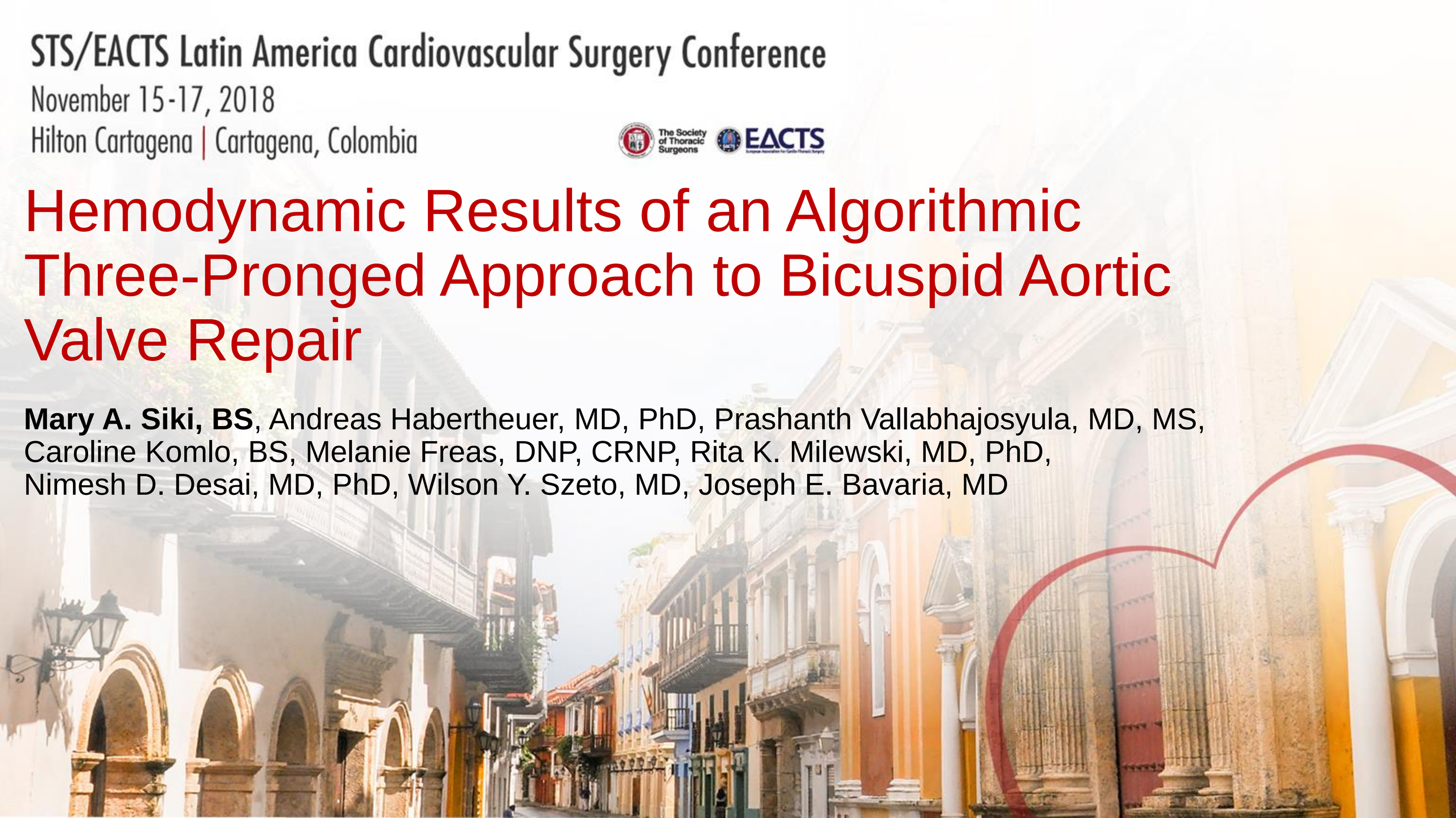
STS/EACTS Latin America Cardiovascular Surgery Conference
November 15-17, 2018
Hilton Cartagena | Cartagena, Colombia

Hemodynamic Results of an Algorithmic Three-Pronged Approach to Bicuspid Aortic Valve Repair

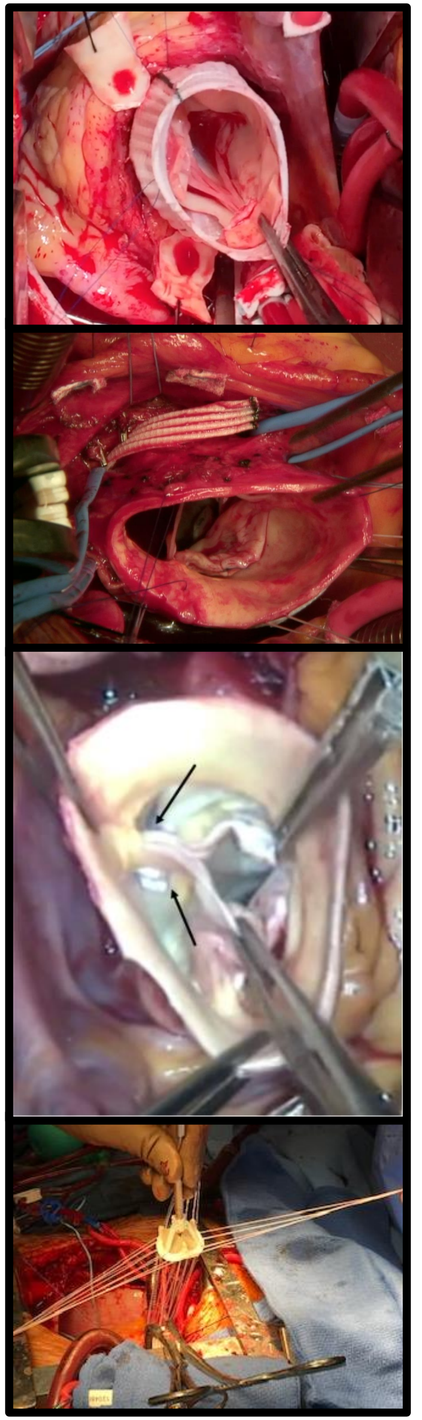
Mary A. Siki, BS, Andreas Habertheuer, MD, PhD, Prashanth Vallabhajosyula, MD, MS, Caroline Komlo, BS, Melanie Freas, DNP, CRNP, Rita K. Milewski, MD, PhD, Nimesh D. Desai, MD, PhD, Wilson Y. Szeto, MD, Joseph E. Bavaria, MD

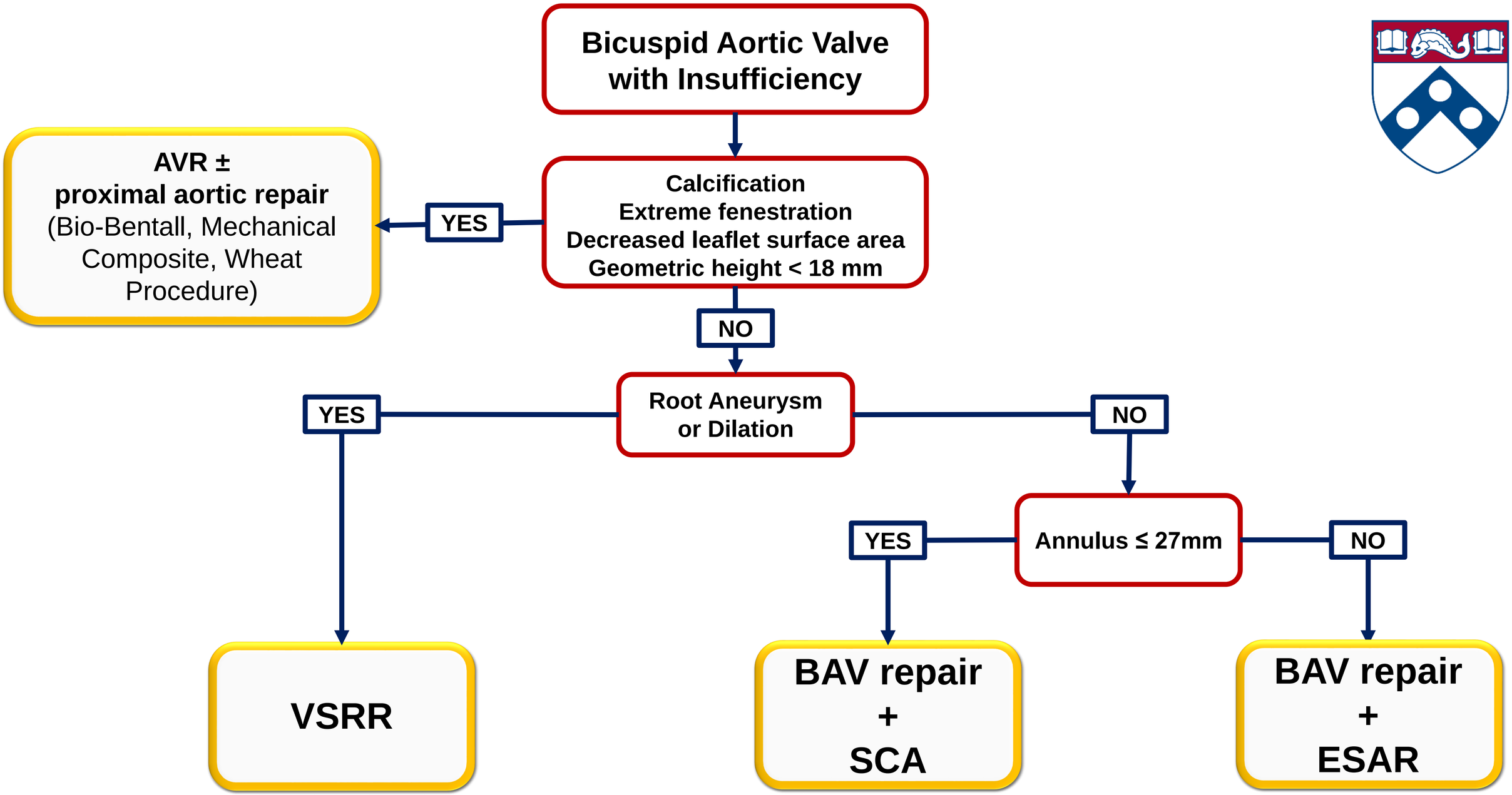


Decision making in BAV repair: the Algorithm

- Nuanced and complex
  - The decision regarding which procedure to perform is influenced by many variables.

- Show the results of our center's decision making approach to BAV repair for aortic insufficiency and why we choose the following options:
  1. Valve Sparing Root Reimplantation (VSRR)
  2. External Subannular Aortic Ring (ESAR)
  3. Subcommissural Annuloplasty (SCA)
  4. Abort to AVR or Bentall procedure




Bicuspid Aortic Valve with Insufficiency
Calcification
Extreme fenestration
Decreased leaflet surface area
Geometric height < 18 mm
YES
AVR ±
proximal aortic repair
(Bio-Bentall, Mechanical Composite, Wheat Procedure)
NO
Root Aneurysm or Dilation
YES
VSRR
NO
Annulus ≤ 27mm
YES
BAV repair + SCA
NO
BAV repair + ESAR

Methods

- A retrospective review was performed of 144 patients with BAV undergoing primary valve repair from January 1, 2003 to March 31, 2018.
  - VSRR (n=71) was performed in patients with aneurysmal aortic roots with or without aortic insufficiency (AI)
  - ESAR (n=22) was performed in patients with AI and aortic annulus >27mm without aortic root dilatation.
  - SCA (n=51) was performed in patients with AI and aortic annulus ≤27mm without aortic root dilatation.
- Primary endpoints of freedom from AI >2+ and freedom from aortic valve reoperation were analyzed using Kaplan-Meier analysis.

Demographics

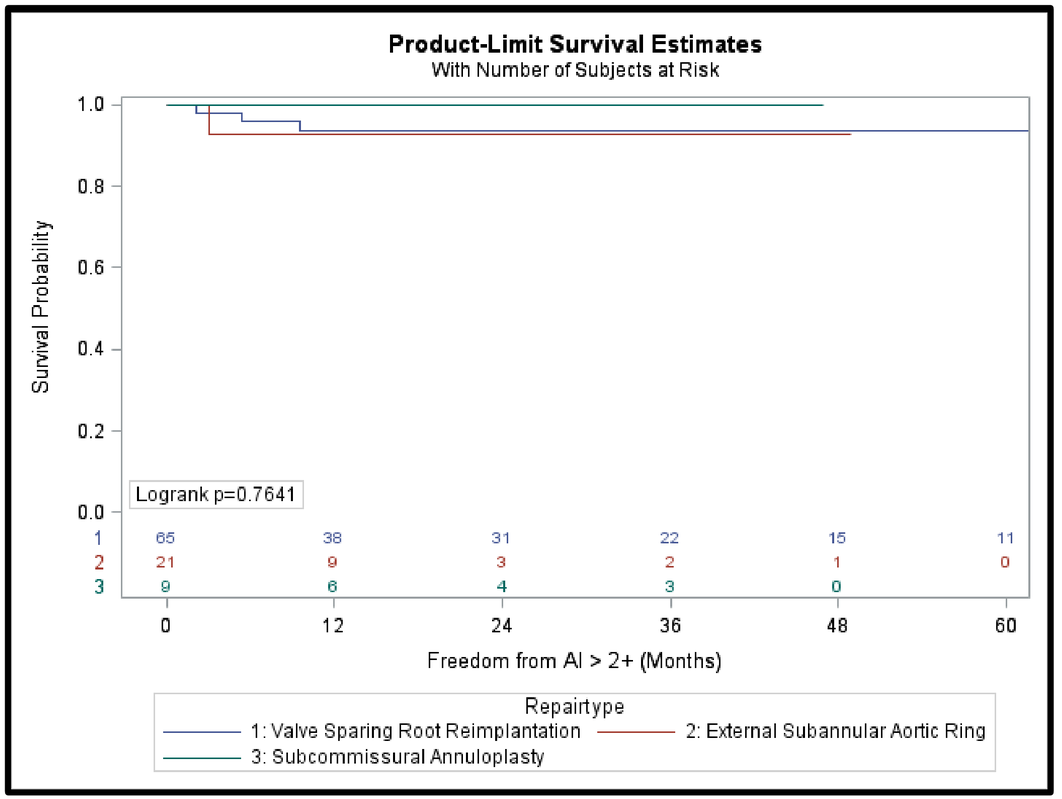
	VSRR (n=71)	ESAR (n=22)	SCA (n=51)	P-value
Age	44.7 ± 12.6	41.3 ± 10.7	43.3 ± 13.5	0.52
Male	61 (85.9)	17 (77.3)	45 (88.2)	0.47
Diabetes	7 (9.9)	0 (0.0)	3 (5.9)	0.30
HTN	**36 (50.7)**	**2 (9.1)**	**27 (52.9)**	**0.003**
CAD	9 (12.7)	1 (4.6)	3 (5.9)	0.52
LVEF < 50%	**12 (16.9)**	**1 (4.6)**	**6 (11.8)**	**0.001**
Preoperative AI > 2+	**26 (36.6)**	**16 (72.7)**	**30 (58.8)**	**0.01**
Pre-op LVEDd (cm)	5.6 ± 1.0	5.5 ± 0.9	5.4 ± 0.8	0.60
Annular Diameter (mm)	**30.2 ± 3.8**	**29.6 ± 3.7**	**28.1 ± 3.0**	**0.03**
SOV diameter (cm)	**4.7 ± 5.3**	**3.6 ± 4.4**	**3.7 ± 4.4**	**<0.0001**
STJ diameter (cm)	**3.9 ± 7.1**	**3.3 ± 6.1**	**3.3 ± 4.9**	**<0.0001**

Perioperative outcomes

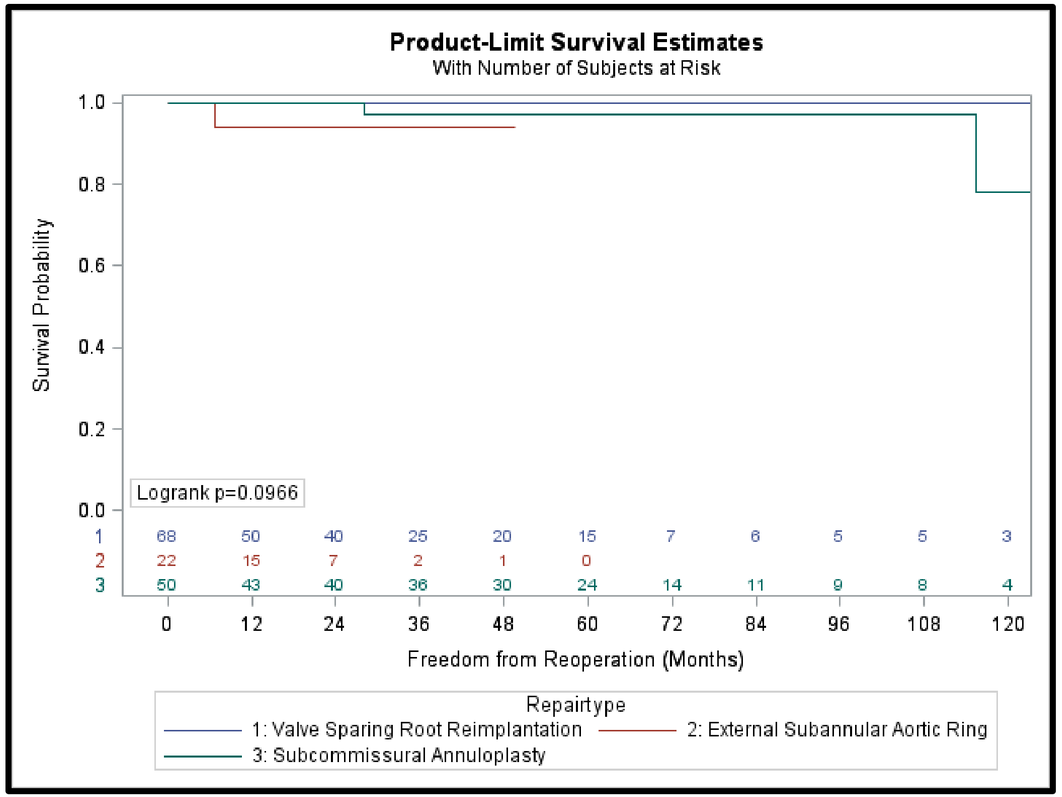
	VSRR (n=71)	ESAR (n=22)	SCA (n=51)	P-value
Cardiopulmonary bypass (min)	**274.6 ± 56.8**	**185.4 ± 46.0**	**143.1 ± 39.6**	**<0.001**
Crossclamp (min)	**223.8 ± 47.5**	**136.7 ± 37.5**	**94.4 ± 30.3**	**<0.001**
30-day mortality	1 (1.4)	0 (0.0)	0 (0.0)	0.75
Stroke	0 (0.0)	0 (0.0)	0 (0.0)	1.00
Annular reduction (%)	**15.4 ± 8.0**	**19.1 ± 7.3**	**12.7 ± 6.6**	**0.01**
Concomitant ascending replacement	N/A	7 (31.8)	24 (46.2)	0.20
Concomitant hemiarch or arch procedure	41 (57.8)	7 (31.8)	23 (44.2)	0.12
MG (mmHg, post-op TTE)	**6.5 ± 3.6**	**10.4 ± 5.1**	**12.7 ± 4.9**	**<0.001**
PG (mmHg, post-op TTE)	**12.1 ± 6.4**	**18.0 ± 8.0**	**23.7 ± 9.2**	**<0.001**

Long-term Outcomes

Freedom from AI > 2+



Freedom from Re-operation



Conclusions

- We have an algorithm and an approach to BAV repair in patients with/without root aneurysm
  - Root diameter > 40-45mm
  - Annular diameter > 27 mm
  - Decision towards AVR/Bentall in calcification and extreme fenestration
- Decision making based on this algorithm results in:
  - 93.7% freedom from AI > 2+ in VSRR group (10 years)
  - 92.9% freedom from AI > 2+ in ESAR group (5 years)
  - 100% freedom from AI > 2+ in SCA group (5 years) after algorithm change in 2013
- Reoperation in all groups is quite low
- Limitations:
  - We changed our algorithm significantly in 2013 based on review of our own SCA data (Vallabhajosyula P et al., *Ann Thorac Surg* 2014)
- We believe this to be a reasonable approach to BAV repair

STS/EACTS Latin America Cardiovascular Surgery Conference

November 15-17, 2018

Hilton Cartagena | Cartagena, Colombia

The Society of Thoracic Surgeons

EACTS

THANK YOU