Sizing and Treatment of Low Risk Bicuspid Patients

Didier Tchétché, MD.

Clinique Pasteur, Toulouse, France

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Conflict of interest

-Consultant for

Abbott/Boston Sci/Edwards/Medtronic/4Tech/ T-Heart

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Patient selection for TAVI

Evolut Low Risk Bicuspid Study
Summary

- TAVI with Evolut supra-annular self-expanding valve in low-risk bicuspid patients (mean age 70.3±5.5 years) achieved excellent early results using consistent annular sizing:
    - 95.3% device success
    - Low mortality and stroke at 30 days (1.3%)
    - Consistent hemodynamics across Sievers Classification: mean EOA 2.3 cm2 at 30 days, mean gradient 7.6 mmHg, No moderate/severe AR, sevre PPM in 5.3%
- Patients will be followed for 10 years

Ramlawi et al

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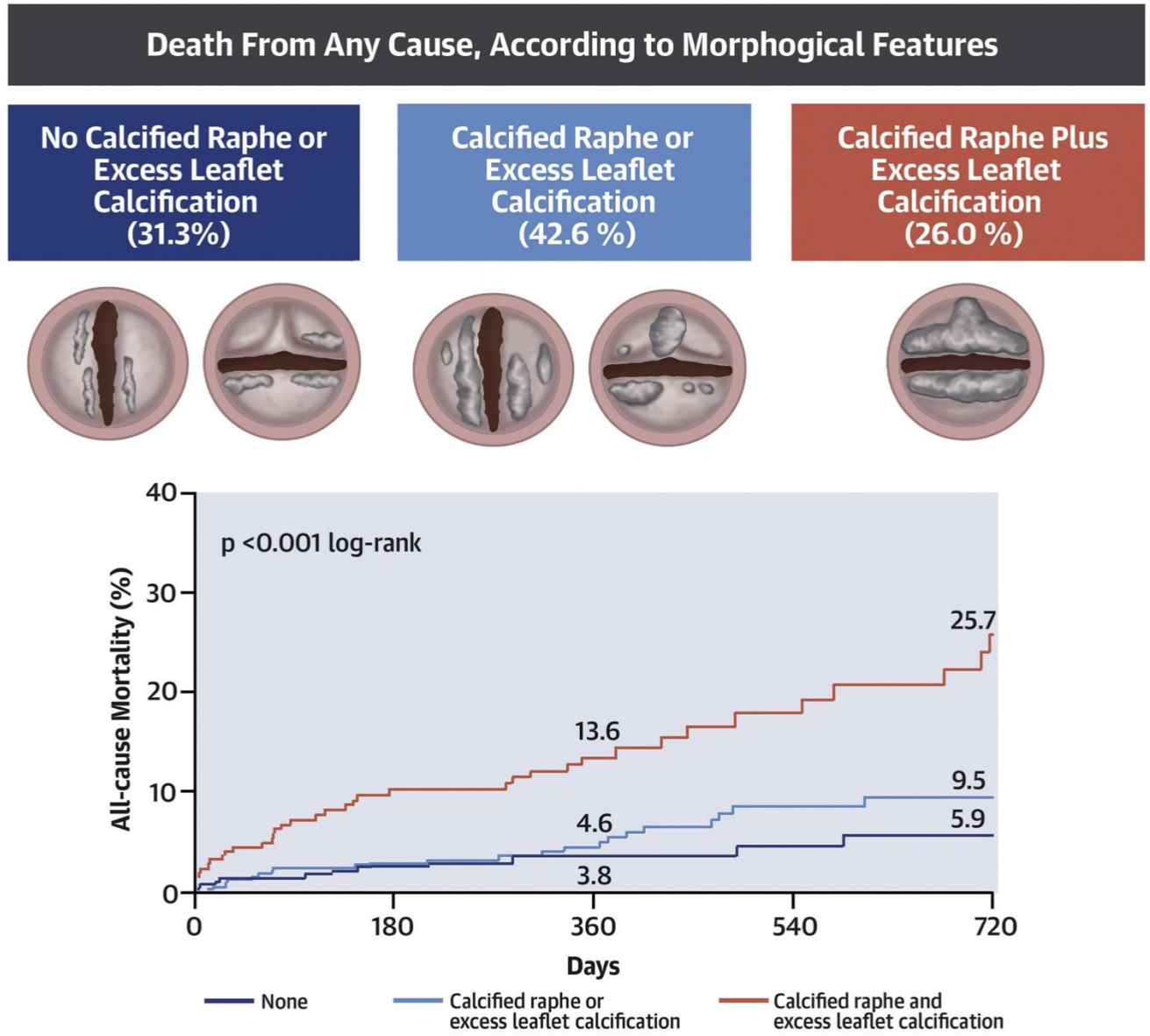
Transcatheter Aortic Valve Replacement in Low-Risk Bicuspid and Tricuspid Patients: Meta-Analysis

Giorgio A Medranda [1], Toby Rogers [2], Gheorghe Doros [1], Cheng Zhang [1], Brian C Case [1], Charan Yerasi [1], Christian C Shults [3], Ron Waksman [4]

Conclusions: Preliminary data from the FDA-approved IDE trials of low-risk patients with bicuspid AS undergoing TAVR demonstrated 30-day outcomes comparable to low-risk tricuspid patients, except for a trend toward higher stroke in bicuspid patients. Randomized trials are warranted to reassure the safety and long-term outcome of TAVR in patients with severe bicuspid AS.

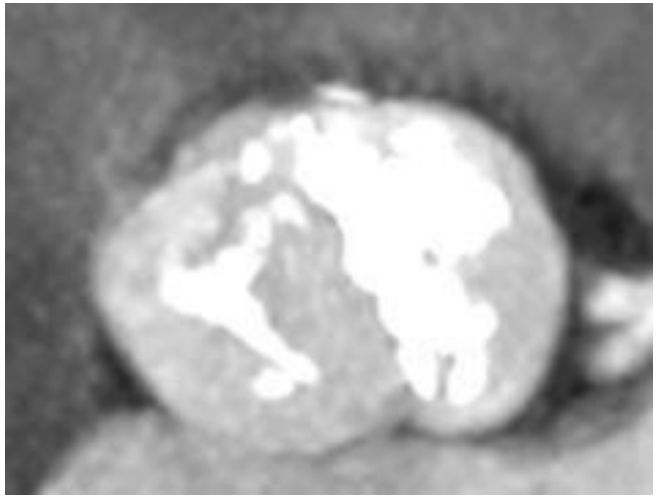
CENTRAL ILLUSTRATION: Death From Any Cause According to Morphological Features

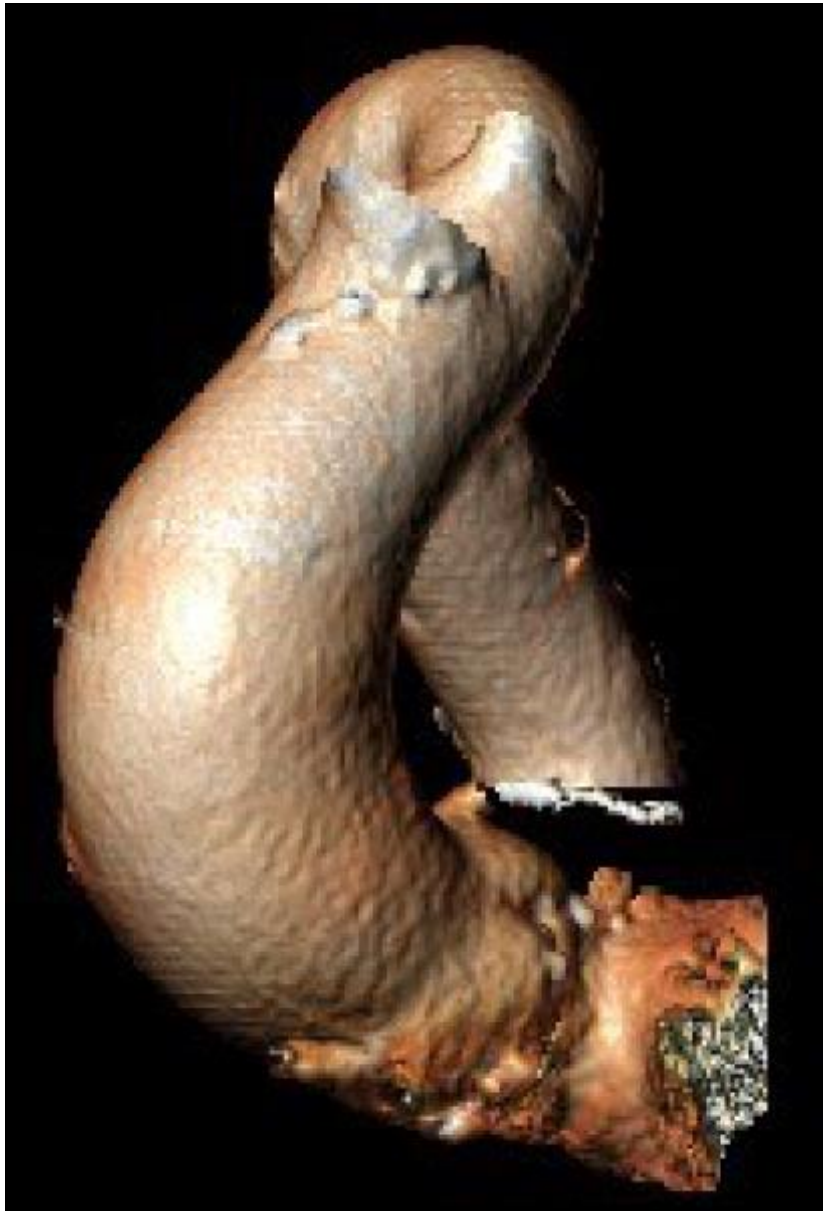


Yoon, S.-H. et al. J Am Coll Cardiol. 2020;76(9):1018–30.

Anatomical differences with tricuspid aortic valves

- XL Annulus sizes
- XL Sinus height and width
- Heavy calcifications
- **Widened ascending aorta**
- Higher coronary take-off
- Coronary ostium closer to commissure





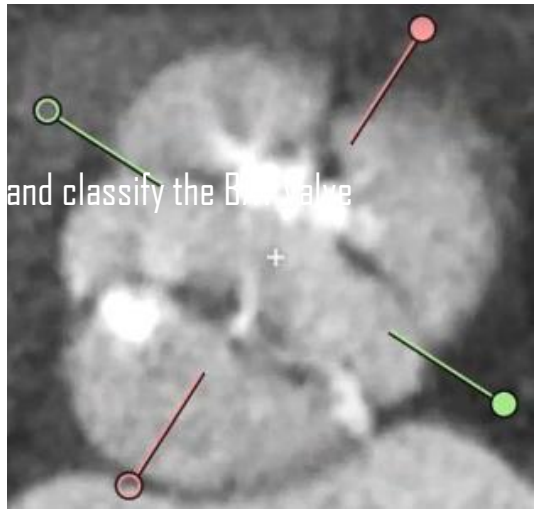
Sizing for BAV

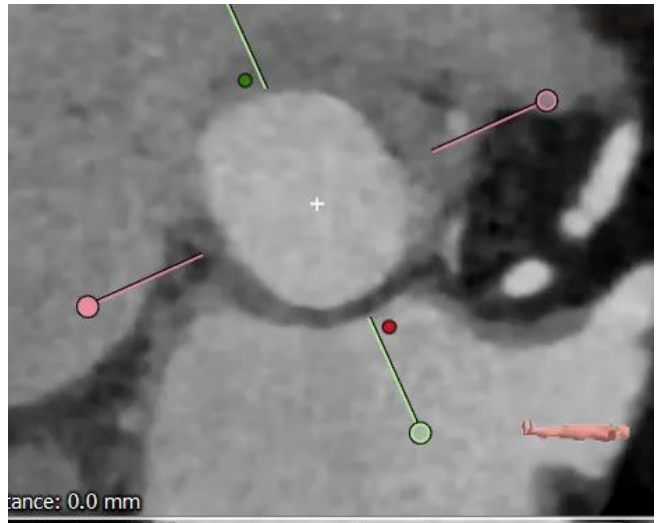
CT scroll technique: the reference

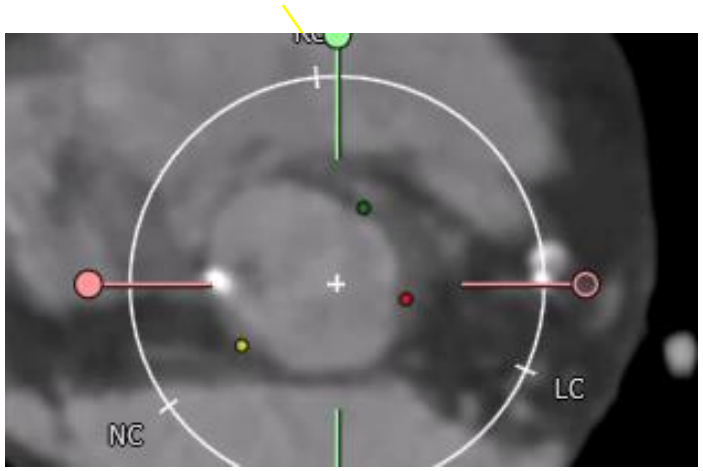
- **In mid-systole, identify the basal annular plane** and slowly scroll up and down from the annulus to above the sinuses of valsalva.

- Supra-annular measurements standardized at +4 mm **(BAVARD registry): ICD and tracing**

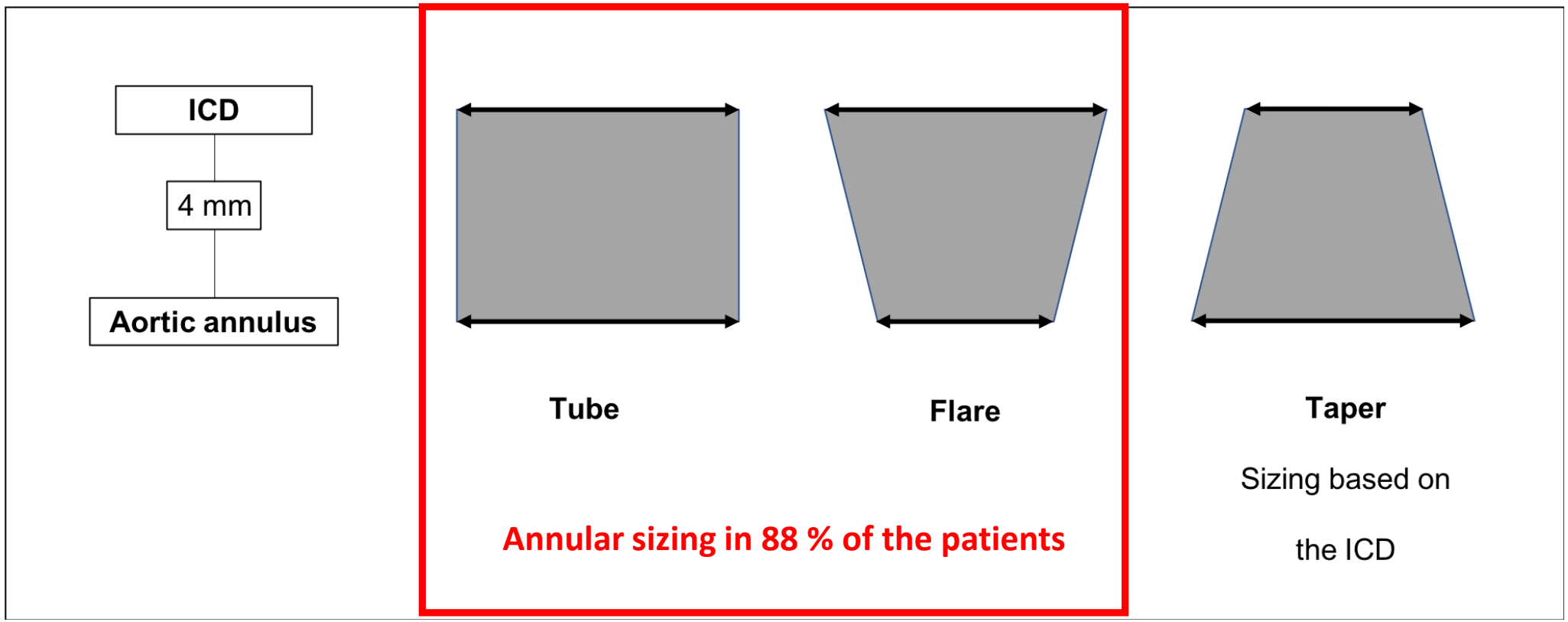
- Examination of the images can identify the following:
  - Location and morphology of cusps and leaflets
  - Presence of any raphe between leaflets
  - Extent and distribution of calcium
  - Location of coronary arteries
  - Size and shape of supra-annular EOA







BAVARD sizing strategy according to the landing zone configuration



Tchetche et al., Circulation: Cardiovascular Interventions. 2019;12

Retrospective and simplified CT Sizing utilized in the BAVARD registry

Mean prosthesis-annulus ratio:

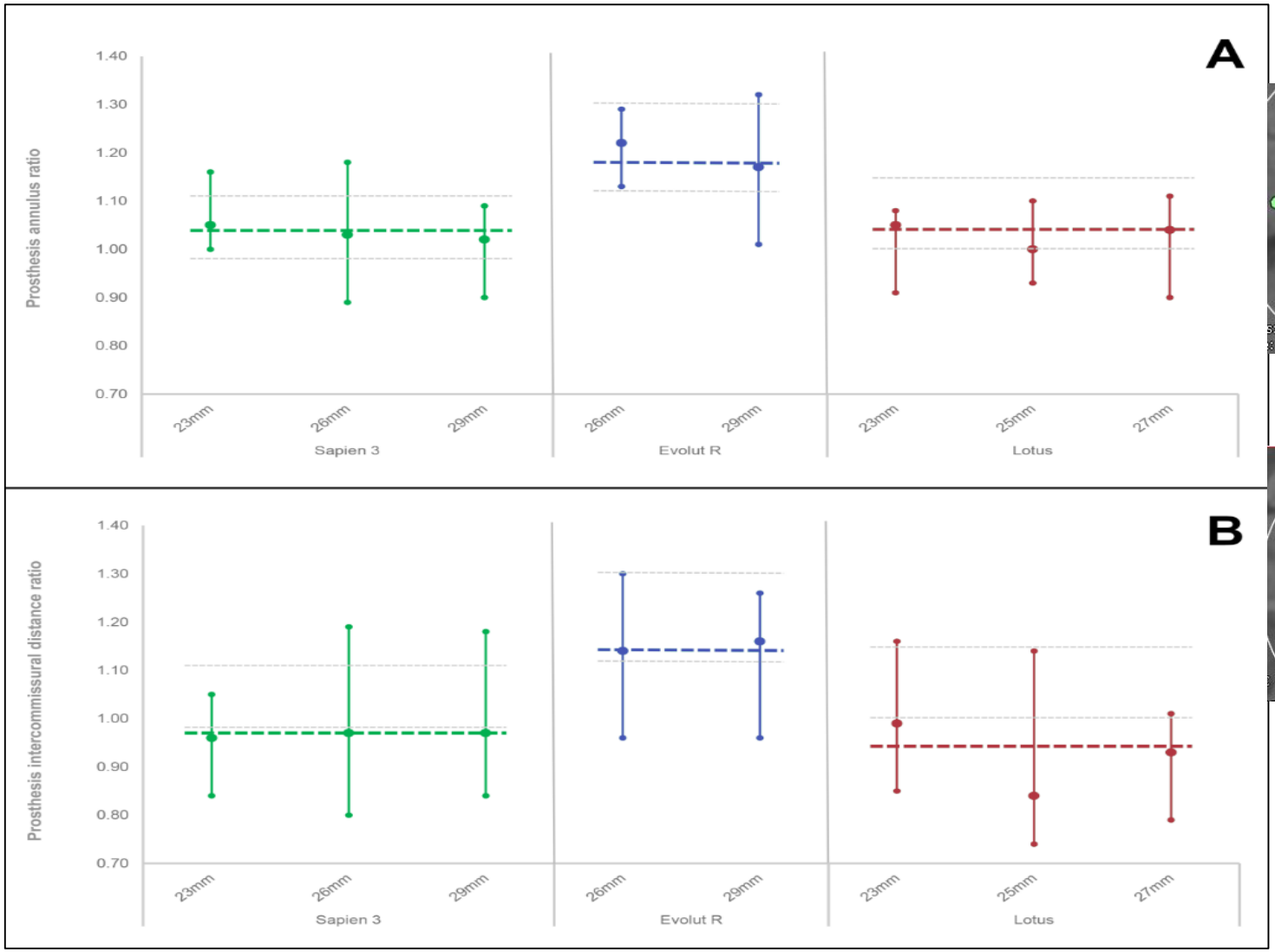
1.037±0.09 (BAV)

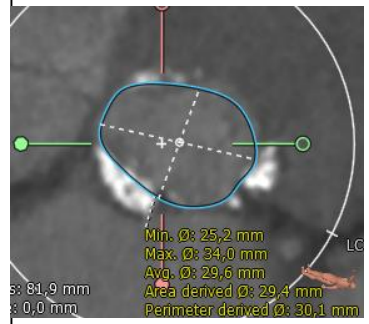
vs

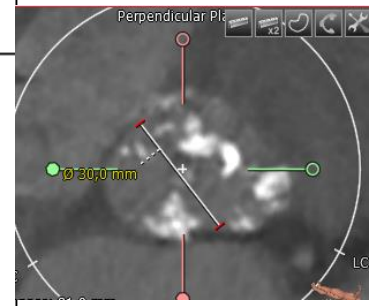
1.14±0.09 (TAV)

Mean prosthesis-ICD ratio:

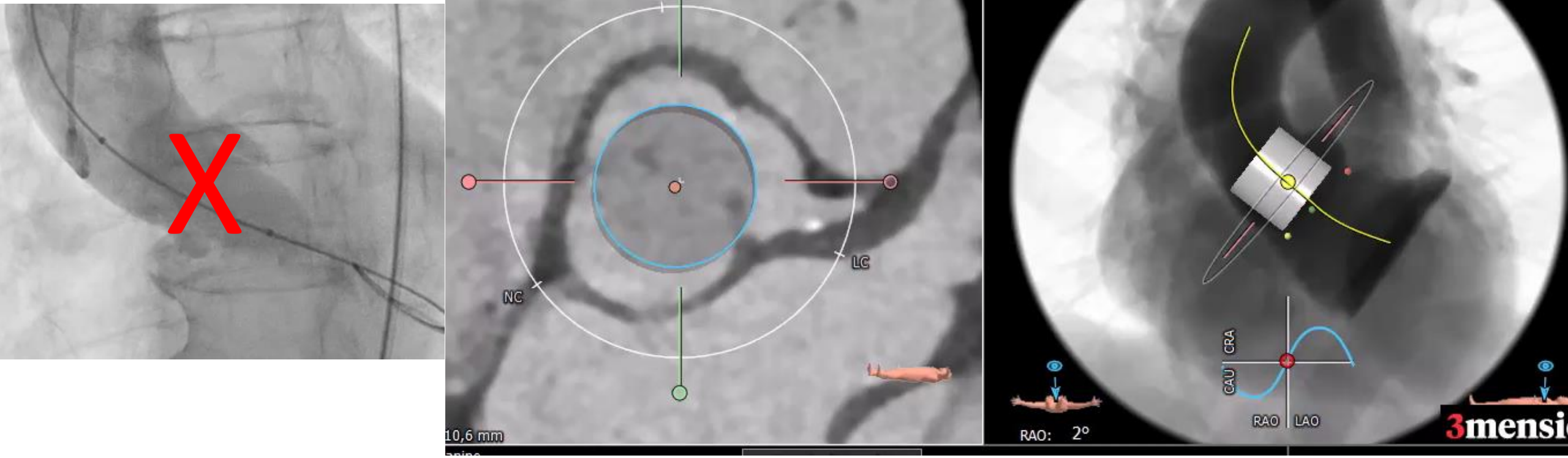
1.032±0.11 (BAV)



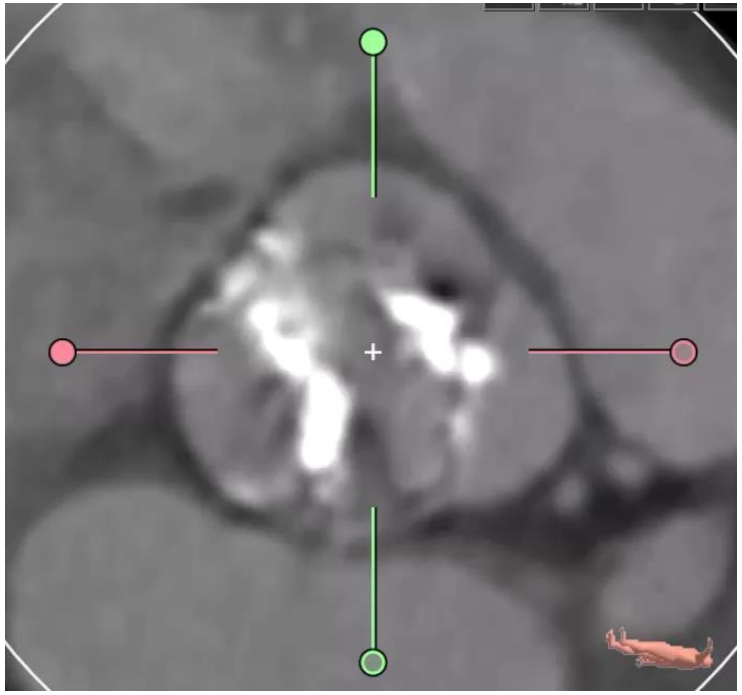


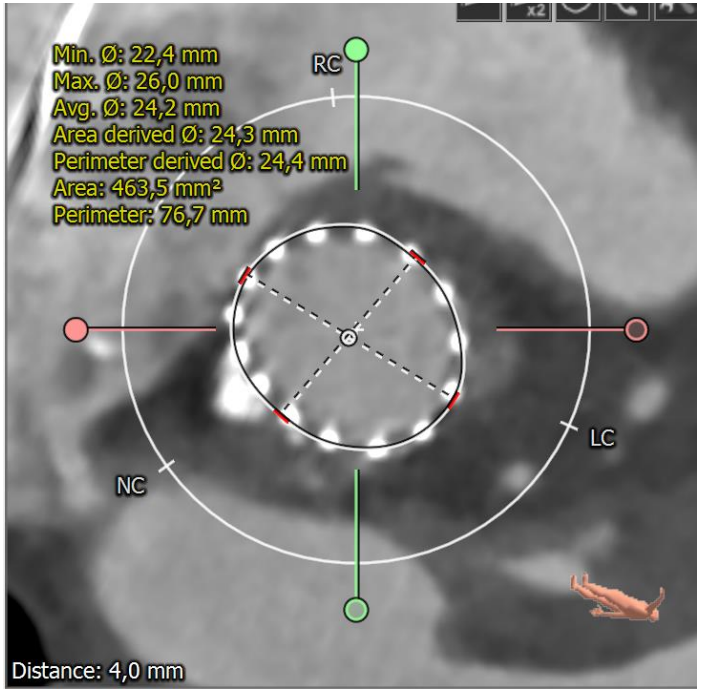


CT Assessment: circle method-23 Sapien 3



Supra-annular tracing: anticipating the final THV diameter





Premieter-derived diam at baseline seems to correlate with post implant prosthesis mean diameter

De biase C, Tchetche D et al, under review

Key messages for sizing in bicuspid anatomies:

-CT sizing is the gold standard

-Annulus-based sizing is efficient in about 90% of BAV patients

-Supra-annular sizing recommended for understanding of the landing zone configuration

-Circle method for BEV

-Be cautious in tapered configurations and extremely calcified anatomies

-Avoid excessive oversizing:

-constant underexpansion or devices about 10-15% as compared to annular dimension

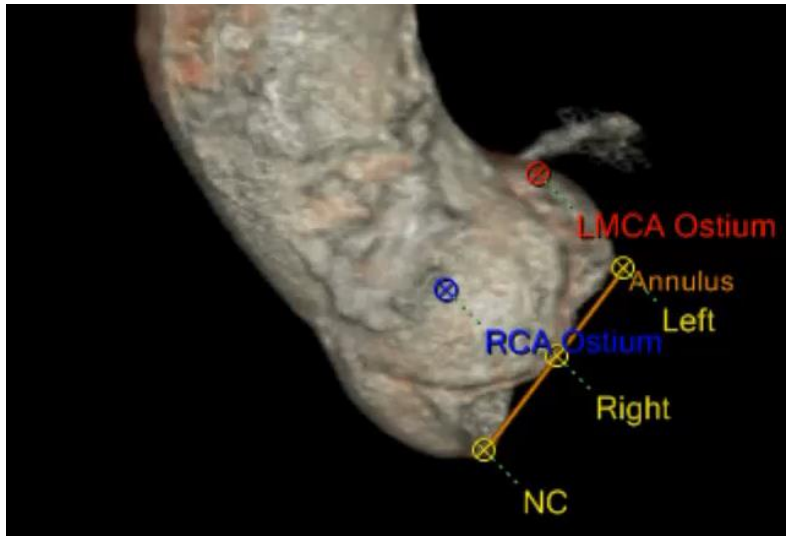
-aggressive oversizing may lead to complications

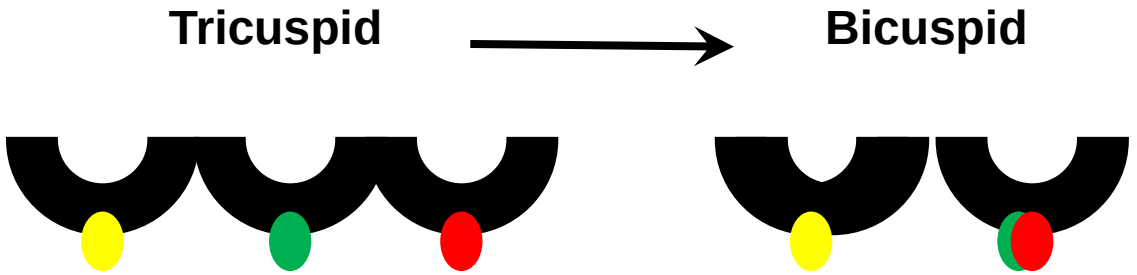
Procedural considerations

TAVI in Bicuspid

procedural considerations

- Implanter's view – <u>2 cusp view</u>





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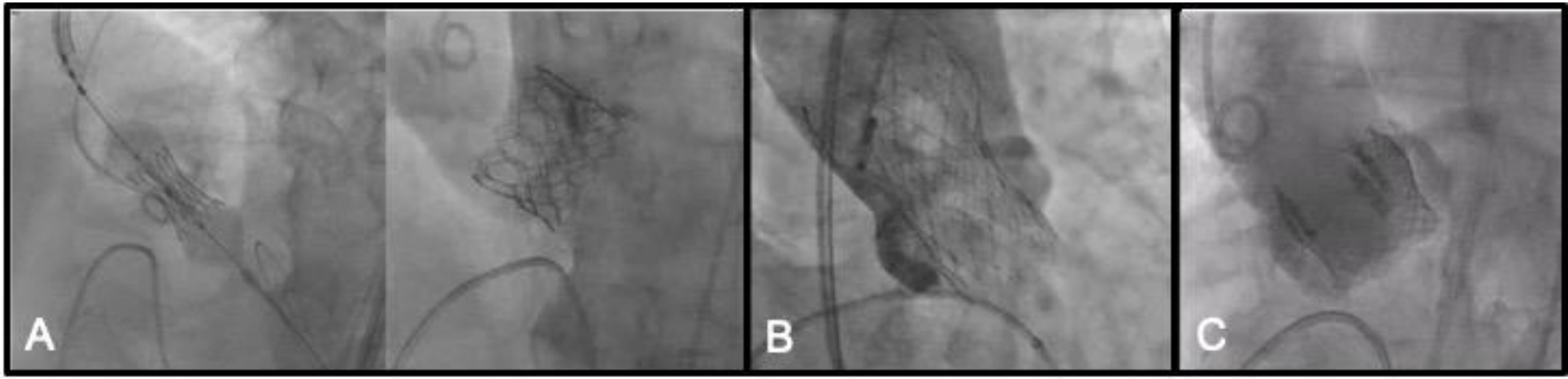
Higher implant depth

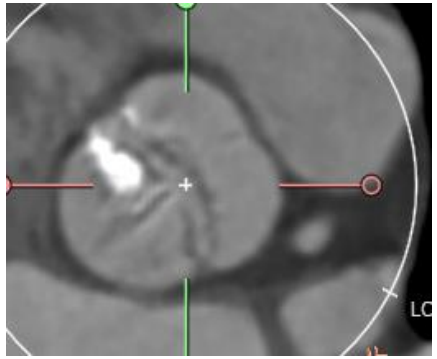


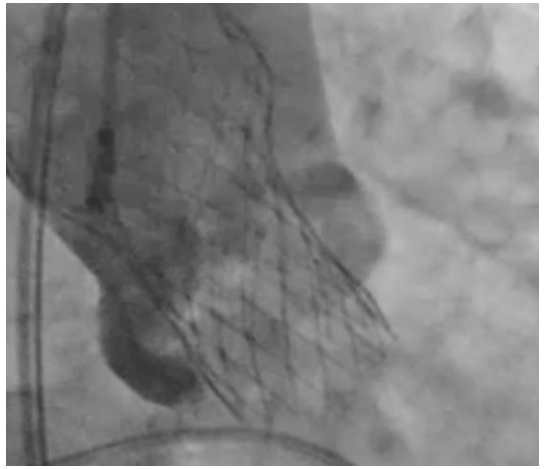
Procedural details

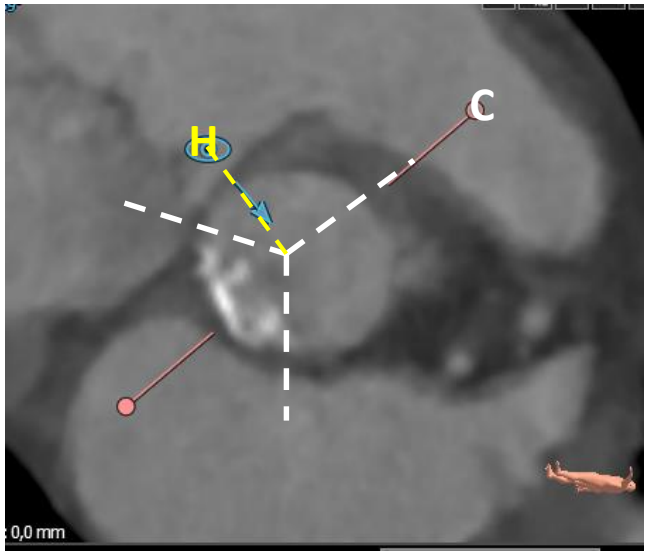
Tchetche et al,
presented #e-PCR 2020

Procedural data	N = 151	Annular sizing N = 78	Combined sizing N = 73	P value
Valve size				
Evolut PRO 26, n (%)	20 (13.2)	10 (13.2)	10 (13.7)	0.7
Evolut PRO 29, n (%)	**70 (46.4)**	33 (43.4)	35 (47.9)	
Evolut R XL 34, n (%)	**54 (35.8)**	28 (36.8)	26 (35.6)	
Number of valve used				
1, n (%)	**145 (97)**	72 (94.7)	71 (98.6)	0.2
2, n (%)	3 (2.0)	3 (3.9)	0 (0)	
Repositioning, n (%)	**45 (29.8)**	20 (26.3)	25 (34.2)	0.4
Predilatation, n (%)	**131 (86.8)**	66 (86.8)	65 (89)	0.8
Size of balloon, median (IQR)	23 (22-24)	23 (22-24)	23 (21-24)	-
Postdilatation, n (%)	**83 (55)**	42 (55.3)	40 (54.8)	1
Size of balloon, median (IQR)	25 (23-28)	25 (23-27)	25 (23-28)	-
Procedural mortality, n (%)	1 (0.7)	0 (0)	1 (1.4)	0.5

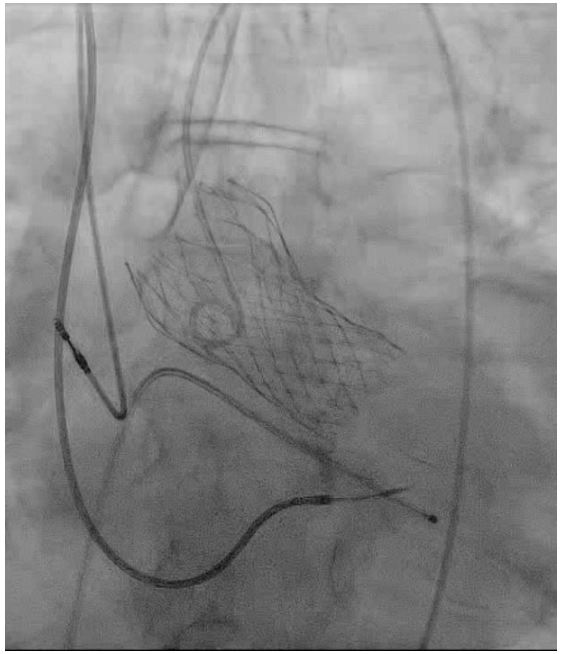
Type 1 LR bicuspid: commissure aligned with raphe

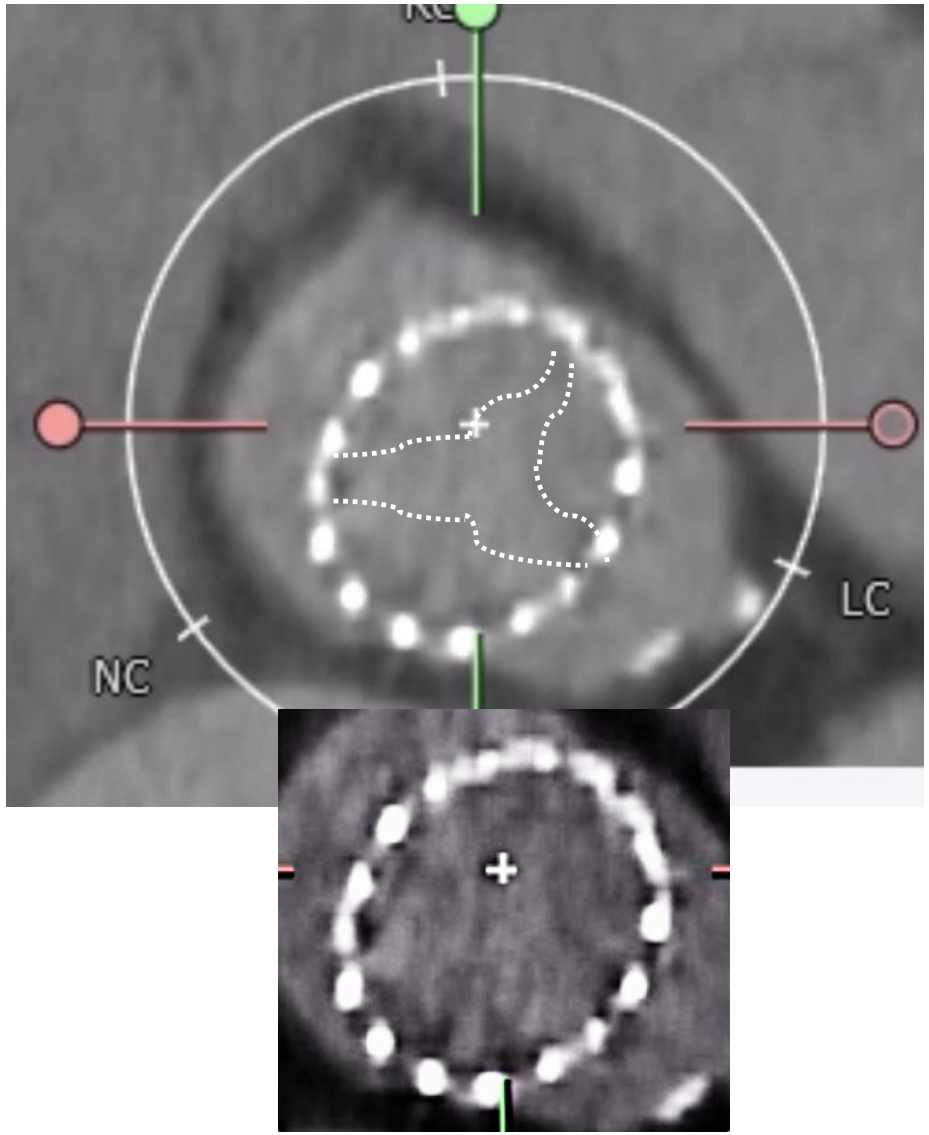




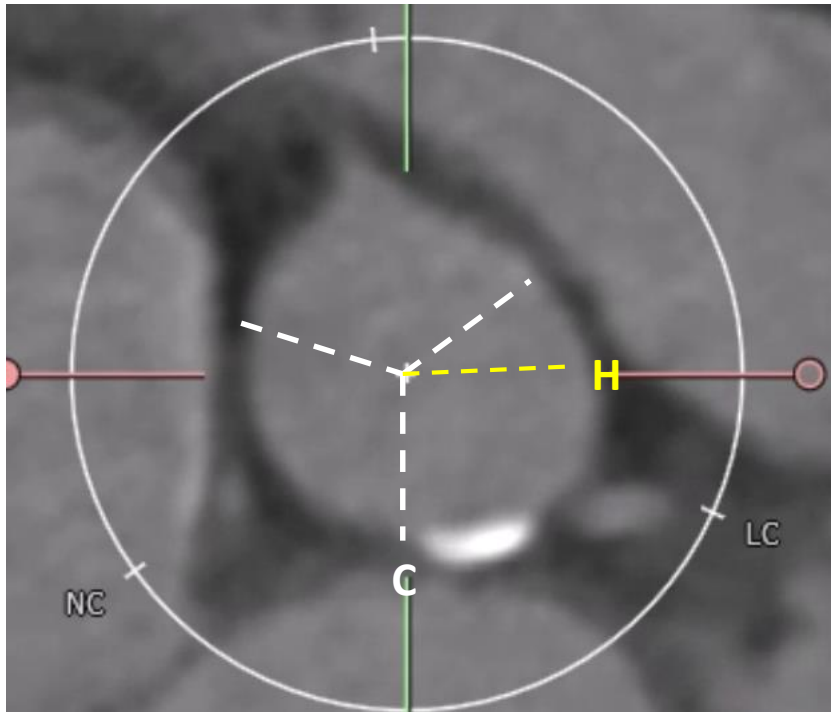


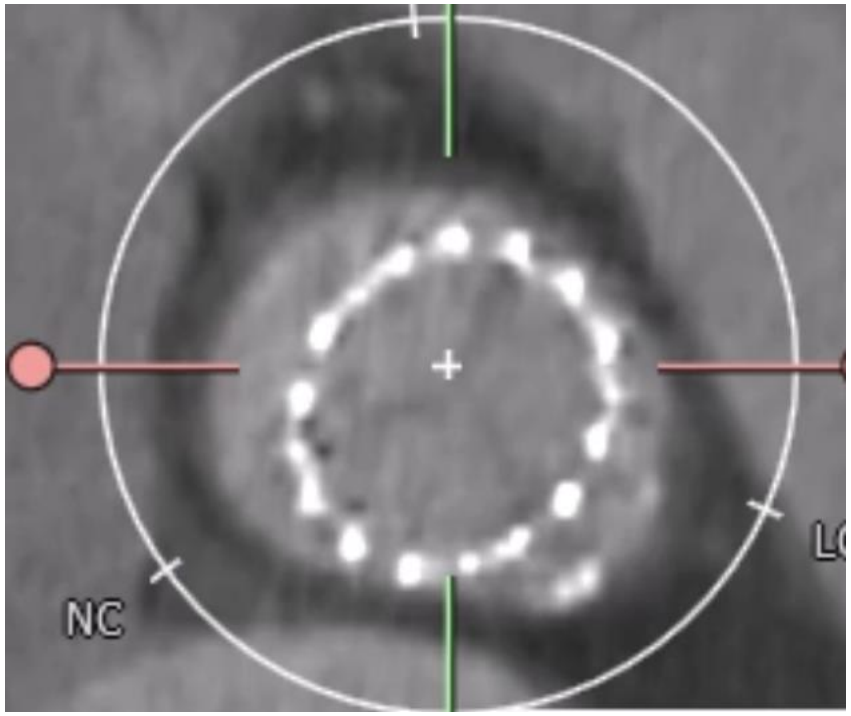
Non type I LR bicuspid: higher risk of misalignment



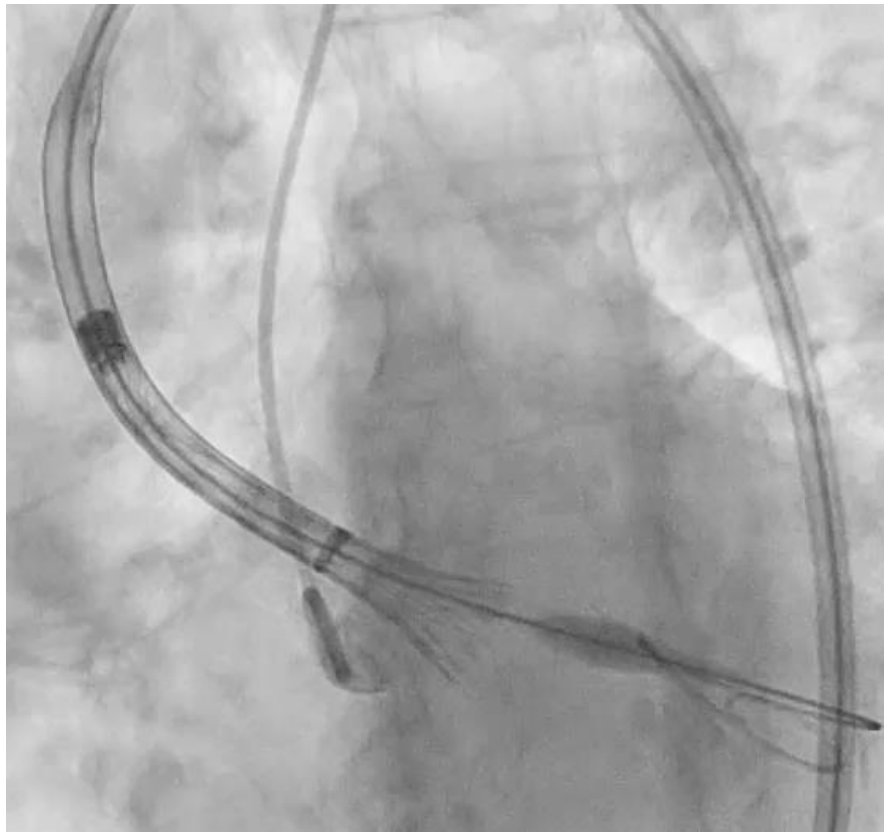


Evolut Pro in type 1 RN





Evolut Pro in type 1 RN: flush port at 8-9 O'clock



Key messages about TAVI techniques for bicuspid valves

- **2 cusps view**
- **Predilate: minor diameter of the annulus**
- **Commissural alignment**
- **High implants, remaining across the annulus (reposition SEV if necessary)**
- **Assess stent frame expansion in two orthogonal views**
- **Postdilate if necessary: frame optimization**

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MERCI

THANK YOU

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GRACIAS

谢x谢

OBRIGADO

GRAZIE

BEDANKT

DEKUJI

Спасибо

EFHARISTO