



TAVR with Severe CAD Which First? How?

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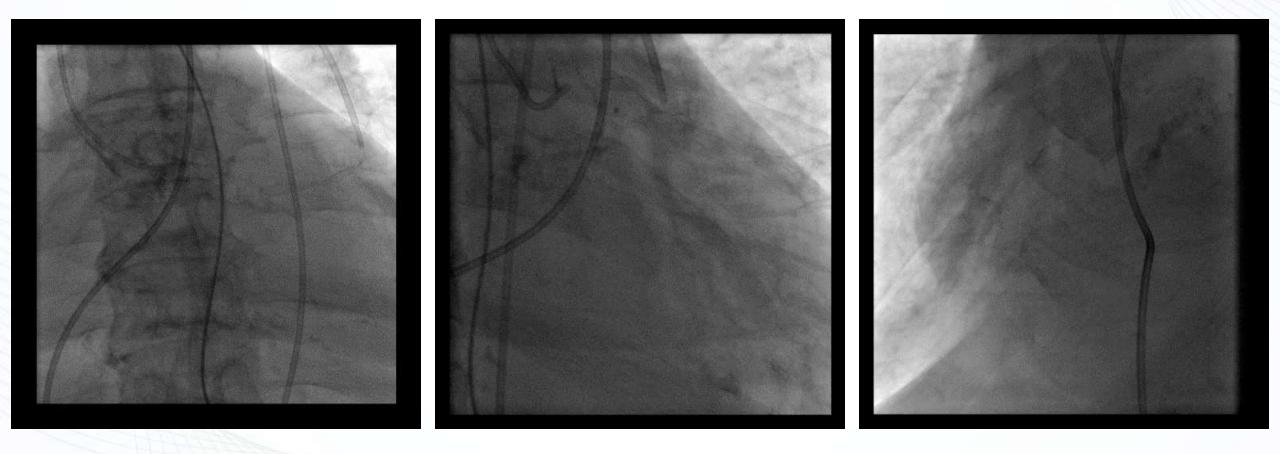


• I have **NO** financial disclosure or conflicts of interest with the presented material in this presentation



Case

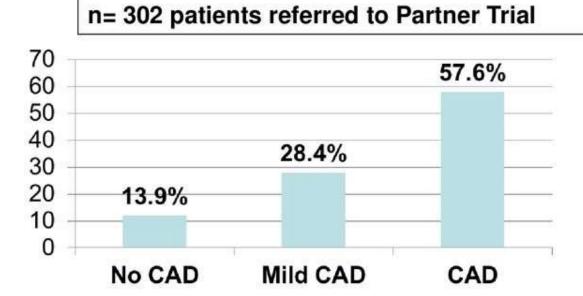
• 81 Y/O male, 159cm, 55.3 kg, Hypertension, Severe AS





CAD in Patients with Severe AS.

WHC: Ben-Dor et al. Circulation 2010;122:S37-42



Patients with CAD had:

- higher STS and Euro scores,
- more females,
- more PVD,

TCTAP

lower EF (all significant).



What is CAD prevalence in AS ?



28th TCTAP

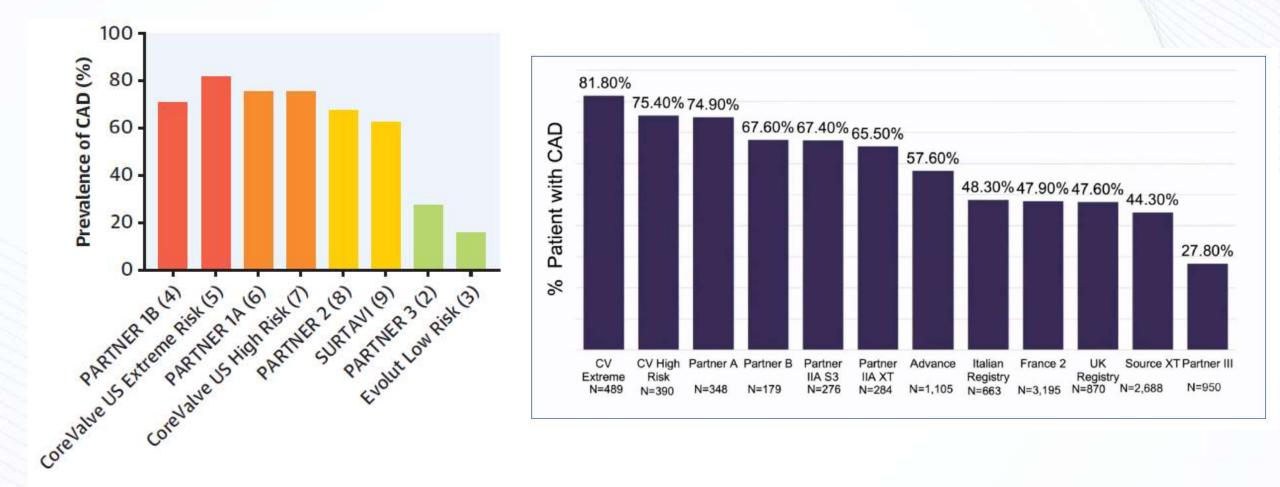
CAD prevalence in severe AS

The prevalence of CAD in the population undergoing transcatheter aortic valve implantation (TAVI) is higher than that in those undergoing surgical aortic valve replacement, and depending on the definition, the presence of significant CAD ranges from 50% to 75%

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(J Am Heart Assoc. 2017;6:e005960. DOI: 10.1161/JAHA.117.005960.)

CAD prevalence in severe AS



TCTAP

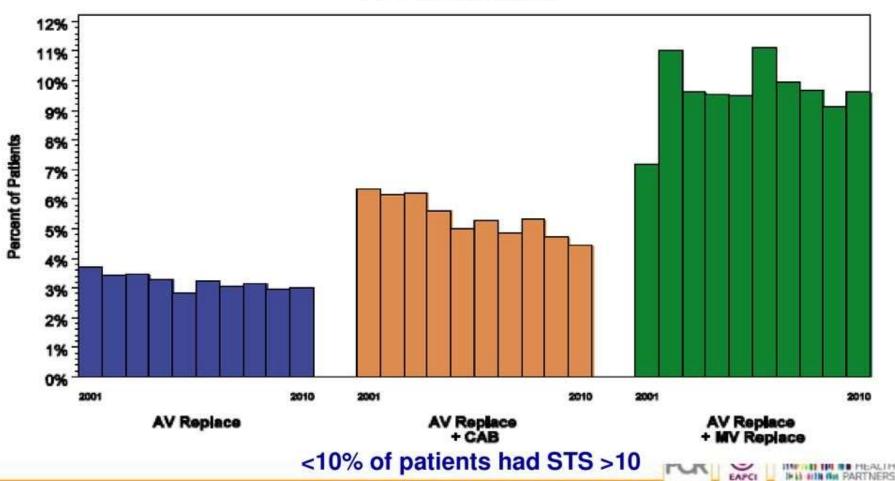
CVRF

Mortality for AVR.

STS Executive Summary 2010

www.sts.org

Unadjusted Aortic Valve Operative Mortality Yearly over last 10 years



TCTAP

Treatment of Severe AS + CAD

- SAVR + CABG
- PCI + SAVR
- PCI + TAVR
 - PCI before TAVR
 - PCI during TAVR
 - PCI after TAVR
 - Age is important
 - TAVI center for PCI



What should we do with severe CAD in TAVR patients ?

- Do nothing, proceed with TAVR
- Revascularize a few weeks before TAVR
- Revascularize during or after TAVR



Transcatheter Aortic Valve Implantation With or Without Percutaneous Coronary Artery Revascularization Strategy: A Systematic Review and Meta-Analysis

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Background—Recent recommendations suggest that in patients with severe aortic stenosis undergoing transcatheter aortic valve implantation and coexistent significant coronary artery disease, the latter should be treated before the index procedure; however, the evide clinical No clinical advantage of patients outco c valve impla Meth erwent outcomes es with trans the ir cipants had a were Increased risk of major vascular highe higher 30-da ascular >5% CI. complication and 30-day mort 0.42aneous coror mortality Conc clinical adva major

Vascular complications and 30-day mortainty. In the absence of demntive evidence, careful evaluation of patients on an individual basis is of paramount importance to identify patients who might benefit from elective revascularization. (*J Am Heart Assoc.* 2017;6:e005960. DOI: 10.1161/JAHA.117.005960.)

Current Guideline recommandation

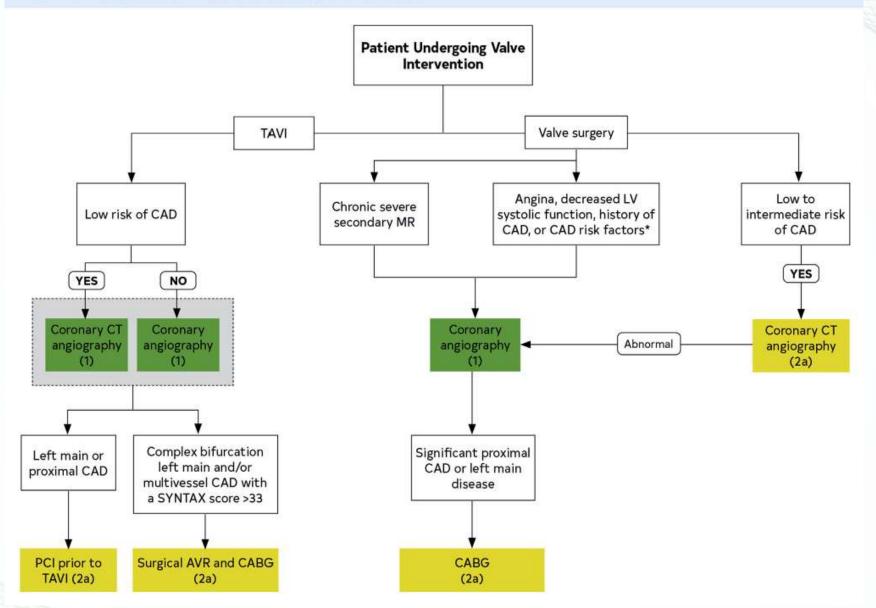




2020 ACC/AHA guideline

Recommendations for Management of CAD in Patients Undergoing TAVI Referenced studies that support the recommendations are summarized in Online Data Supplement 45.

COR	LOE	RECOMMENDATIONS		
1	C-EO	1. In patients undergoing TAVI, 1) contrast-enhanced coronary CT angiography (in patients with a low pretest probability for CAD) or 2) an invasive coronary angiogram is recommended to assess corona		
		anatomy and guide revascularization.		
2a	C-LD	2. In patients undergoing TAVI with significant left main or proximal CAD with or without angina, revas- cularization by PCI before TAVI is reasonable (1,2).		
2a	C-LD	3. In patients with significant AS and significant CAD (luminal reduction >70% diameter, fractional flow reserve <0.8, instantaneous wave-free ratio <0.89) consisting of complex bifurcation left main and/or		
		multivessel CAD with a SYNTAX (Synergy Between Percutaneous Coronary Intervention With Taxus and Cardiac Surgery) score >33, SAVR and CABG are reasonable and preferred over TAVI and PCI (3,4).		



2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease

28th TCTAP

Recommendations for management of CAD in patients with VHD (1)



Recommendations	Class	Level
Diagnosis of CAD		
Coronary angiography is recommended before valve surgery in patients with severe VHD and any of the following: • History of cardiovascular disease. • Suspected myocardial ischaemia. • LV systolic dysfunction. • In men >40 years of age and postmenopausal women. • One or more cardiovascular risk factors.	I	C
Coronary angiography is recommended in the evaluation of severe SMR.	I.	С
Coronary CT angiography should be considered as an alternative to coronary angiography before valve surgery in patients with severe VHD and low probability of CAD.	lla	С

2021 ESC/EACTS Guidelines for the management of valvular heart disease www.escardio.org/guidelines (European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

Recommendations for management of CAD in patients with VHD (2)



Recommendations	Class	Level
Indications for myocardial revascularization		
CABG is recommended in patients with a primary indication for aortic/mitral/tricuspid valve surgery and coronary artery diameter stenosis ≥70%. ^{*,**}	I	C
CABG should be considered in patients with a primary indication for aortic/mitral/tricuspid valve surgery and coronary artery diameter stenosis ≥50–70%.	lla	С

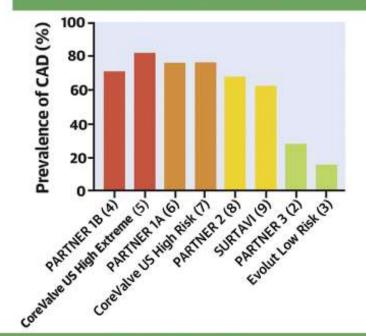
* Stenosis \geq 50% can be considered for left main stenosis.

** FFR ≤0.8 is a useful cut-off indicating the need for an intervention in patients with mitral or tricuspid diseases, but has not been validated in patients with aortic stenosis.

2021 ESC/EACTS Guidelines for the management of valvular heart disease www.escardio.org/guidelines (European Heart Journal; 2021 – doi: 10.1093/eurheartj/ehab395; European Journal of Cardio-Thoracic Surgery; 2021 – doi: 10.1093/ejcts/ezab389)

CAD Management Before TAVR

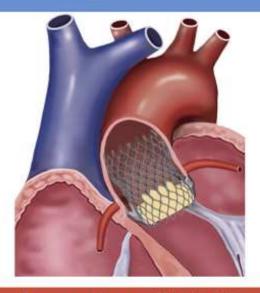
Prevalence of CAD in TAVR Recipients According to Surgical Risk



Future Perspectives

- CTA: Reasonable alternative to coronary angiography for the evaluation of CAD pre-TAVR
- FFR/iFR: Feasible and safe, promising preliminary results

CAD Management After TAVR



Coronary Access After TAVR

- No expected difficulties (in most cases) for coronary access (particularly valves with shorter stent frame/sealing skirt, larger stent cell size)
- Potential increased difficulties for coronary access (particularly RCA) in some cases (taller stent frame/sealing skirt, small sinus of Valsalva, low coronary height)

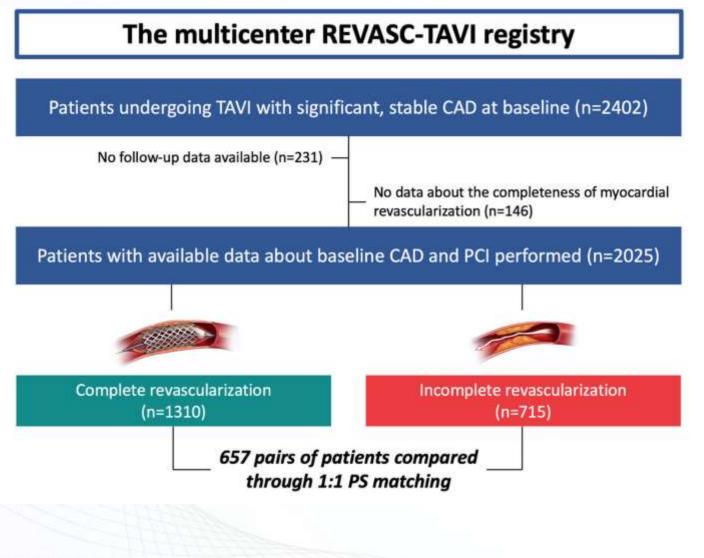
Poor Outcomes Associated With ACS Post-TAVR

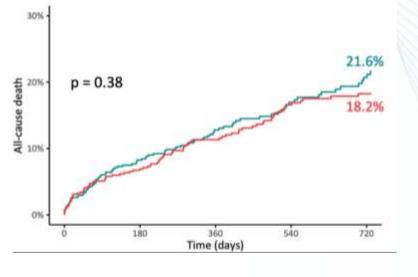
PCI before TAVR ?

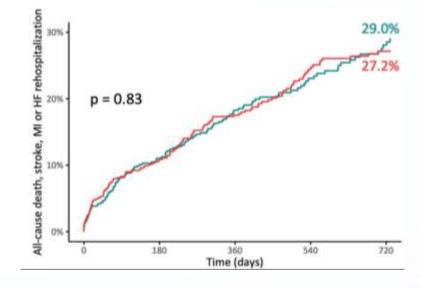




REVASC-TAVI



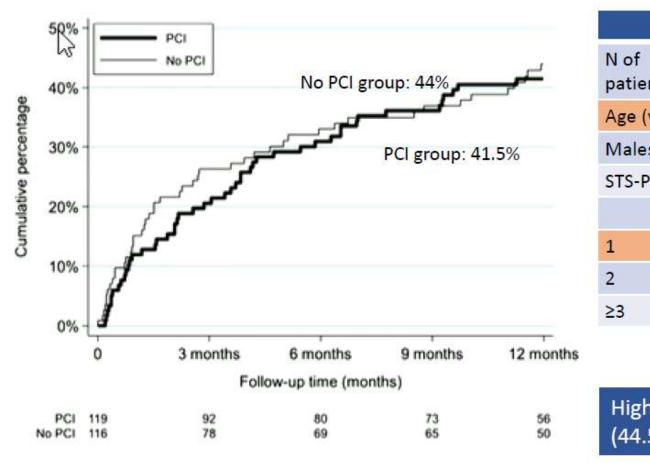




ACTIVATION: PCI versus no PCI in patients with AS & CAD undergoing TAVI



Primary Endpoint: Comparable rates of death & cardiac rehospitalization at 1 year



RCT prematurely stopped due to slow recruitment				
	PCI	No PCI	Total	
N of patients	119	116	235	
Age (years)	83.6±5.0	84.3±5.0	83.9±5.0	
Automatical data and an and a second data	and the second se			

Limitation:

nts		110	200	
years)	83.6±5.0	84.3±5.0	83.9±5.0	
s (%)	58	65	61	
PROM	6.7±6.0	6.8±6.0	6.8±7.7	
	Number of ve	essels treated		
	85 (71.4%)			
	29 (24.4)			
	3 (2.5%)			

Higher bleeding in PCI vs no PCI group (44.5% vs 28.4%, p=0.02)

Patterson T et al, JACC Cardiovasc Interv 2021;14(18):1965-1974

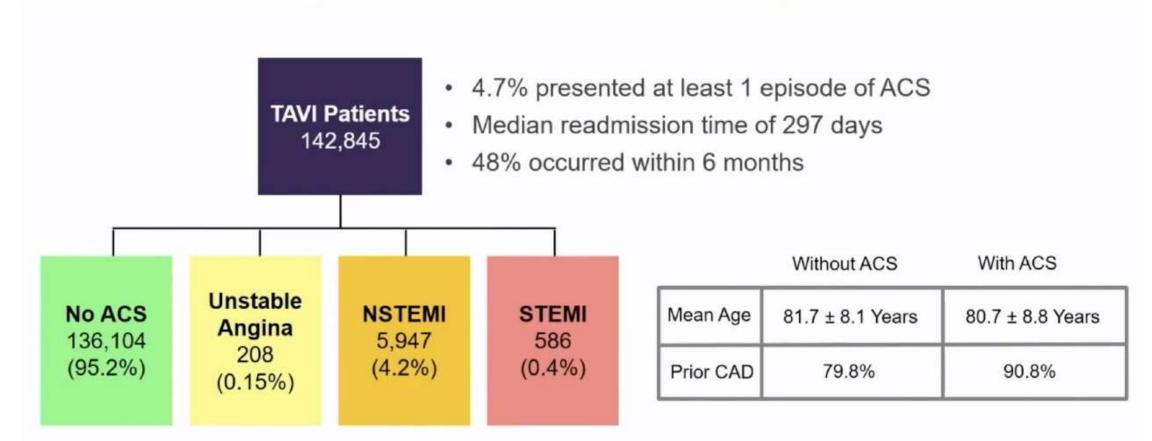
CT-CA (NCT03291925)	Randomized open-label trial (pilot study)	Patients with symptomatic severe AS eligible for TAVR	200	Selective invasive angiography based on CT/coronary CTA imaging vs. systematic invasive angiography	Number of patients enrolled in the study of all those that are eligible
FORTUNA (NCT03665389)	Prospective open-label registry (exploratory)	Patients with moderate stenotic lesions (30%-<70%) or severe stenotic lesions on CTA who are candidates for PCI following TAVR	25	Measurement of iFR before TAVR, FFRct before TAVR and FFR + iFR after TAVR	FFRct before TAVR
TCW (NCT03424941)	Randomized open-label noninferiority trial	Patients age ≥70 yrs with severe AS feasible for treatment by both TF or TSc approach TAVR as well as conventional SAVR, and ≥2 de novo coronary lesions ≥50% diameter stenosis on main artery or side branch >2 mm or single LAD lesion >20 mm length or involving a bifurcation, feasible for treatment with CABG as well as PCI	328	FFR-guided PCI and TAVR vs. CABG and SAVR	Composite of all-cause mortality, myocardial infarction, disabling stroke, unscheduled clinically- driven target vessel revascularization, valve reintervention, and life threatening or disabling bleeding at 1 yr
FAITAVI (NCT03360591)	Randomized open-label trial	Patients with severe AS with the indication of TAVR and at least one coronary stenosis >50% at angiography	320	Physiologically-guided strategy (PCI of lesions with FFR ≤0.80) vs. angiographically guided strategy (PCI of all lesions >50% by visual estimation of major branches >2.5 mm)	Composite of all-cause death, myocardial infarction, stroke, major bleeding and target vessel revascularization at 1 yr
ACTIVATION (ISRCTN75836930)	Randomized trial	Patients with symptomatic severe AS accepted for TAVR, and ≥1 proximal stenosis of ≥70% in a major epicardial artery deemed suitable for PCI	310	Pre-TAVR PCI vs. no pre-TAVR PCI	Mortality and rehospitalization at 1 yr
NOTION-3 (NCTO3058627)	Randomized open-label trial	Patients with severe aortic stenosis selected for TAVR and at least one coronary stenosis with FFR ≤0.80 or diameter stenosis >90% in a coronary artery ≥2.5 mm	452	TAVR only vs. TAVR + FFR-guided complete revascularization	All-cause mortality, myocardial infarction, or urgent revascularization at 1 yr

PCI after TAVR, what do we need ?



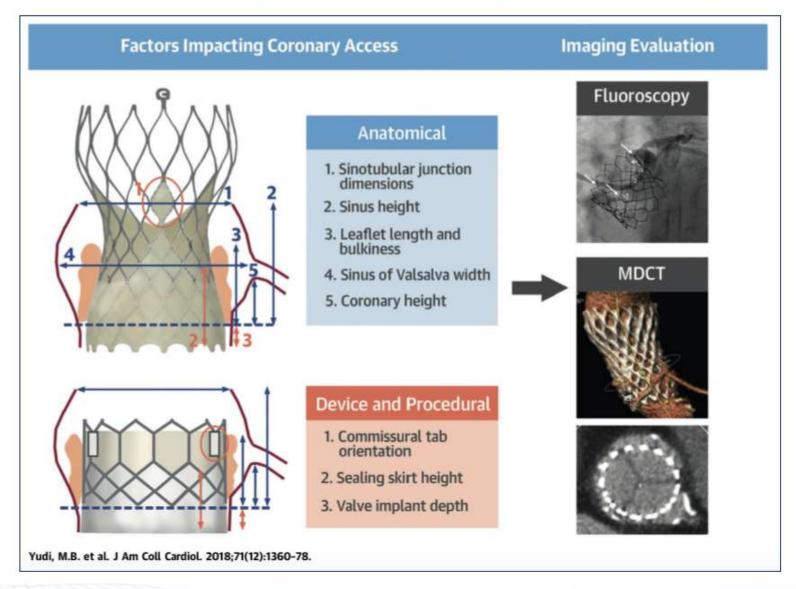


Presentation with ACS post TAVR (Medicare 2012-2017)



Mentias, et al., JACC Cardiovasc Interv. 2020;13:938-950.

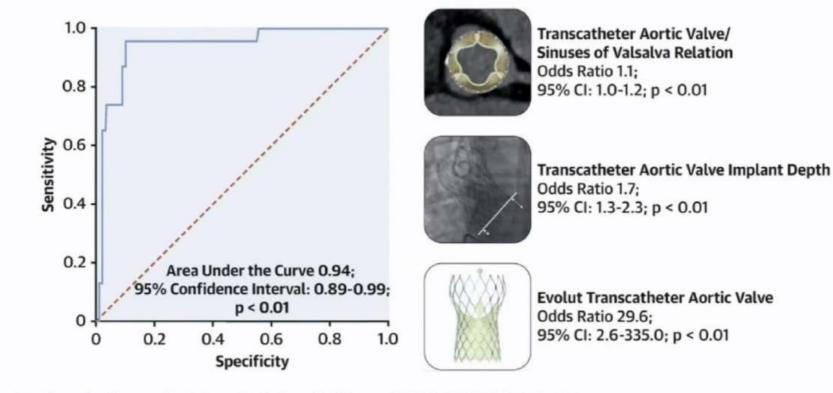
Factors impacting coronary access post TAVI





Coronary access after TAVR

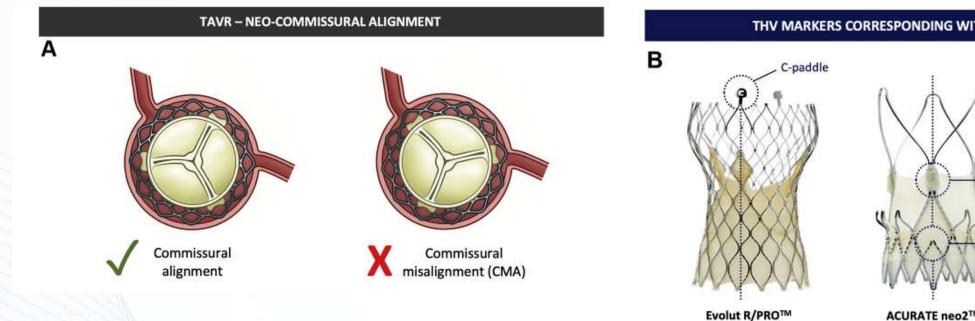
RE-ACCESS: Predictors of unsuccessful coronary access



Barbanti, M. et al. J Am Coll Cardiol Intv. 2020;13(21):2542-55.

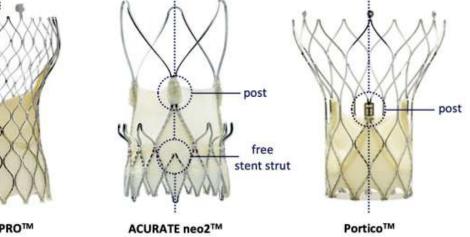


Commissure Alignment

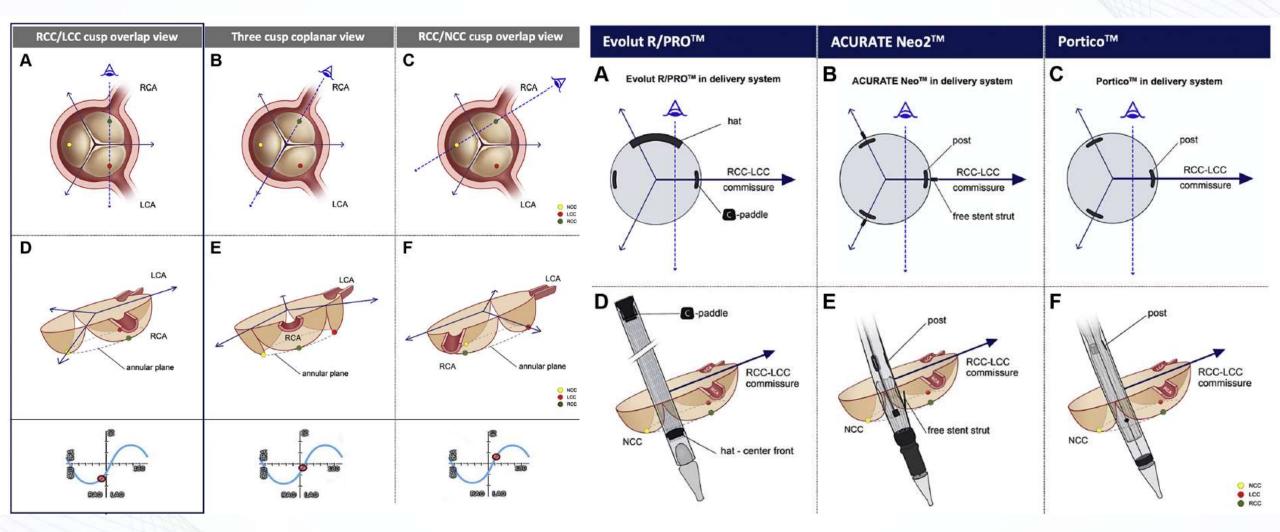


TCTAP

THV MARKERS CORRESPONDING WITH THV COMMISSURE(S)



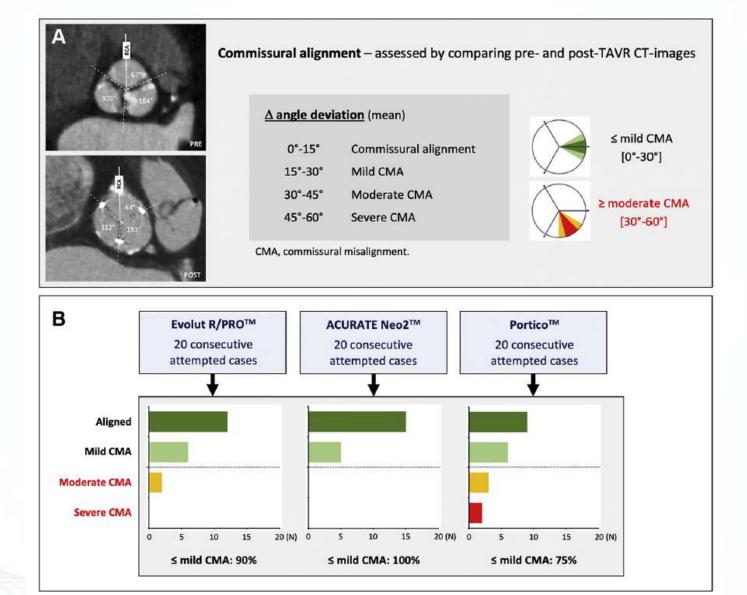
Commissure Alignment





TCTAP

Commissure Alignment



28th TCTAP

J Am Coll Cardiol Intv 2021;14:2097–2108

CVRF

Conclusion

- In patients with AS and CAD, the selection of the optimal treatment strategy is guided by the severity and complexity of CAD.
- Factors determining timing of PCI before/during or after TAVI include coronary accessibility, complexity of CAD.
- From current evidence, PCI before TAVR showed no clinical benefit and increase vascular complications.
- PCI after TAVR can be challenging, depending on coronary ostia height, sinus of Valsalva width, height/width of STJ, stent frame height, degree of oversizing and depth of THV implantation.
- Neo-commissures alignment with native commissures facilitates coronary access and reduces the risk of coronary obstruction with ViV implantation.