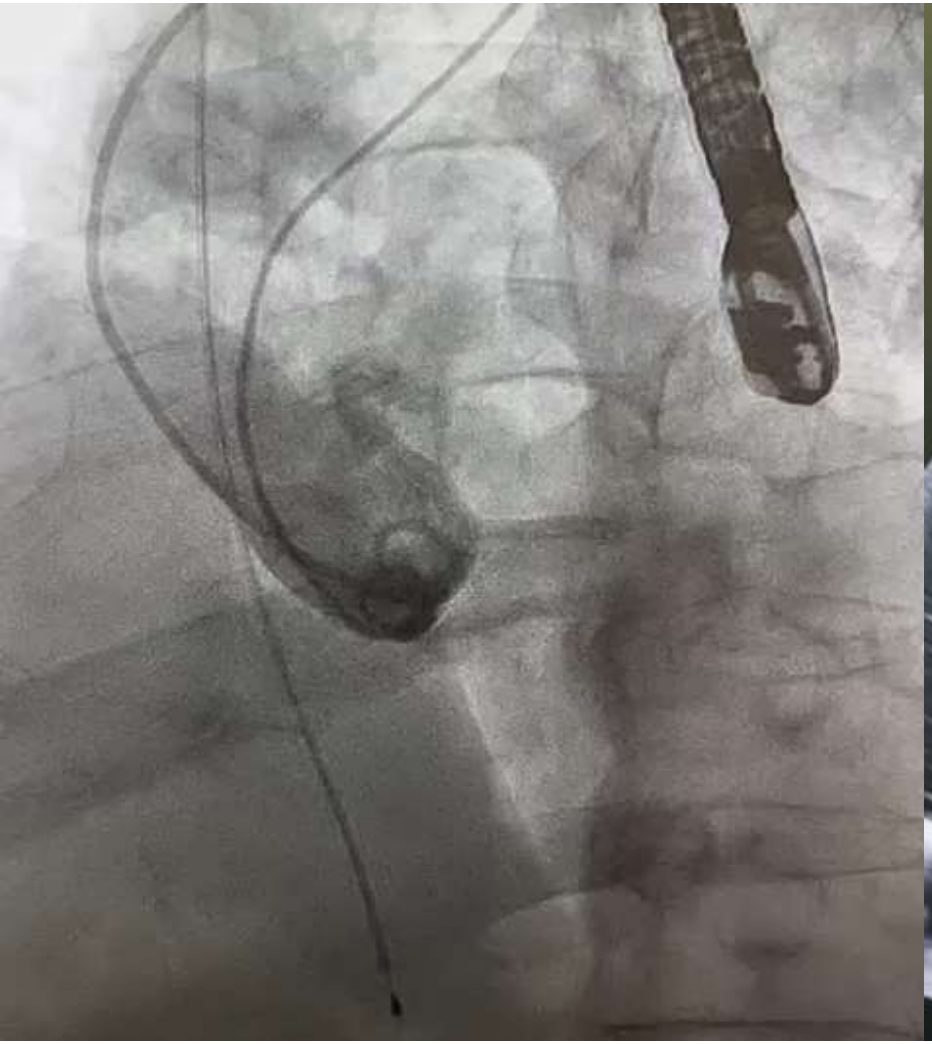


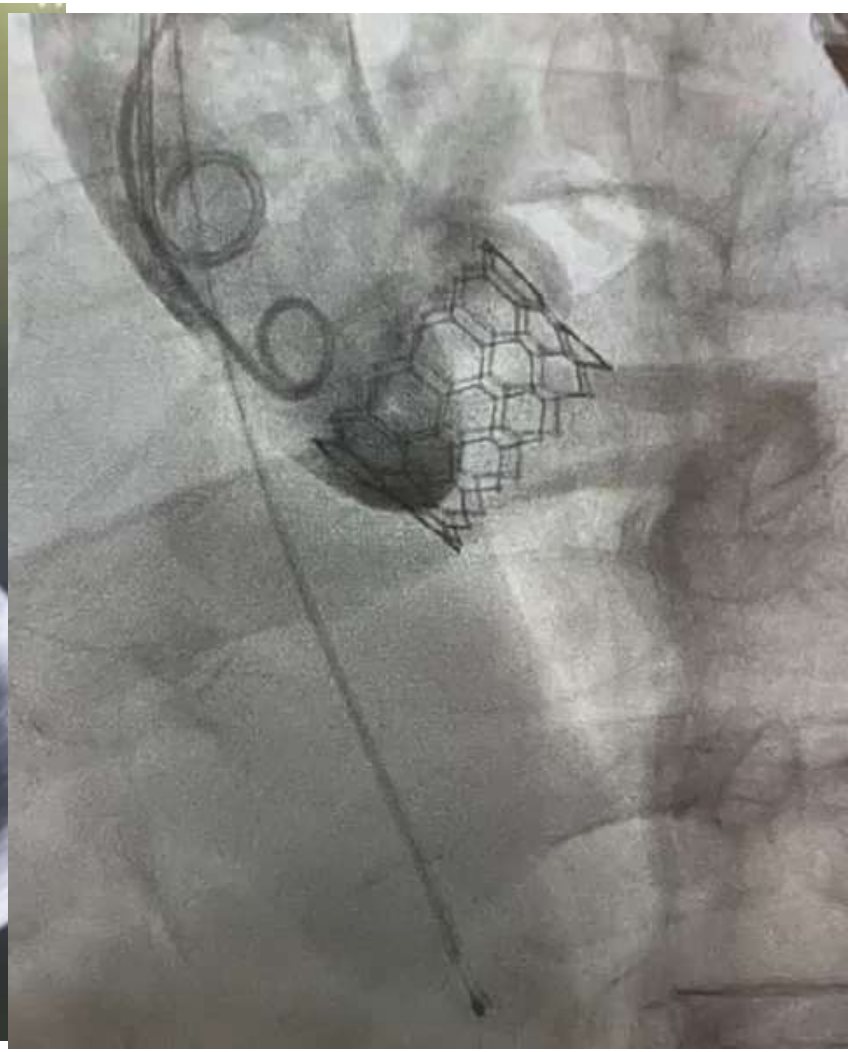
PURE STUDY

Just accepted in Eurointevention

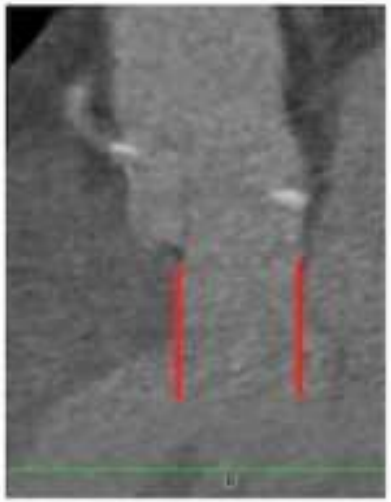
ICICOR

MYVAL 32+ 3cc. PREVENT DISLODGEMENT → PUT ALL VOLUME IN !!



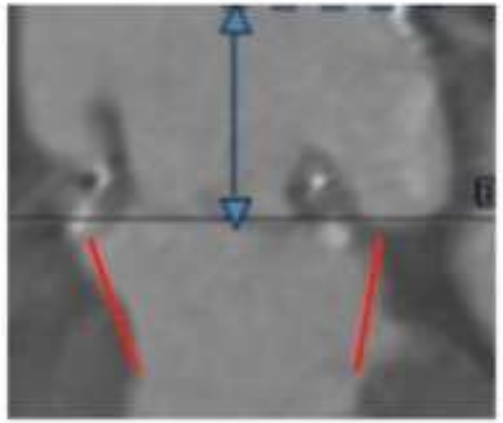


TUBULAR (12.4%)
Codominant (annulus – LVOT)
(Sizing based on the annulus)



EMBOLIZATION RATE: 0%

FLARED (58.4%)
Annular dominant
(Sizing based on the annulus)



EMBOLIZATION RATE: 0%

TAPERED (28.3%)
LVOT dominant
(Sizing based on the LVOT)

EMBOLIZATION RATE: 12.5%

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Other anatomical subgroups

- **Extreme iliac or aortic tortuosity**, in which a flexible delivery system such as Navitor or Acurate neo may be advantageous

- **Small iliofemoral vessels**, in which a low-profile 14-F Evolut R/Navitor/Myval may be favorable

- **Mechanical mitral valve** replacement and **marked septal bulge**, in which a self-expanding prosthesis may be preferred

FINAL REFLECTIONS

- **Most patients** can be successfully treated with **any valve type**
- Each operator **balance** between valve types and personal experience
- The **technical challenges** associated with different anatomic scenarios, along with the **strengths and weaknesses** of the various transcatheter aortic valves, will allow an **optimal valve** to be selected for each and every patient, minimizing complications and maximizing success