Routine Carotid Ultrasound Prior to Transcatheter Aortic Valve Replacement Does Not Predict Peri-Procedural Stroke or Adverse Event

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Background

- TAVR peri-procedural Stroke risk 3-4%
- TAVR> SAVR for pt >80*
- SAVR= TAVR 65-80 y.o. Shared Decision
- TAVR< SAVR pt <65 y.o*
- * also depends on life expectancy

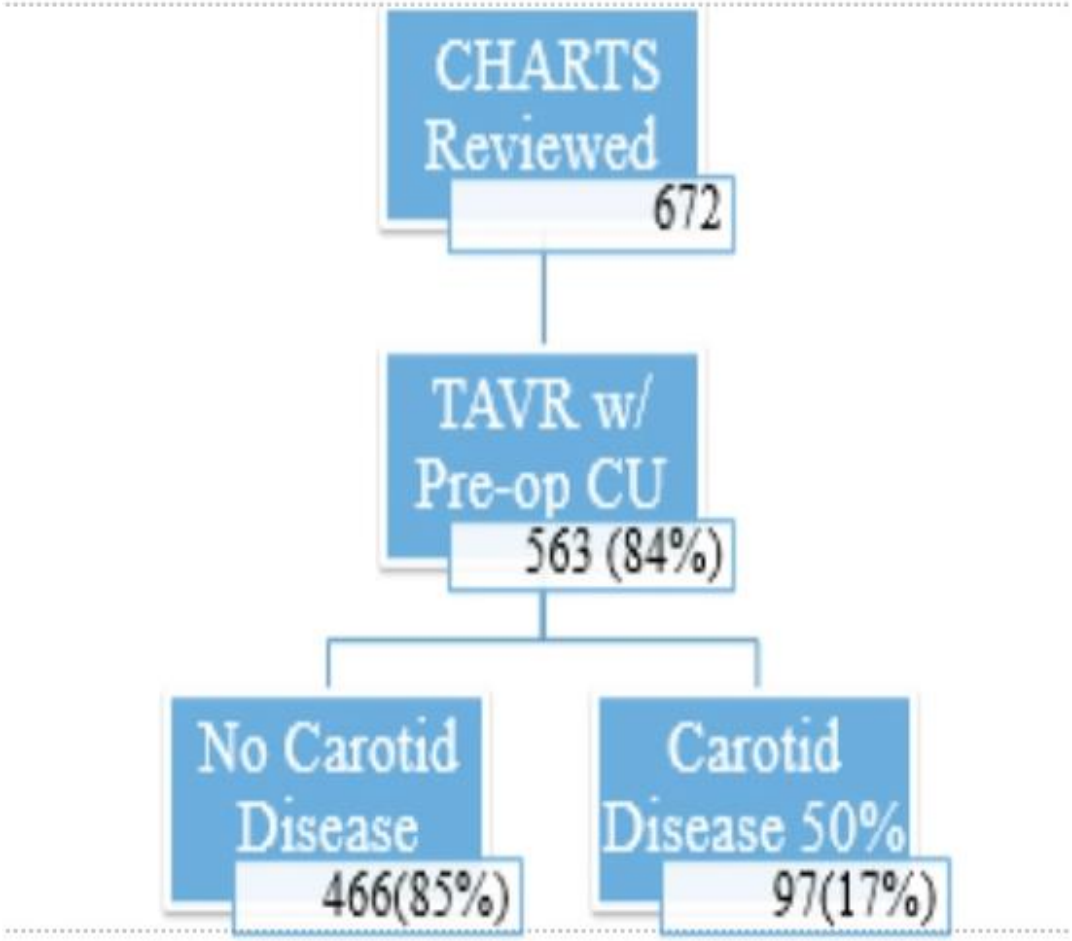
Auffret V, Regueiro A, Del Trigo M, Abdul-Jawad Altisent O, Campelo-Parada F, Chiche O, Puri R, Rodés-Cabau J. Predictors of Early Cerebrovascular Events in Patients With Aortic Stenosis Undergoing Transcatheter Aortic Valve Replacement. J Am Coll Cardiol. 2016 Aug 16;68(7):673-84. doi: 10.1016/j.jacc.2016.05.065. PMID: 27515325.

Objective

- Determine in carotid disease predicts Carotid Vascular Accident
- Determine the yield of pre-TAVR carotid ultrasound
- Determine if any patient characteristics (Gender, CKD, afib, HFrEF, or history of balloon valvuloplasty) were associated with increased risk of stroke

Methods

- Of the 672 consecutive TAVRS performed from July 2015 to September 2020, 563 had Carotid Ultrasound. These cases were retrospectively reviewed, and univariate and multivariate analyses were performed to identify the yield and predictive value of Carotid Ultrasound.



Results

	ALL Patients with Carotid US before TAVR (563)	No Carotid Disease (466)	Carotid Disease >50% Stenosis (97)
age	78.26 +/- 9.07	78.5 +/- 8.94	76.87+/-10
Male gender	65.19%	50%	55.50%
HTN	85.94%	86%	87.60%
Diabetes	40%	40.80%	36.10%
PAD (defined by claudication, intervention, surgery	4%	2.80%	12.40%
prior MI	15.50%	10%	21.60%
CKD 1	0.50%	0.40%	1.00%
CKD2	2.30%	1.90%	4.10%
CKD3	19%	17.80%	22.70%
CKD4	1.24%	1.10%	2.06%
ESRD	2.84%	2.79%	3.10%
Prior TIA/stroke	13.03%	10.60%	24.70%
smoking current on admission	4.80%	4.09%	8.30%
Smoking past	48.80%	46.80%	58.30%
HLD	65%	60%	70.10%
History of Afib	34%	37%	18.60%
known carotid stenosis >50% known before hand	6.70%	1.70%	30.90%
risk category 1-low, 2-intermediat, 3-high prohib	2.46 +/- 0.76	2.42 +/- 0.8	2.61+/- 0.6

	Table 2		
	ALL Patient with Carotid US before TAVR	No Carotid Disease	Carotid Disease >50% Stenosis
Mean Gradient Pre	40.6% +/- 14.9	40.6 +/-15.03	40.46+/-14.66
peakvelpre	3.93+/- 0.96	3.9 +/- 1	4.04 +/-0.72
HFrEF(<40)	19.90%	18%	28.90%
Bicuspid Valve	10.40%	12%	5.20%
prosthetic aka valve in vale	8.90%	10%	3.10%
Sapien	44.40%	46%	37%
Core valve	53.70%	51%	57.70%
Direct Flow	1.40%	1.50%	1.00%
Lotus Valve	1.40%	1%	3.10%
Ballon valvuloplasty at procedure (pre)	9.30%	9.10%	10.30%
Ballon valvuloplasty at procedure (post)	9.80%	10.10%	8.20%
180 Fast, Rapid Pacing	48.30%	50%	40.20%
Mean gradient Post	10.3+/- 77	10 +/- 6.06	11.1+/- 12.8
peakvelpost	2.15+/- 1.3	2.2 +/- 1.4	2.06 +/-0.54
access site femoral	94.80%	96.10%	87.60%
access site carotid	1.80%	1.50%	3%
access site other	3.37%	2.14%	9.30%

Results

Table 3

	ALL Patient with Carotid US before TAVR	No Carotid Disease	Carotid Disease >50% Stenosis
In hospital death	6	5	1
in hospital CVA	19	17	2
in hospital TIA	1	1	0
in hospital outcome	26	23	3
30 day Death	5	4	1
30 day CVA	2 additional	1 additional	1 additional
30 day TIA	1 additional	1 additional	0 additional
total outcomes	34	29	5

Table 5: Multivariate analysis

Source	DF	Type III SS	Mean Square	F Value	Pr > F
gender	1	0.03391871	0.03391871	0.95	0.3309
Any CKD	1	0.18130127	0.18130127	5.06	0.0248
Any afib	1	0.02735851	0.02735851	0.76	0.3825
HFrEF	2	0.07123785	0.03561893	0.99	0.3705
Carotid Stenosis on US	1	0.00009601	0.00009601	0.00	0.9587
Balloon valvuloplasty	1	0.10322557	0.10322557	2.88	0.0901

Conclusion

- Carotid Disease does NOT predict CVA
- The Diagnostic Yield of pre-TAVR Carotid Ultrasound is low.
- One Carotid Ultrasound -> Surgical Intervention
- TABLE 1 demonstrates the similar characteristics of the Two Groups
- Higher rates* of prior MI, smoking, HFrEF in Carotid Disease group
- CKD (26% of all TAVR pt) α CVA