SYNTAX Score Affects Timing and Hemodynamic Support for Percutaneous Coronary Intervention and Transcatheter Aortic Valve Replacement

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Introduction:
- Transcatheter aortic valve replacement (TAVR) has become the preferred treatment for severe aortic stenosis (AS) across the spectrum of surgical risk profiles.

- Data are limited to guide treatment approaches for patients with both obstructive coronary artery disease (CAD) as well as severe AS.

- The SYNTAX score was developed in 2005 to grade CAD complexity, and is validated to predict MACCE in patients undergoing PCI.

- We examined how CAD complexity, assessed by the SYNTAX score, affected timing and hemodynamic support considerations for patients treated with TAVR and percutaneous coronary intervention (PCI) at a Veterans Affairs (VA) facility

Methods:
- 335 TAVR patients were retrospectively reviewed from 2013 to 2020.

- Patients were identified who underwent simultaneous TAVR with PCI or staged PCI within 2 months of TAVR.

- SYNTAX scores were calculated based the most recent pre-TAVR diagnostic coronary angiogram.

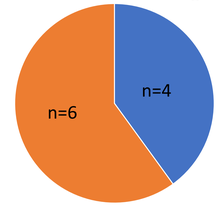
Results:
- 335 patients (mean age 78.0 ± 8.5 years) underwent TAVR.

- 12 patients met inclusion criteria; 2 could not be analyzed (one due to missing data and one due to significant congenitally abnormal coronary anatomy). 10 Patients' pre-TAVR coronary angiograms were scored using the SYNTAX score

- 4 Patients underwent PCI before TAVR and 6 underwent TAVR with PCI. The mean time from PCI to TAVR (if non-simultaneous) was 35 ± 28 days.

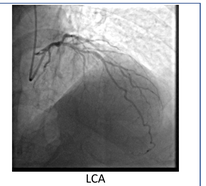
- 5 Patients were cannulated for CPB during PCI +/- TAVR, and tended to have obstructive left main (n=4) and/ or multivessel CAD (n=2)

PCI before vs PCI during TAVR

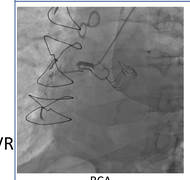


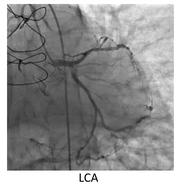
- Underwent PCI prior to TAVR
  Mean SYNRAX score 26 (± 9)
- Underwent Simultaneous PCI with TAVR
  Mean SYNTAX score 48 (± 21)


RCA


LCA

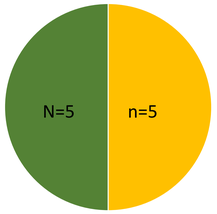
Coronary angiography from a patient who underwent pre-TAVR RCA PCI


RCA

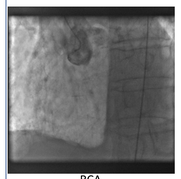

LCA

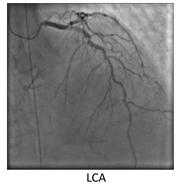
Coronary angiography from a patient with a RCA CTO and occluded SVG to RCA, who underwent protected LMCA-LCx PCI during TAVR

Peri-PCI CPB Cannulation

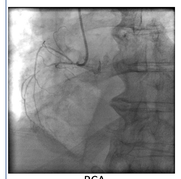


- Not Cannulated for CPB
  Mean SYNTAX score 28 (±13)
- Cannulated for CPB
  Mean SYNTAX score 50 (± 21)


RCA


LCA

Coronary angiography from a patient with an RCA CTO (with L to R collaterals) who underwent LAD PCI without CPB cannulation.


RCA


LCA

Coronary angiography from a patient who was cannulated for CPB during a TAVR + multivessel PCI procedure.

Conclusions:
- Among patients with obstructive CAD and severe AS requiring both TAVR and PCI, those who underwent simultaneous TAVR with PCI had a higher mean SYNTAX score compared to those who underwent staged PCI before TAVR.

- For patients undergoing PCI prior to TAVR, the mean time between PCI and TAVR was 35 ± 28 days.

- Patients cannulated for CPB had a higher mean SYNYAX score than those who were not cannulated.

Future Directions:
- Using the SYNTAX score to evaluate CAD complexity can be helpful when determining PCI timing and hemodynamic support considerations in patients with severe AS and obstructive CAD.

- As patients with increasingly comorbid obstructive CAD and severe AS seek treatment options, additional data may enable a more precise outcomes-driven approach.

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