Structural intervention in 10 years' time

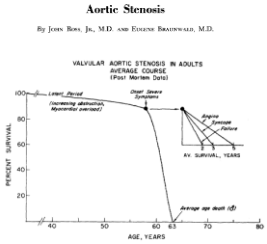
Mark Webster

1

- Aortic valve: TAVI
- Mitral valve
- Tricuspid valve
- Heart failure

2

Outcome of patients with aortic stenosis

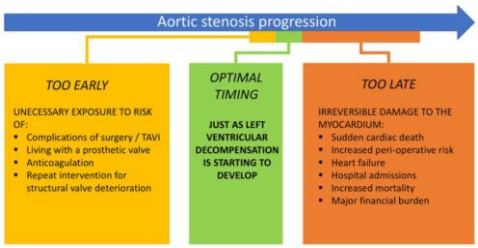


	Patients	Followup, years	Mortality, %
Wood	64	1-7	56
Takeda	60	4-15	82
Ross	12	5+	83

Supplement V to Circulation, Vols. XXXVII and XXXVIII, July 1968

3

When to intervene in aortic stenosis



Everett et al. Heart 2018;104:2067-2076

4

LV dysfunction in aortic stenosis

- LVEF is insensitive
- Stress echocardiography, cardiac MRI and PET/ CT all provide additional prognostic information
- LGE CMR - myocardial fibrosis
  - focal mid-wall fibrosis in 19-62 % of patients with severe AS
  - mainly found in the subendocardial layer of the LV
  - decreases from the base to the apex
- Fibrosis is associated with adverse outcomes, including mortality, after SAVR and TAVI

5

Earlier intervention in aortic stenosis

- Asymptomatic, severe AS
- Moderate AS + LV dysfunction
- Predictors of AS progression/ increased risk
  - Very high aortic valve gradient
  - Heavy calcification of the aortic valve by CT/ echo
  - Inflammation -18F-NaF and 18F-FDG
- EasyAS
  - early intervention with either SAVR or TAVI
- EARLY TAVR
  - 1100 asymptomatic patients with severe AS
  - randomised to TAVR or active surveillance
  - primary endpoint - death, stroke, unplanned CV hospitalization.

6

TAVI - technology improvement

- Valve durability
- Paravalvar regurgitation
- Stroke

- Device profile
- New pacemaker

7

TAVI: Vascular access complications

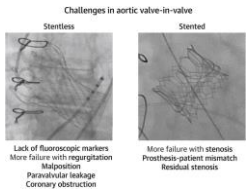
- Improved pre-procedure imaging
  - Contrast CT
  - Angiography +/- IVUS
- Improved access techniques
  - micropuncture kits
  - ultrasound guidance
- Improved access devices
  - better expandable sheaths
  - novel large bore suture and collagen closure devices
- Lower profile TAVI valves and delivery systems
- Additional options for allowing a femoral approach
  - ShockWave

Incorporated into routine practice

8

Valve-in-valve

- TAVI is now an established option for bioprosthetic valve failure
- Technical challenges
  - patient-prosthesis mismatch
  - coronary occlusion
- Better valve and adjunctive technology



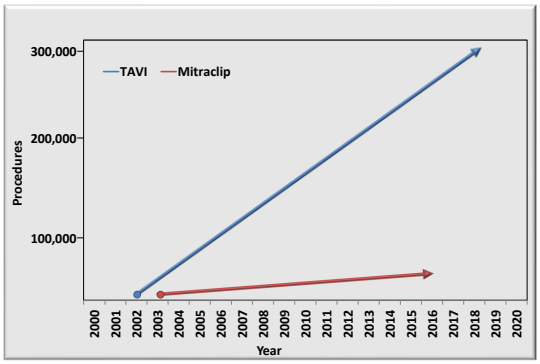
9

Aortic Valve Intervention

- All aortic stenosis anatomically suitable for TAVI
- Aortic regurgitation suitable for TAVI
- Surgery will continue to change
  - bioprosthetic valves
  - aortic root enlargement
  - expandable valve frames

- Intervention much earlier in the course of the disease
  - becoming a low procedure risk
- Better risk stratification, especially early LV dysfunction

10



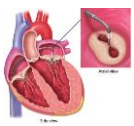
11

Mitral edge-to edge

- COAPT has reinvigorated enthusiasm for treating functional MR
- Alfieri stitch-equivalent
- Learning curve - Coapt

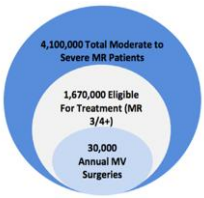
Pascal

MitraClip



12

Mitral Regurgitation



COAPT

- 614 patients,78 US/ Canada centres, 4.5 years
- Fewer than 2 per centre per year

MITRA-FR

- Negative
- Patient population? Operators?

- Better identification of those who will benefit

13

Follow the money

	TAVI	Mitral – repair	Mitral - replacement
Edwards Lifesciences	Sapien	Pascal Cardioband	CardiAQ Sapien M3
Medtronic	Evolut		Intrepid Twelve
Abbott Vascular	Portico	MitraClip	Tendyne Cephea
Boston Scientific	Lotus Acurate	Millipede	MValve

14

Mitral Valve Intervention: Challenges

- Valve
  - D and saddle-shaped
  - Larger than aortic annulus
  - No solid annular ring
  - Sub-valvar component
- Patient
  - Multiple mechanisms of MR
  - Valve versus myocardial disease

There will be no one-size-fits-all

15

Mitral and tricuspid intervention

- Mimics surgical approaches
  - Edge-to-edge leaflet apposition - no
  - Annuloplasty rings - yes
  - Valve replacement - yes
- Optimal repair may need leaflet edge apposition + ring
  - Likely only viable if both products from same company
- Mitral valve replacement
  - Current large trials are with transapical devices
    - Abbott Tendyne, Medtronic Intrepid
  - Needs to be trans-septal
  - Challenges with profile, making bend into LA

16

Mitral Regurgitation: Other Approaches

- Devices to partially block regurgitation

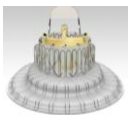
- Chordal technologies

17

Tricuspid valve intervention

- Challenges
  - Very large annulus
  - Valve anchoring
  - Bundle of His, pacemaker leads
  - Valve durability, thrombosis
  - RV overload dysfunction

- Opportunities
  - Many at high surgical risk
  - Easier to access than mitral valve
  - Big clinical problem in NZ



18

Heart Failure Intervention

- Big clinical need/ opportunity
- Still in its infancy
- Fully implantable pumps will get better
  - externally powered
- LA to RA shunt - niche role

- Other new technologies will appear

19

Summary

- Aortic valve
  - TAVI in all anatomically-suitable patients with severe AS
  - Surgery mainly in those requiring other valves, aortic surgery, bypass grafts
  - Earlier intervention - any evidence of LV dysfunction
  - Used regularly for AR
  - Non-thoracotomy alternate access - axillary
- Mitral valve
  - Established procedure for MR (and for mixed lesions, MAC)
  - Volumes will remain well behind TAVI
  - No single dominant approach
  - Imaging will assume even greater importance: pre- and peri-procedure

20

- Tricuspid valve
  - Repair and replacement
  - Modification of mitral valve technologies
  - Established approach for functional TR
- Heart Failure/ LV dysfunction
  - Multiple new device approaches

Many of these devices will be from India and China

"Prediction is very difficult, especially if it's about the future"
Nils Bohr

21

CSANZ
Cardiac Society of Australia and New Zealand

Manaaki Mānawa:
Centre of Research Excellence in Heart Health

- An opportunity to **partner with Māori and Pacific communities** to improve heart health outcomes in Aotearoa
- The Universities of Otago and Auckland will submit a Centre of Research Excellence (CoRE) application for Manaaki Mānawa in December 2019

AIMS:
- To achieve equity in heart health for Māori and Pacific people through the support of research, training & teaching that partners with iwi, hāpu, whānau, aiga and communities

OPPORTUNITIES:
- Grow and support the next generation of Māori & Pacific researchers, scientists, clinicians, and health care practitioners
- Develop and implement a new direction for heart health research and translation into practice

ARE YOU INTERESTED IN: collaborating, critiquing, supporting, advising?
- We welcome any feedback at all and would be pleased to share more details
- Please contact Lisa Wong lisa.wong@auckland.ac.nz (Manaaki Mānawa Research Operations Manager)

22