Essential Support for a Structural Heart Program: The Valve and Structural Heart Clinic

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Team Approach

Can Interventional Cardiology and CT Surgery work together?

“Anything a surgeon can do, I can do better”
Team Approach

Can Cardiologists and CT surgeons work together?

Blalock-Taussig shunt 1945

Dr. Alfred Blalock

Dr. Helen Taussig
Key Factors Influencing Patient Selection and Outcome

- Clinical Suitability
- Technical Suitability
- Structural Patient
- Multidisciplinary Team Decision
- Clinical Outcome
- Physiological Parameters
- Anatomical Parameters
Clinical Assessment

Activities of daily living

Patient and family expectations

Acceptance of risk/outcome

Motivation/mental state/ “will to live”

Life expectancy
Multidisciplinary Team

Interventional Cardiologist
Cardiac Surgeon
Non-invasive cardiology
EP Cardiology
Anesthesiology

Radiology
Intensive Care
Valve Coordinator
Research Coordinators
Dedicated Administrator
Multidisciplinary Team

Pre-procedure patient selection

Intra-procedure management and problem solving

Post procedure management

Post procedure follow up
TAVR Patient Evaluation

1. Confirm the patient is diagnosed with severe symptomatic native aortic stenosis
2. Confirm the patient has been evaluated by two cardiac surgeons and meets the indication for TAVR
3. Evaluate the aortic valvular complex using echocardiography
4. Evaluate the aortic valvular complex and peripheral vasculature using CT
5. Evaluate the aortic valvular complex and peripheral vasculature using catheterization
6. Determine access route for transcatheter aortic valve replacement
Valve Clinic and Coordinator

Clinical care and patient education

Pathophysiology and treatment options

Coordinating diagnostic testing, insurance pre-authorization

Pre and post procedure follow up
Valve Clinic

0930 Registration
1000 CTA
1030 Echo
1115 Labs
1145 PFTs with DLCO
1230-1330 Lunch
1330 Valve Clinic
Frailty/Photo/MMSE
1400 Interventional/CT Surgery
Prevalence of Aortic Stenosis

- Aortic stenosis is estimated to be prevalent in up to 7% of the population over the age of 65\(^1\)

- It is more likely to affect men than women

16.5 Million People in US Over the Age of 65\(^2\)
Major Risk Factors

Independent clinical factors associated with degenerative aortic valve disease include the following:\(^4\)

- Increasing age
- Male gender
- Hypertension
- Smoking
- Elevated lipoprotein A
- Elevated LDL cholesterol
Current Accepted Indication for TAVR

Symptomatic patient with severe AS

Surgically not suitable

High risk for surgery

Anatomically inoperable or very high risk for SAVR

Frail
Frailty: An Important Parameter

Frailty is an important parameter in assessing operative risk

Prevalence of frailty increases with aging; old does not necessarily equal frail

Eyeball test

Various tests may be used as objective measures of frailty, and markers of frailty may include a decline in lean body mass, strength, endurance, weight loss, grip strength, etc.

CSHA Frailty Scale

**Very fit** — robust, active, energetic, well motivated and fit; these people commonly exercise regularly and are in the most fit group for their age

**Well** — without active disease, but less fit than people in category 1

**Well, with treated comorbid disease** — disease symptoms are well controlled compared with those in category 4

**Apparently vulnerable** — although not frankly dependent, these people commonly complain of being “slowed up” or have disease symptoms

**Mildly frail** — with limited dependence on others for instrumental activities of daily living

**Moderately frail** — help is needed with both instrumental and non-instrumental activities of daily living

**Severely frail** — completely dependent on others for the activities of daily living, or terminally ill
Characteristics of a TAVR Patient

TAVR patients may present with some of the following:

- Severe, symptomatic native aortic valve stenosis
- Old age
- Frailty
- History of stroke/CVA
- History of syncope
- Reduced EF
- Heavily calcified aorta
- Prior CABG
- Prior chest radiation
- History of AFib
- History of CAD
- Prior open chest surgery
- History of COPD
- Fatigue, slow gait
- History of renal insufficiency
- Peripheral vascular disease
- Diabetes and hypertension
Euroscore >20
STS>8

Share limitations:
Predictive ability reduced in these high risk patients
Predictive value on morbidity and long term outcome in TAVR era unknown

Risk of Mortality 19.0%
Identifying the Inoperable Patient

While some patients may have low STS scores, certain co-existing conditions may preclude them from being suitable candidates for surgery, for example:

- Extensively calcified (porcelain) aorta
- Chest wall deformity
- Prior chest radiation
- Frailty
- Cirrhosis
- Location of prior bypass grafts

Example: Porcelain aorta in TAVR candidate

The baseline characteristics of the patients in the two groups were generally well balanced (Table 1). The overall patient population was at high risk (STS score, 11.6±6.0%). However, there were many patients with low STS scores but with co-existing conditions that contributed to the surgeons' determination that the patient was not a suitable candidate for surgery, including an extensively calcified (porcelain) aorta (15.1%), chest-wall deformity or deleterious effects of chest-wall irradiation (13.1%), oxygen-dependent respiratory insufficiency (23.5%), and frailty, as determined by the surgeons according to prespecified criteria (23.1%).
Assessing Appropriate Vascular Access

Minimum 6mm diameter
Assess vessel calcification/tortuosity
Some patients may not have adequate vascular access to accommodate the sheath used during transfemoral procedures.

For these patients, the transapical procedure may be an option.
Other Options for Vascular Access

Transapical
Transaortic
Subclavian
Carotid
Transcaval
Devising a Treatment Plan – A Collaborative Process

Patient with severe aortic stenosis identified by referring physician

Patient referred to Structural clinic

Ultimate treatment choice is a collaborative decision between the physicians, patient, and patient’s family

Treatment decision discussed with referring physician

Additional testing completed

Multidisciplinary review & treatment decision by TAVR Heart Team
Conclusions

Patient selection for TAVR/Structural heart requires a team approach

Fundamentally important that the patient be at the very center of all discussion and decision-making regarding his/her circumstance

Both clinical and technical criteria equally important for success

Assessment can be time consuming but is paramount in obtaining good patient outcomes
Thank you