

Quick Review: Asymptomatic Aortic Stenosis

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Abstract

Aortic Stenosis is a disease in "evolution" with our past experience varying dramatically from our present-day reality. This is based on several factors including: a change in etiology; an older patient population; and the use of aggressive non-invasive testing.

IN GENERAL: AORTIC STENOSIS (AS)

Aortic Stenosis is a disease in "evolution".

Our past experience varies dramatically from our present-day reality, which is based on several factors:

a. Etiology of A.S. is changing.

1) 1958 – Am J Card, Paul Woods described 250 patients with A.S., 80% were due to R.F., 20% were Congenital

2) 1987 – Mayo Clinic Proc. reviews 480 cases, 46% degenerative, 33% Congenital, 18% R.F. ("post-inflammatory").

b. Pt. population is getting older, while through aggressive non-invasive testing, A.S. is being "discovered" earlier (i.e. incidentally in asymptomatic patient

1) Used to be recognized at time of symptoms

a) "Early" Symptoms: Angina, Syncope

b) "Late" Symptoms: Dyspnea (LV Failure / CHF)

2) Symptomatic AS – there is UNIFORM AGREEMENT

a) Frank et al – Br Heart J 1973

15 symptomatic patients with "severe" A.S., did not have AVR, followed by NIH, .52% dead at 5 years / 90 % dead at 10 years.

b) Kelly et al – Am J Card 1988

39 symptomatic patients with Mean Gradient of 68, 38% dead at 1 year, 5 of which were 'sudden cardiac deaths'

3) Now, pt's present with symptoms UNRELATED (in varying degrees) to their A.S. (i.e. angina from CAD), and the "screening" Echo documents a gradient across the valve.

a) Relative Importance?

b) How to treat or follow ?

4) Asymptomatic AS – management is CONTROVERSIAL

a) Pellikka et al – J Am Coll Card, 1990:

113 patients with "severe" A.S. (mean age 70), treated medically and followed for a mean of 20 months .33% developed symptoms / 3 cardiac-deaths (but, each death was preceded by 3-4 months of real-symptoms)

b) In fact, Braunwald – J Am Coll Card, 1990 stated:

"operative treatment is the most common cause of sudden cardiac death in asymptomatic patients with Aortic Stenosis" but, if we find ourselves operating on the heart (i.e. CABG) and the patient has underlying Aortic Stenosis (to whatever degree), what should be done ?

NATURAL HISTORY OF ASYMPTOMATIC AS

Before we operate on any disease process, we must understand the natural course of events in order to rationally compare treatment options.

a) Rosenhek, NEJM 2000: Predictors of Outcome in Severe Asymptomatic

Aortic Stenosis

128 patients identified in 1994, all asymptomatic with a "stenotic valve" and an AjV of at least 4m/sec

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- 59 females / 69 males,
- Mean Age, 60
- Mean AjV, 5.0 m/sec

Follow-up on 126 patients

- 22 patients (w/o symptoms) had AVR, because of Cardiology Referral
- 106 “study patients” non-surgical.

1) Event-free Survival

1 yr. : 67%
2 yrs. : 56%
3 yrs. : 33%

- 8 pts died (6 directly from their cardiac disease)
- 59 pts developed symptoms & required AVR !

2) Multivariate Analysis

- The only independent predictor of outcome was the extent of aortic valve calcification.
- Age, Sex, HTN, DM, Hypercholesterolemia, and presence/or absence of CAD were NOT significant (in predicting outcome).

3) Aortic Valve Calcification (event-free survival)

Classification system:

“Mild” A.S. - Degrees 1 or 2 calcification
“Severe” A.S. - Degrees 3 or 4 calcification

Degrees of Calcification:

1 - no calcifications seen
2 - mildly calcified with small, isolated lesions
3 - moderately calcified with multiple, large lesions
4 - heavily calcified with extensive thickening & involvement of all valve cusps

4) The Rate of Stenotic Progression [AjV]

- An important PROGNOSTIC FACTOR.

of those patients in the moderate-severe calcification group, those that increased their AjV by 0.3 m/sec (or more) within

a one-year time interval, had a 79% chance of requiring AVR or dying in the next 2 years

Conclusions of NEJM 2000

- in patients with hemodynamically-significant AS, it is relatively safe to delay surgery until symptoms develop.

However:

1. sudden death may occur [chance < 1%].
2. death may occur very quickly after the onset of symptoms.
3. risk of surgery is HIGHER in symptomatic patients than in ASYMPTOMATIC patients.

a) Low-risk Sub-Group: Pts with degree 1 or 2 calcified valves These pts will remain asymptomatic for “many years” and elective surgery is “definitely not justified”. Annual follow-up with Echo & they should report ANY onset of symptoms (for prompt AVR).

b) High-risk Sub-Group: two divisions Both divisions must be closely followed with serial echos & should report ANY onset of symptoms for urgent-AVR

1.) Degree 3 or 4 Valves, with stable AjV

- moderate-to-severe calcification
- rapid disease progression can be expected
- 80 % of patients will require AVR or die within 4 years but elective (“prophylactic”) replacement can not be recommended.

2.) Degree 3 or 4 Valves with AjV > 0.3 m/sec within 1-yr period have an 80 % event rate at 2 yrs (AVR or death) “these pts may benefit from “prophylactic” AVR prior to symptoms”.but again, not true data to support !

IN SUMMARY

Should ASYMPTOMATIC AS be operated upon ?

For AVR:

1) Risk of Sudden Death without AVR

a) may occur in the absence of preceding symptoms

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- b) reported to be up to 3 – 5 %, Ross – Circ 1968
- c) likely risk is actually less than 1 %, NEJM 2000
- 2) Risk of ongoing irreversible myocardial damage
- a) purely theoretical has never been shown
- b) spectrum of disease progression
- 1) LV Hyperplasia
- 2) LV Hypertrophy
- 3) Dilated Cardiomyopathy
- 4) CHF
- 3) Otto '97: "A.S. rapidly progresses in asymptomatic patients which >produces poor overall outcomes"

Against AVR:

- 1) The risk of Surgery, itself: Operative Mortality 1 – 3 %
- 2) The risk of the Prosthetic Valve
- a.) Mechanical: Anticoagulation (5 % morbidity, annually)
- b.) Tissue: Valve Failure over time

so, the basic question remains unanswered & thus, controversial

THE PROBLEM:

there has never been a randomized, prospective study evaluating treatment options in Asymptomatic Aortic Stenosis without this, can we ever rationally agree ?

References

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