TAVI

Le traitement de choix pour les bicuspidies ?

Dr Nicolas Dumonteil
Clinique Pasteur
Toulouse

DÉCLARATION DE LIENS D'INTÉRÊT AVEC LA PRÉSENTATION

Nom de l'orateur : Nicolas DUMONTEIL, Toulouse

☑ Je déclare les liens d'intérêt potentiel suivants :

Consultant/Proctor :

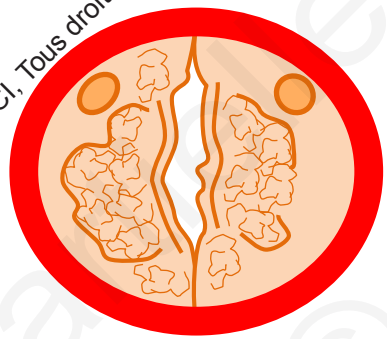
Abbott, Ancora Heart, BOSTON, EDWARDS, Medtronic

General considerations

Abnormal aortic valve morphology consisting of 2 functional cusps with less than 3 zones of parallel apposition between cusps

Type 0

No raphe



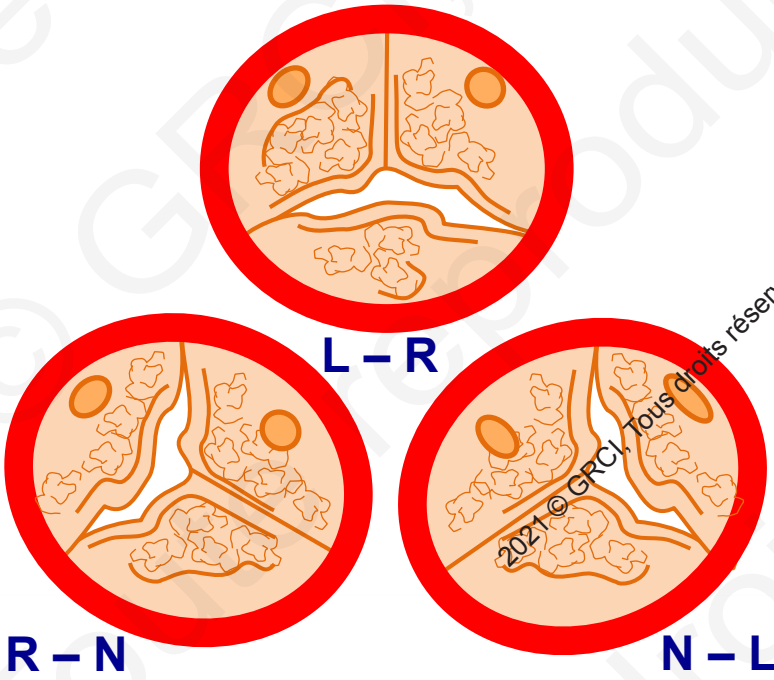
Sievers HHC et al. ***J Thorac cardiovasc Surg.*** 2007;133

General considerations

Abnormal aortic valve morphology consisting of 2 functional cusps with less than 3 zones of parallel apposition between cusps

Type 1

One raphe



Sievers HHC et al. ***J Thorac cardiovasc Surg.*** 2007;133

General considerations

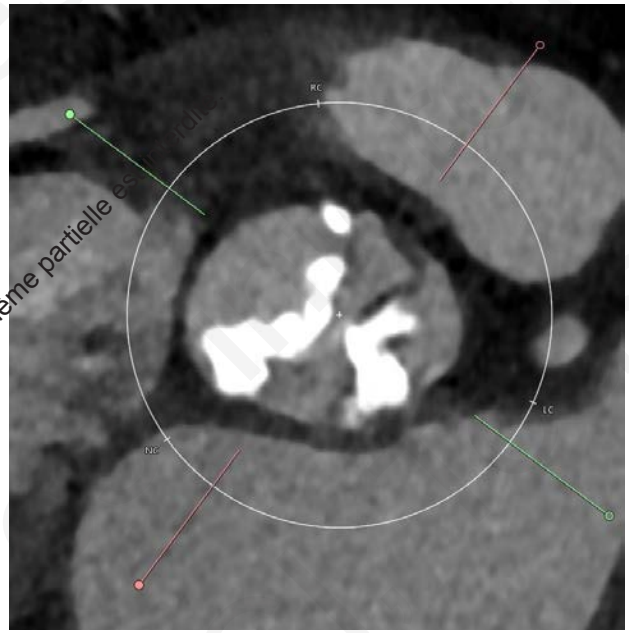
Abnormal aortic valve morphology consisting of 2 functional cusps with less than 3 zones of parallel apposition between cusps

Type 2
Two raphe

L – N / R – N

Sievers HHC et al. ***J Thorac cardiovasc Surg.*** 2007;133

QUE SAIT-ON ?



Bicuspid Aortic Valves (BAV) **excluded**

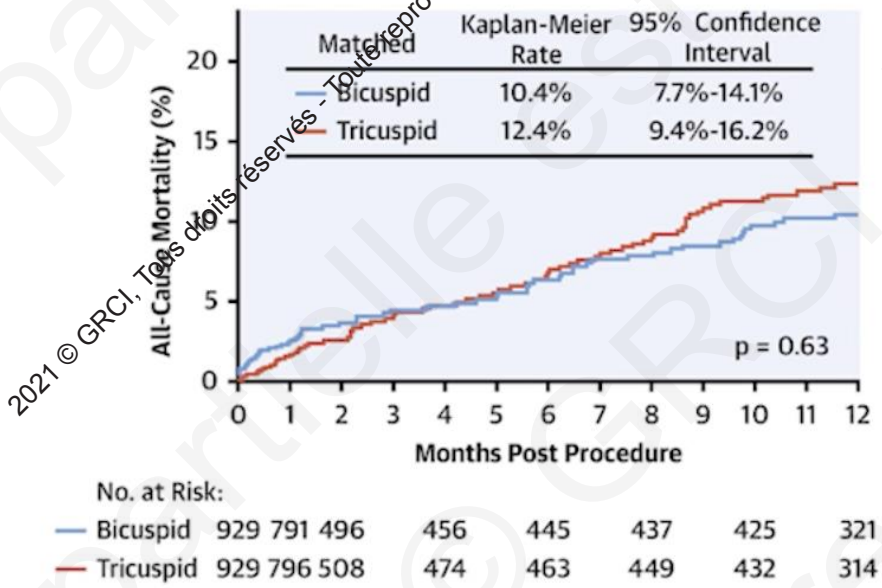
from the landmark clinical trials

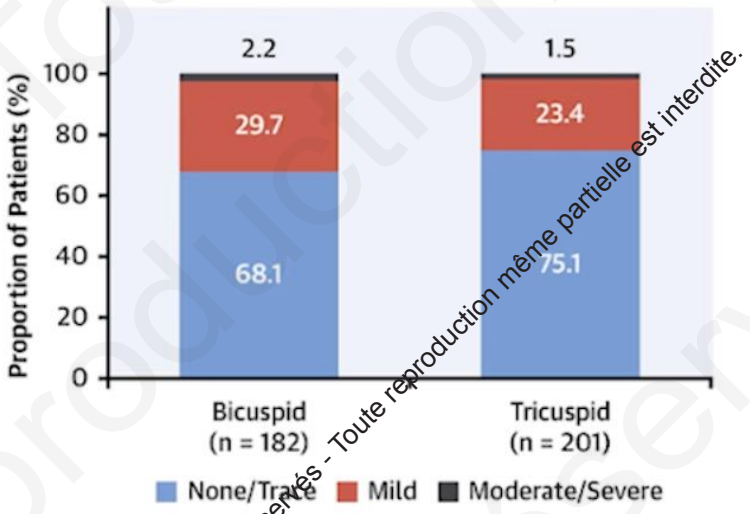
that have validated TAVI

Comparaison TAVI dans Vao bicuspides Vs tricuspides

Résultats ≈ équivalents chez patients à risque intermédiaire

CENTRAL ILLUSTRATION: Key Outcomes

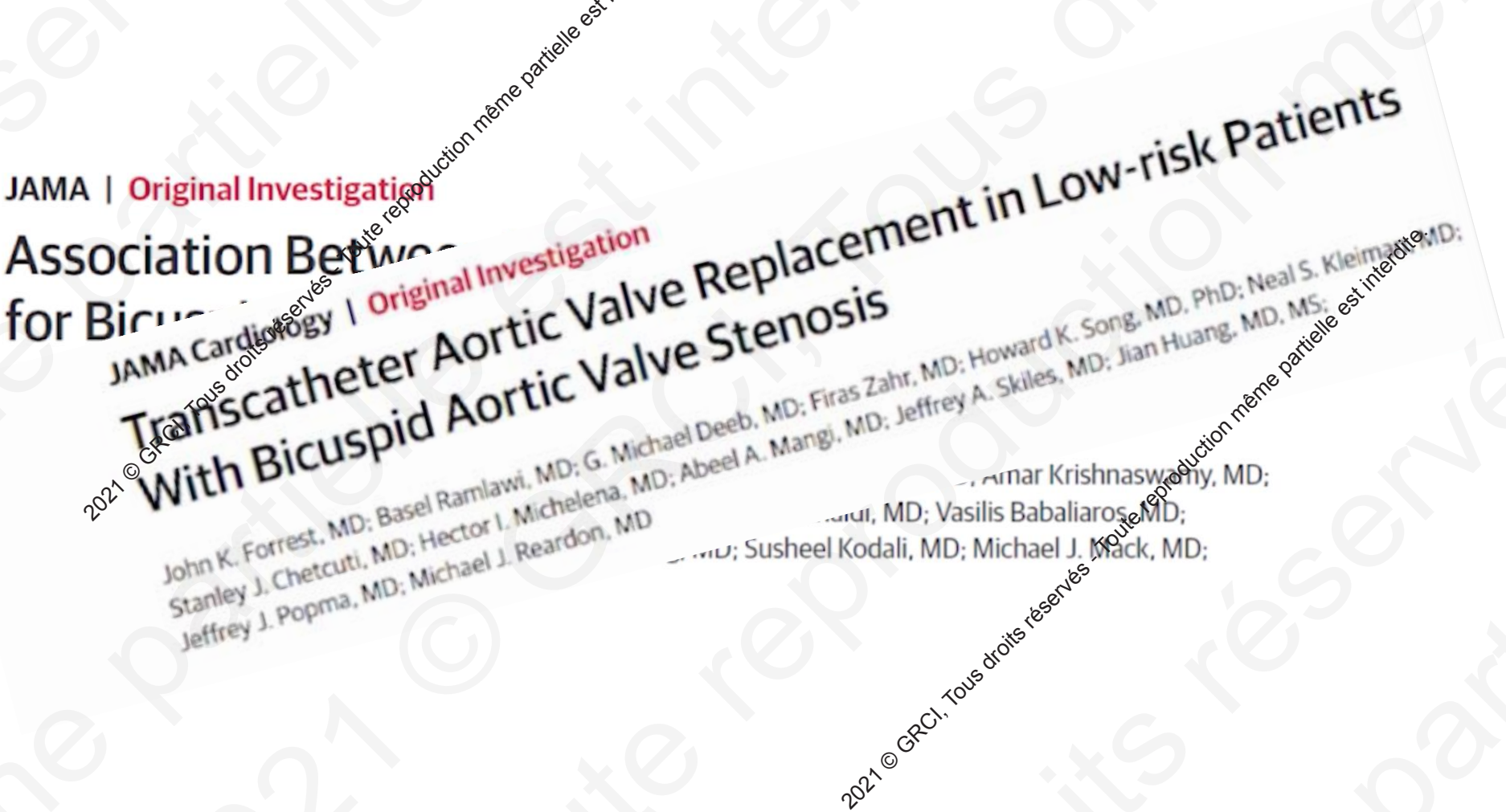




Forrest, J.K. et al. J Am Coll Cardiol Intv. 2020;13(15):1749-59.

Comparaison TAVI dans Vao bicuspides Vs tricuspides

Résultats ≈ équivalents chez patients à bas risque



JAMA | Original Investigation

Association Betwe
for Bicu

JAMA Cardiology | Original Investigation

Transcatheter Aortic Valve Replacement in Low-risk Patients With Bicuspid Aortic Valve Stenosis

John K. Forrest, MD; Basel Ramlawi, MD; G. Michael Deeb, MD; Firas Zahr, MD; Howard K. Song, MD, PhD; Neal S. Kleiman, MD; Stanley J. Chetcuti, MD; Hector I. Michelena, MD; Abeel A. Mangi, MD; Jeffrey A. Skiles, MD; Jian Huang, MD, MS; Jeffrey J. Popma, MD; Michael J. Reardon, MD

Arnar Krishnaswamy, MD; ...di, MD; Vasilis Babaliaros, MD; ...MD; Susheel Kodali, MD; Michael J. Mack, MD;

QUE SAIT-ON ?

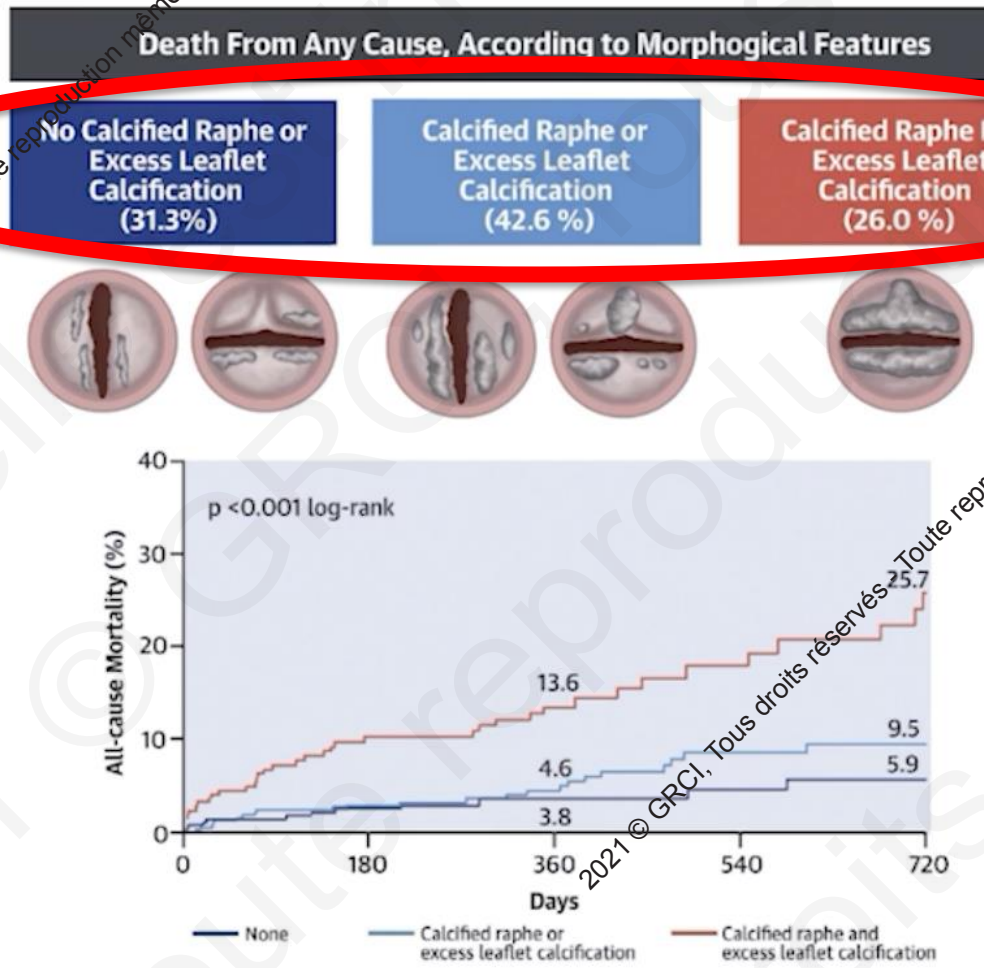
Comparaison TAVI dans Vao bicuspides Vs tricuspides

Résultats ≈ équivalents

Dans des anatomies sélectionnées favorables au TAVI

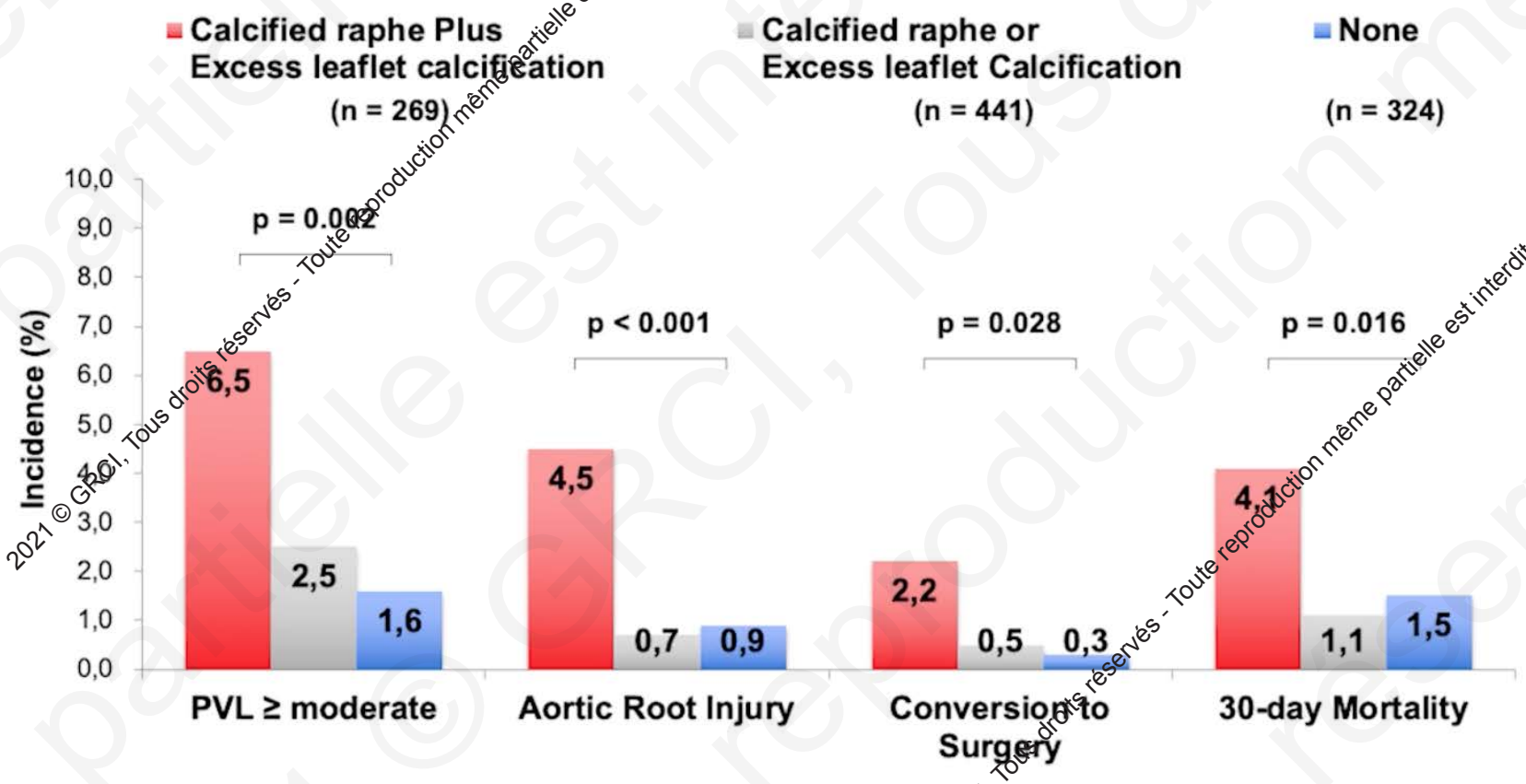
NOTION DE RISQUE ANATOMIQUE DU TAVI / BICUSPIDIES

CENTRAL ILLUSTRATION: Death From Any Cause According to Morphological Features



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

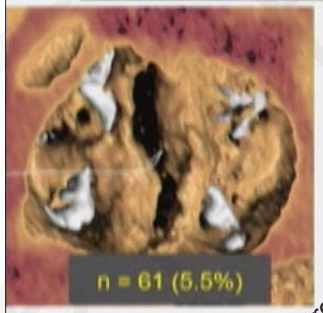
NOTION DE RISQUE ANATOMIQUE DU TAVI / BICUSPIDIES

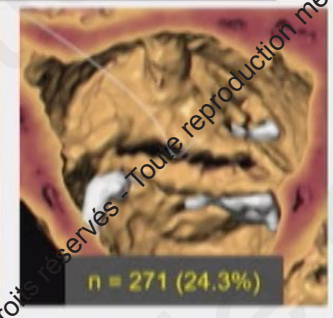


Yoon, S.-H. et al. J Am Coll Cardiol. 2020;76(9):1018-30.

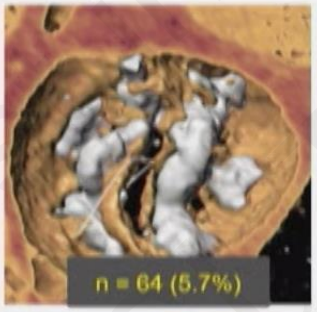
Cedars-Sinai site-initiated multicenter registry: 1,034 BAV patients; Age 74.7 years / STS 3.7%

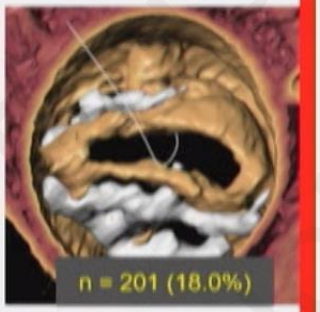
Low TAVI risk
Mild leaflet calcium
(No raphe)/raphe non-calcified

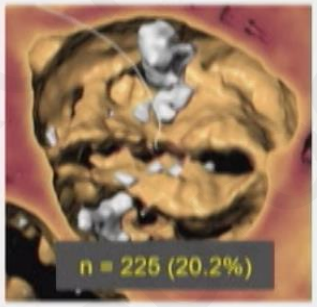




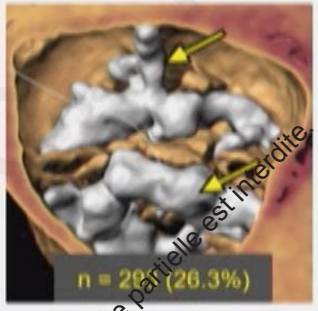
Intermediate TAVI risk
Excess leaflet calcium OR
Severely calcified raphe

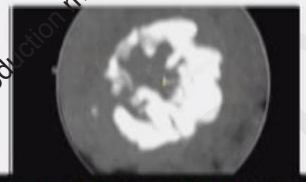






High TAVI risk
Excess leaflet calcium AND
Severely calcified raphe





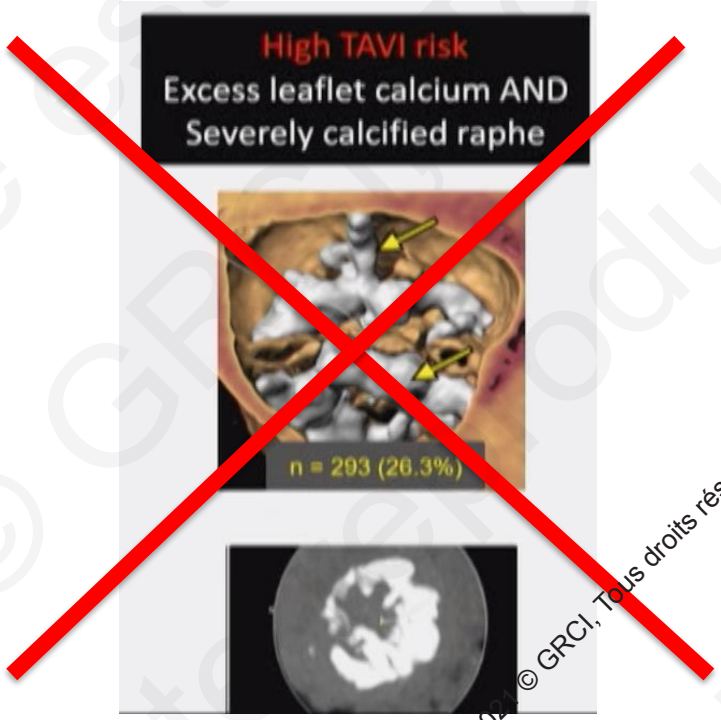
ALSO CIRCUMFERENTIAL CALCIUM

Patterns **of calcification matter more than Sievers phenotype/subtype**

Modified from Yoon and Makkar, EuroPCR 2020 / JACC 2020

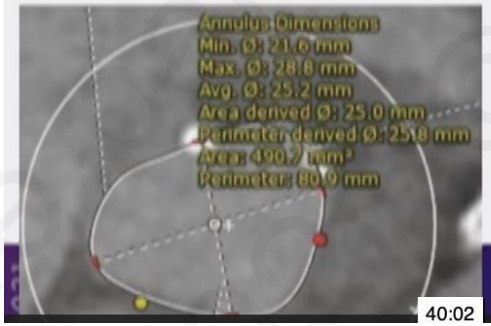
From H Jilaihawi ***PCR London Valves 2021***

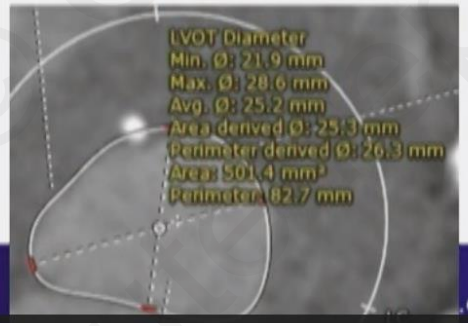
EN PRATIQUE?



ET LE SIZING ?

- Modified annular sizing (high TAVI risk calcium pattern)
  - Supra-annular assessments
    - BAVARD
    - Circles method
    - Casper algorithm
    - Hangzhou solution (balloon sizing)
    - Wu Wai multiplanar assessment
  - Computer assisted predictive models
    - Feops TAVI guide
    - Machine learning/AI?

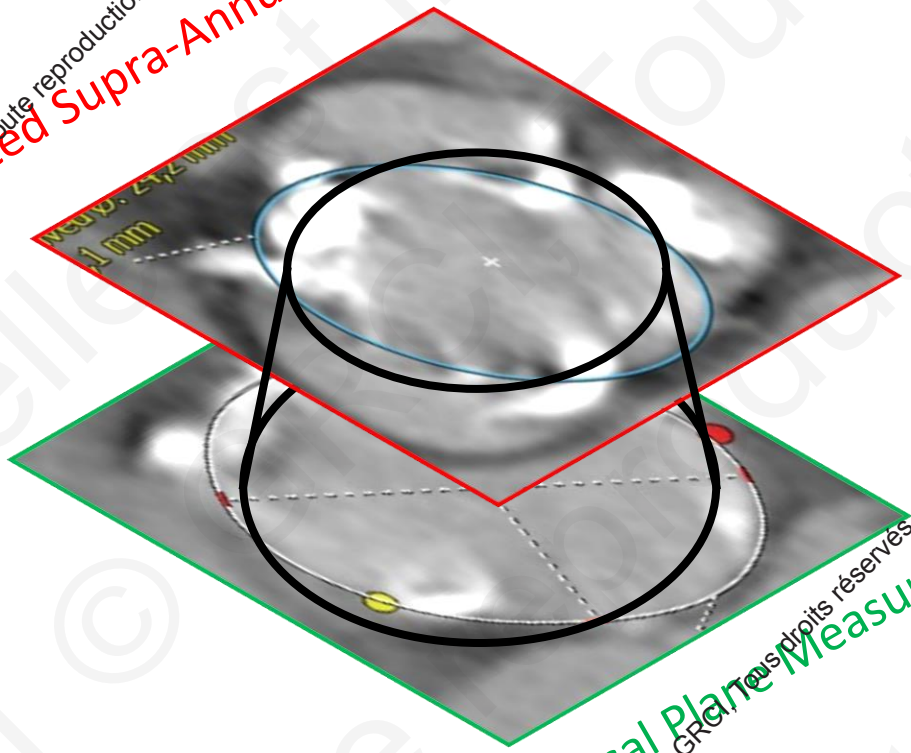




From H Jilaihawi ***PCR London Valves 2021***

Bicuspid TAVR sizing

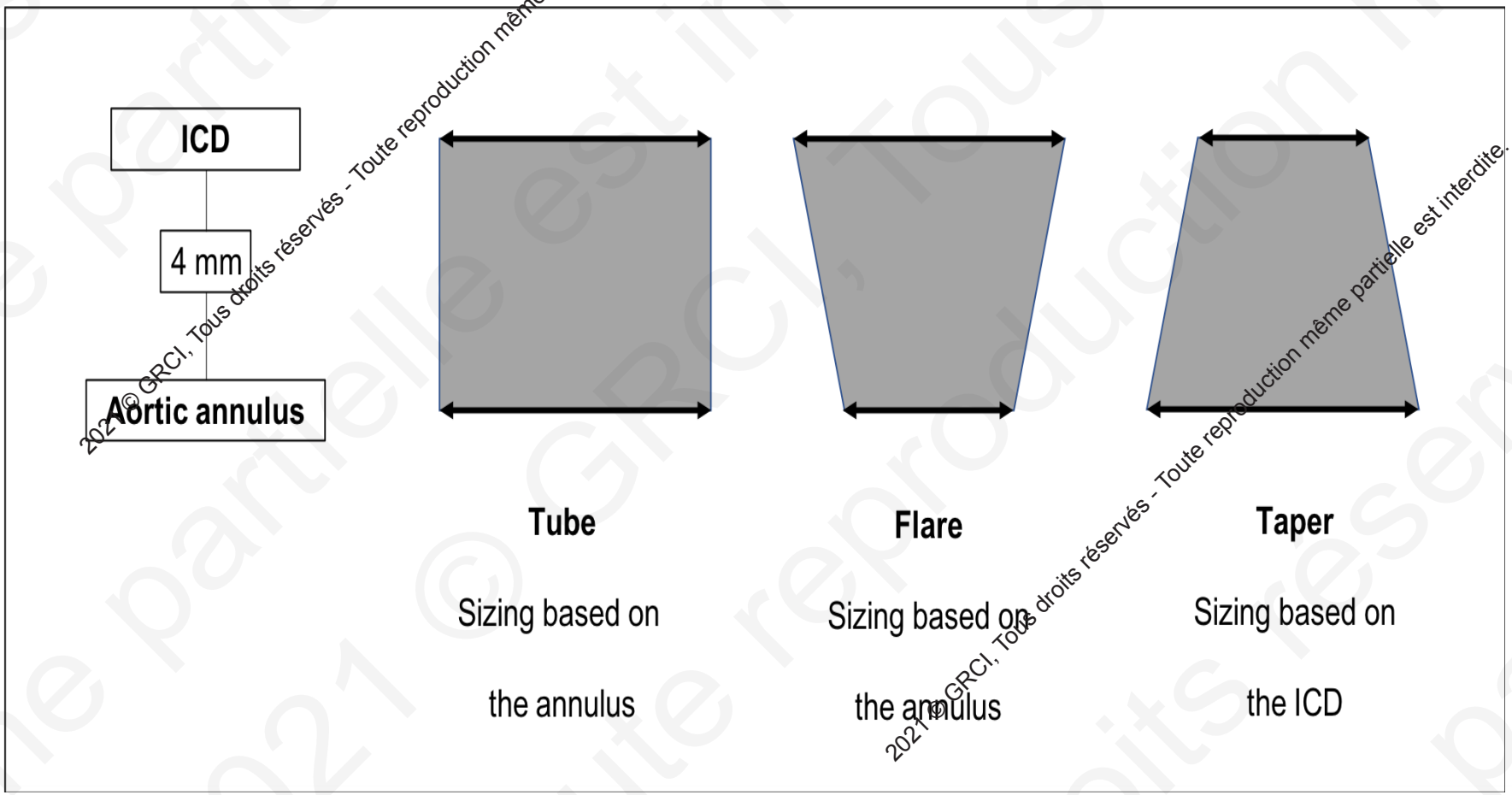
BAVARD landing zone configuration



Tchetche et al., *Circulaton: Cardiovascular Interventions*. 2019;12

Bicuspid TAVR sizing

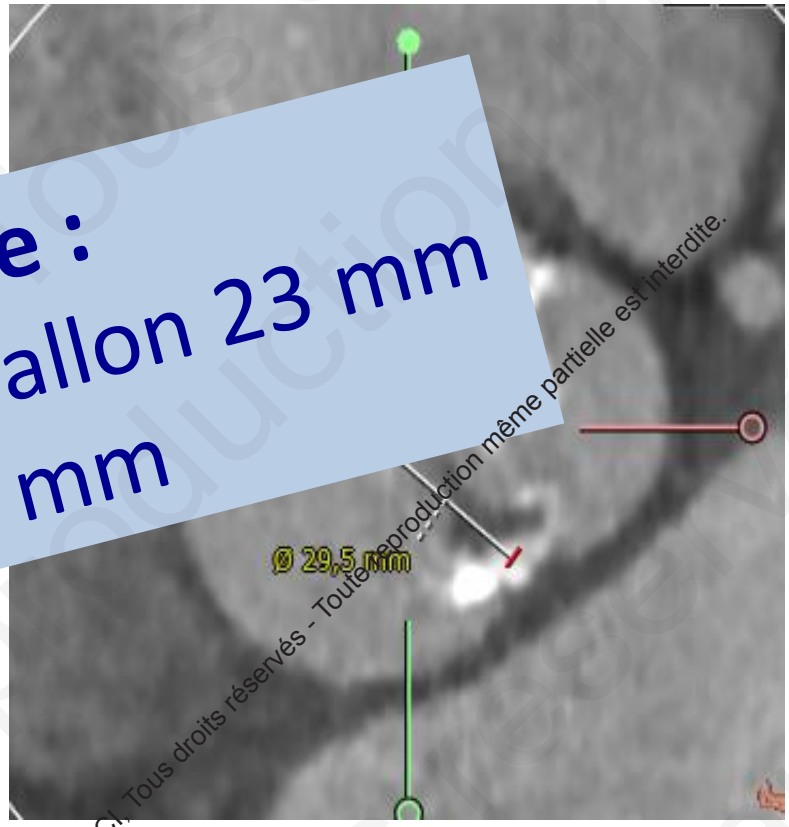
BAVARD landing zone configuration: combined sizing



Tchetche et al., *Circulaton: Cardiovascular Interventions*. 2019;12

Exemple #1

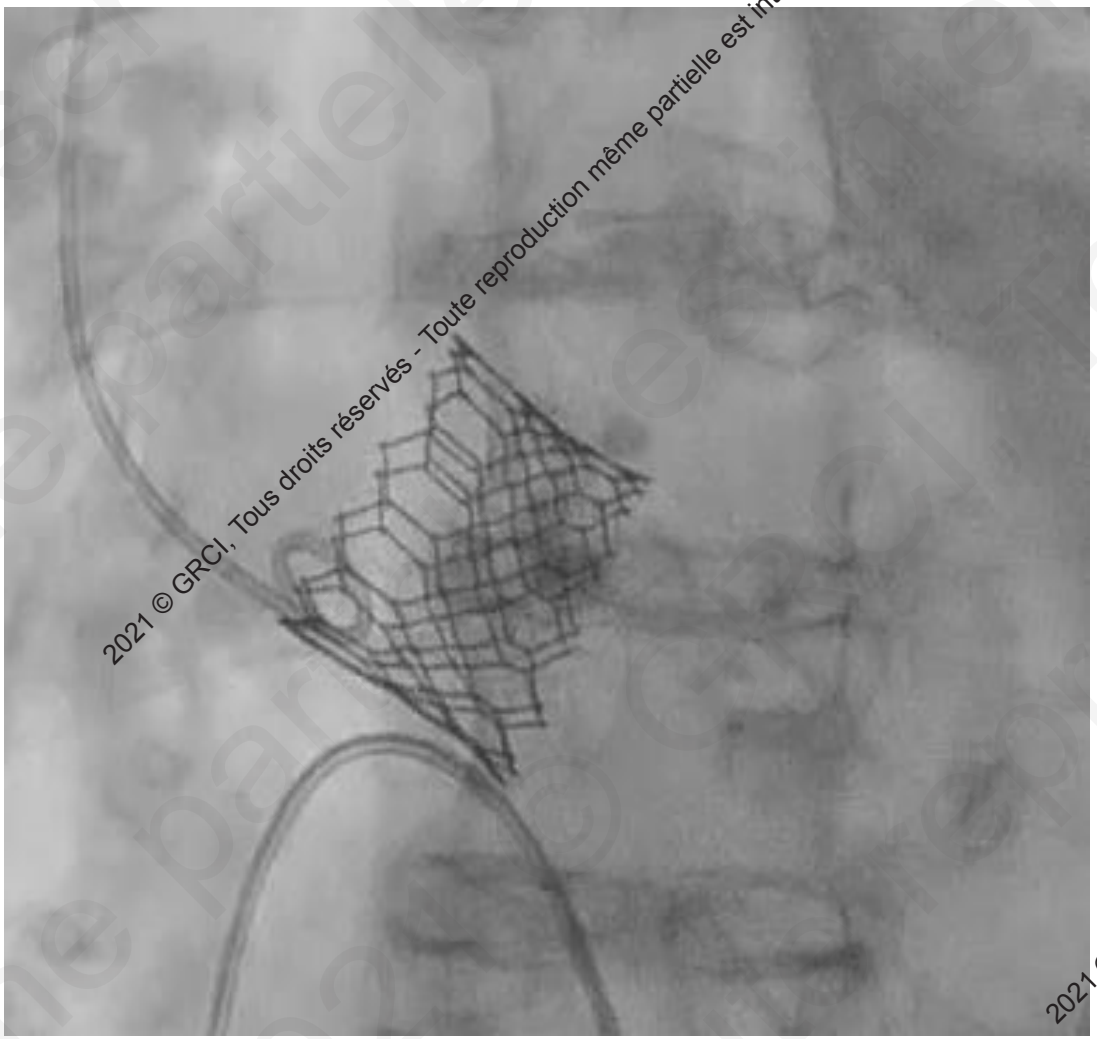
Stratégie :
Predilatation ballon 23 mm
Sapien 3™ 29 mm



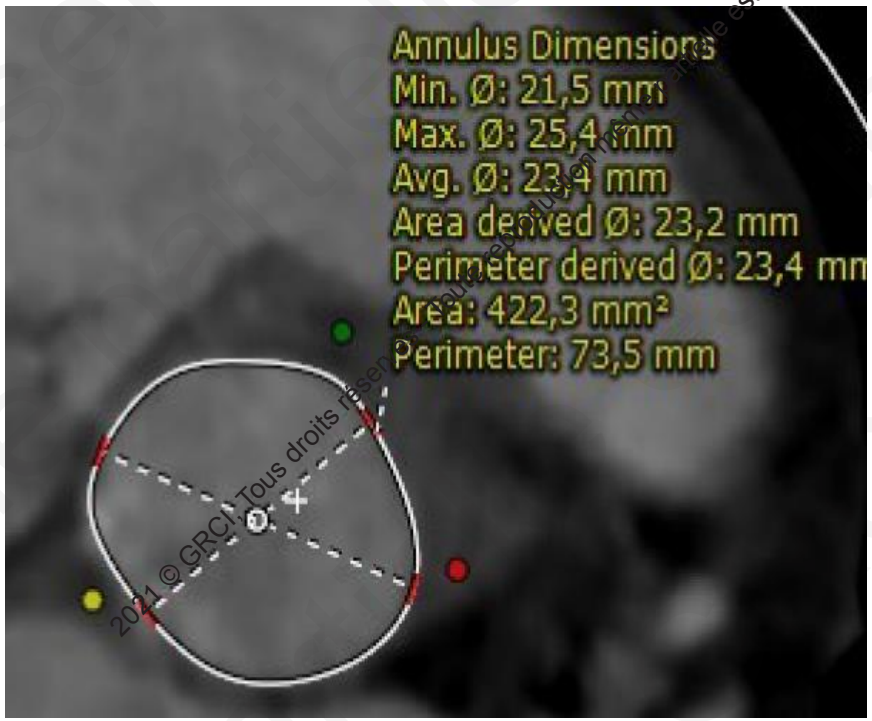
Annulus: 29.8 mm

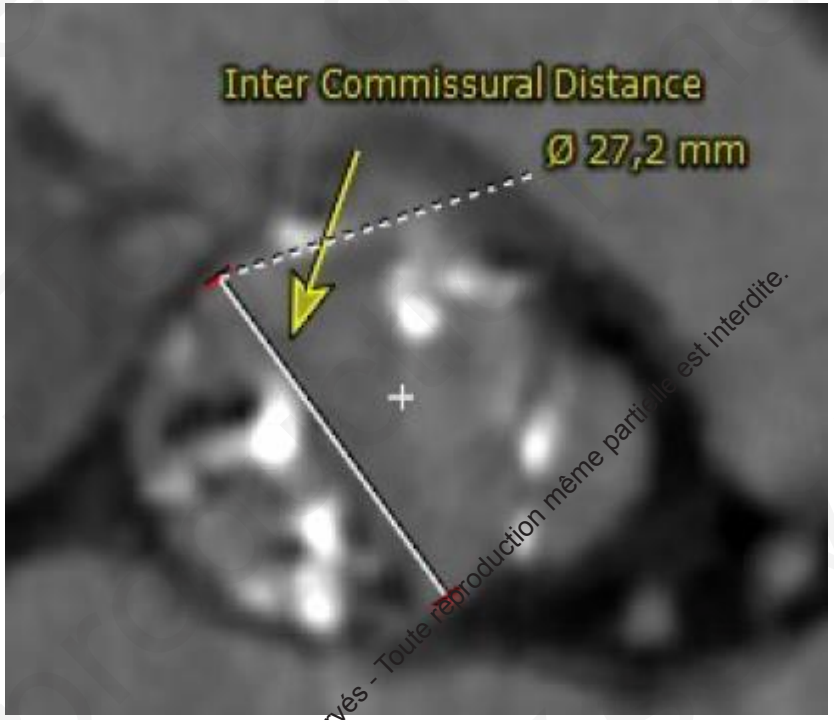
ICD at 4 mm: 29.5 mm

Exemple #1



Exemple #2





Annulus

Perimeter derived ⦸ 23,4 mm

Inter commissural distance

27,2 mm

Exemple #2

Stratégie :

Predilatation ballon 22 mm

Evolut Pro™29 mm

Exemple #2

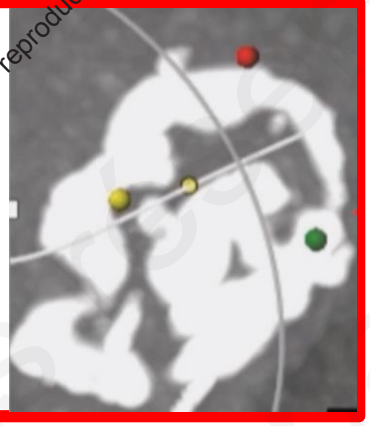
EN CONCLUSION (1)

Peut-on étendre les indications actuelles, élargies, du TAVI aux bicuspidies ?

<u>Doit prendre en compte la notion essentielle de risque anatomique du TAVI</u>

Haut risque anatomique =

calcifications sévères raphe + valve



EN CONCLUSION (2)

< haut risque anatomique : TAVI

Sizing selon technique BAVARD

Pré-dilatation systématique

Oversizing > 20 %

Sizing < 21 mm

Evolut

… autres cas

Edwards, Evolut

Anneau Vertical

Oversizing 0-5 %

Sizing > 29 mm

Edwards

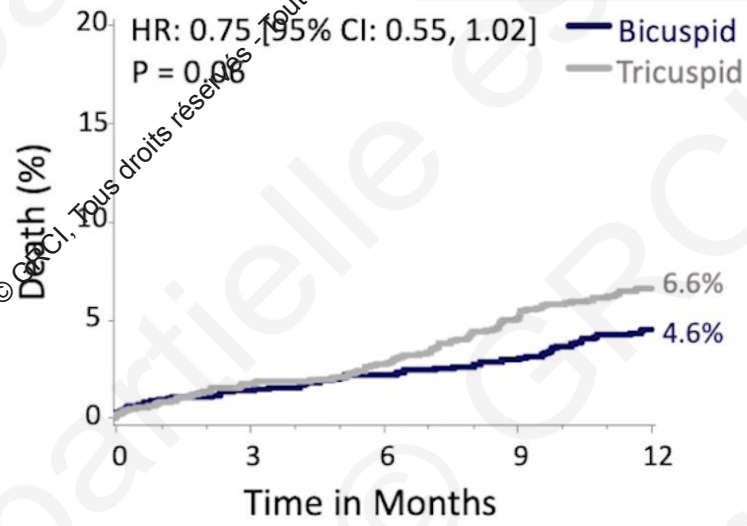
Merci de votre attention

Procedural Complications
Adjusted Cohort

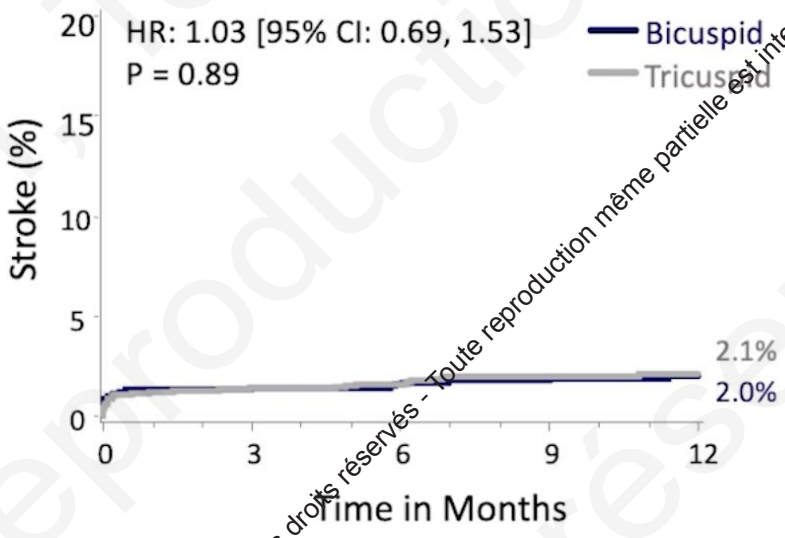
Complication (%)	BICUSPID n = 3168	TRICUSPID n = 3168	p value
Conversion to open heart surgery	0.4	0.4	0.85
Annulus rupture	0.2	0.1	1.00
Cardiopulmonary bypass	0.5	0.4	0.71
Aortic dissection	0.1	0	0.5
Coronary obstruction	0.03	0.1	0.37
Need for second valve	0.3	0.1	0.11

Primary Endpoints – Death and stroke
Adjusted Cohort

30-day outcomes	BICUSPID n = 3168	TRICUSPID n = 3168	p value
All-cause mortality (%)	0.9	0.8	0.55
All stroke (%)	1.4	1.2	0.55
In-hospital mortality			
All-cause mortality (%)	0.6	0.4	NS



Pts at risk	3168	1158	1111	1097	779
Pts at risk	3168	1295	1253	1220	888



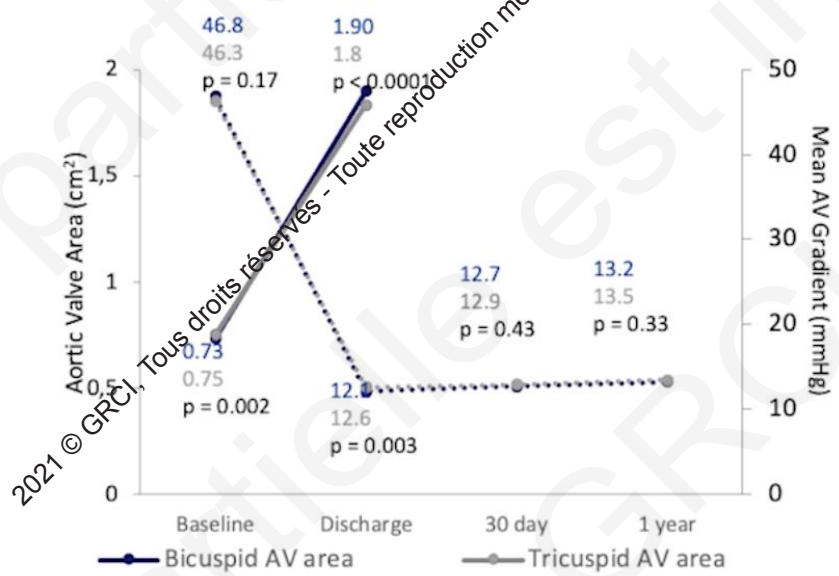
Pts at risk	3168	1145	1097	1082	770
Pts at risk	3168	1274	1232	1196	874

Secondary Endpoints at 30 days and 1 year
Adjusted Cohort

Outcome (KM estimate, %)	30 days			1 year		
	BICUSPID n = 3168	**TRICUSPID n = 3168**	p value	**BICUSPID n = 3168**	**TRICUSPID n = 3168**	p value
New pacemaker	7.91 (230)	6.71 (195)	0.06	8.85 (241)	7.77 (208)	0.08
New requirement for dialysis	0.25 (7)	0.31 (9)	0.64	0.34 (8)	0.70 (14)	0.24
New onset atrial fibrillation	1.39 (43)	0.99 (31)	0.16	1.39 (43)	0.99 (31)	0.16
Aortic valve reintervention	0.36 (11)	0.13 (4)	0.07	1.16 (20)	0.43 (8)	0.02
Any readmission	5.37 (154)	5.43 (158)	0.93	22.36 (361)	23.32 (393)	0.76

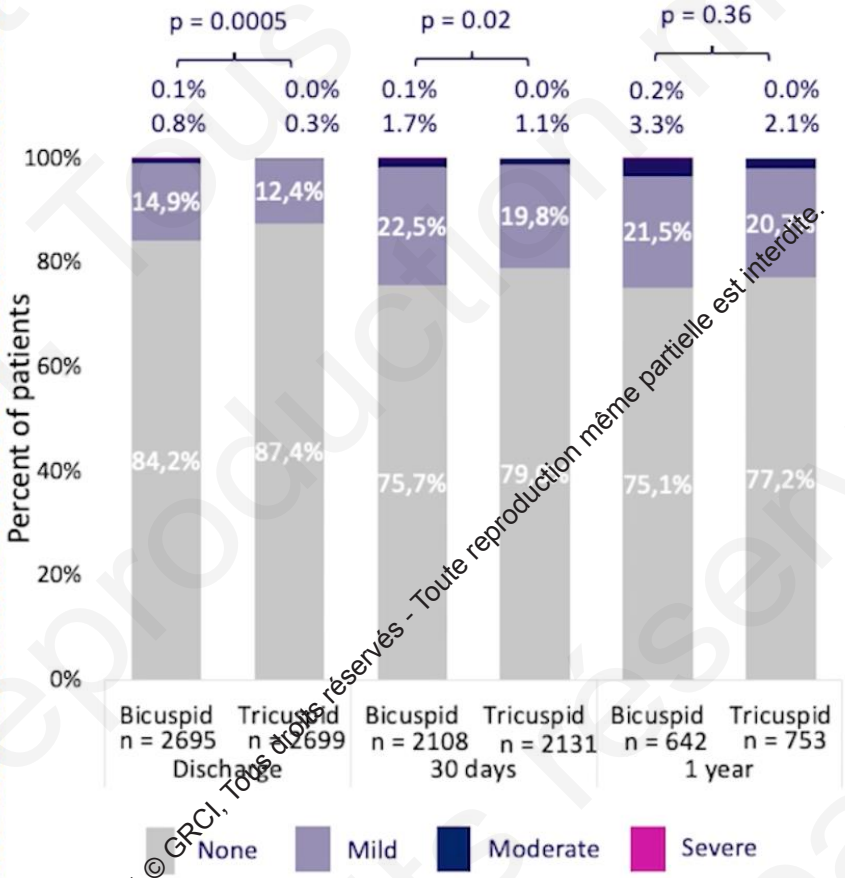
Echocardiographic outcomes

Aortic valve gradients and area

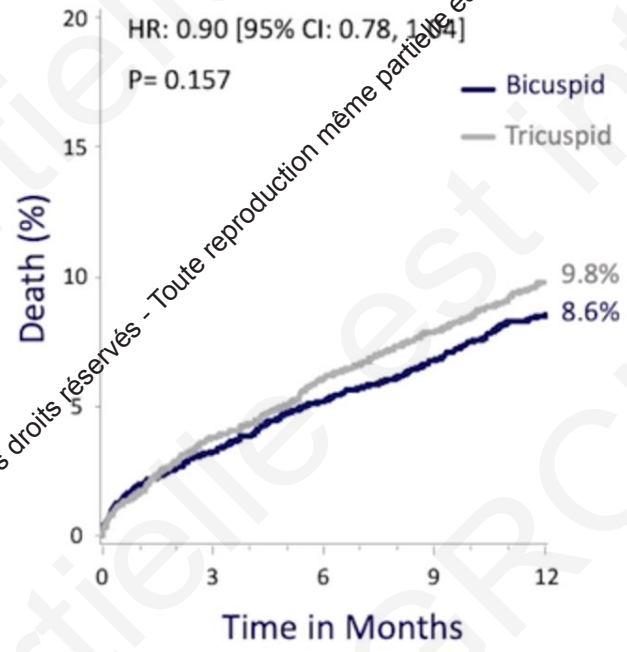


Aortic valve gradients	3135	2903	2318	734
	3133	2889	2338	839
Aortic valve area	3098	2505		
	3088	2473		

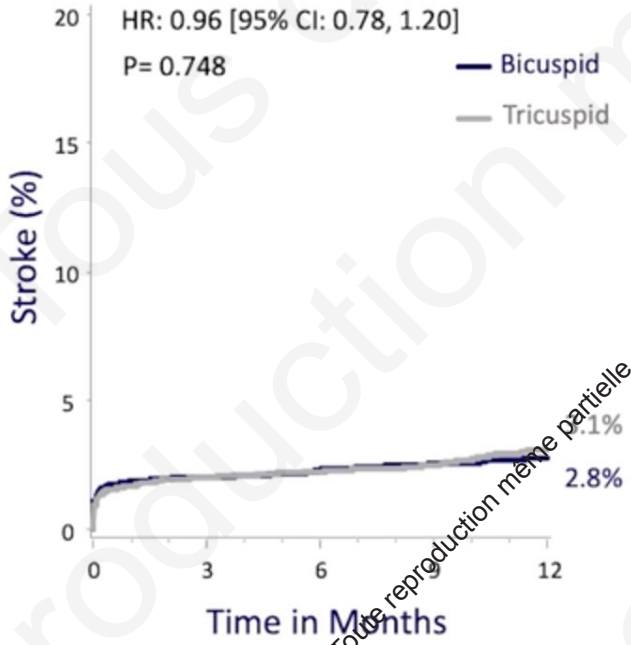
Paravalvular regurgitation



Propensity-Matched Overall Cohort
Death and Stroke at 1 year



Pts at risk	6995	3282	3154	3088	2248
Pts at risk	6995	3567	3437	3349	2453



Pts at risk	6995	3226	3099	3027	2205
Pts at risk	6995	3510	3376	3282	2386