Aortic regurgitation after TAVI – Can we do better?

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Disclosure of Interest

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- I do not have any potential conflict of interest
Mechanisms of paravalvular leak

A: bulky calcified nodules
B-C: malpositionning
D: undersizing
Impact of PVL

Even mild, aortic regurgitation has an impact on overall mortality after TAVI

Hazard Ratio of Mild AR on Overall mortality

Metanalysis of 45 studies, 12,926 patients

Athappan et al. JACC 2013;61:1585-1595
Malpositioning

Radio-opaque markers
Delivery Catheter System

Acceptable Initial Center Marker Zone (6 mm)
Base of Cusps
Center Marker (3 mm)

Distal flex

1:1 Response
Portico: the first recapturable and repositionable TAV

Landing zone: 3 mm (range 1-9 mm)

Manoharan G, TVT 2015
Missizing

Kasel, JACC imaging 2013
Paravalvular aortic regurgitation

% of Patients with PVL at 30 Days

- SAPIEN XT PARTNER IIB N=236: 37.7% Mild, 24.2% Moderate/Severe
- SAPIEN PARTNER IIB N=225: 44.4% Mild, 16.9% Moderate/Severe
- CoreValve Extreme Risk N=418: 41.5% Mild, 11.4% Moderate/Severe
- CoreValve High Risk N=356: 35.7% Mild, 9.0% Moderate/Severe
- Portico CE Study N=75: 4.0% Mild, 41.3% Moderate/Severe
- SAPIEN 3 PARTNER II S3 N=1504: 28.4% Mild, 3.8% Moderate/Severe
- Direct Flow DISCOVER N=74: 1.4% Mild, 13.6% Moderate/Severe
- LOTUS REPRISE II + Ext N=177: 0.6% Mild, 13.6% Moderate/Severe

References:
- Leon, et al. presented at ACC 2013
- Popma, et al., J Am Coll Cardiol 2014; 63: 1972-81
- Manoharan, et al., et al. presented at TCT 2014
- Kodali, et al., presented at ACC 2015
- Schofer, et al., J Am Coll Cardiol 2014; 63: 763-8
- Meredith, et al., presented at PCR London Valves 2014
Modified TAV design

- External skirt
- Clipping cusps
The bulky calcified nodule
Transcatheter resection devices

Figure 1: Image of the prototype of a device developed by the Brussels group.

Navarra et al. EJCTS 2016
The TAVI parade

Prosthesis with CE – Mark Approval


EDWARDS SAPIEN THV  EDWARDS SAPIEN XT  SYMETIS AURICOMTA  SIM Portico  DIRECT FLOW MEDICAL  BSC Lotus  EDWARDS SAPIEN 3  MEDTRONIC EVOLUT R  BSC Lotus Edge  NVT Allegra  EDWARDS CENTERA

TF, TA  TF, TA  TA  TF  TF  TF, TA  TF, TA  TF, TA  TF  TF  TF, TS

Medtronic CoreValve  JenaValve  Medtronic Engager  Symetis Acurate Neo

TF, TS  TA  TA  TA

Tarantini, EuroPCR 2018
Fusion of echo and CT imaging
Conclusions

- PVL has a negative clinical impact after TAVI
- New generation devices: < 3% mod-severe PVL
- Mild PVL remains a challenge
- Multimodality imaging, new concepts of devices would be helpful in the future