Evaluation and Treatment of the Asymptomatic AS patient

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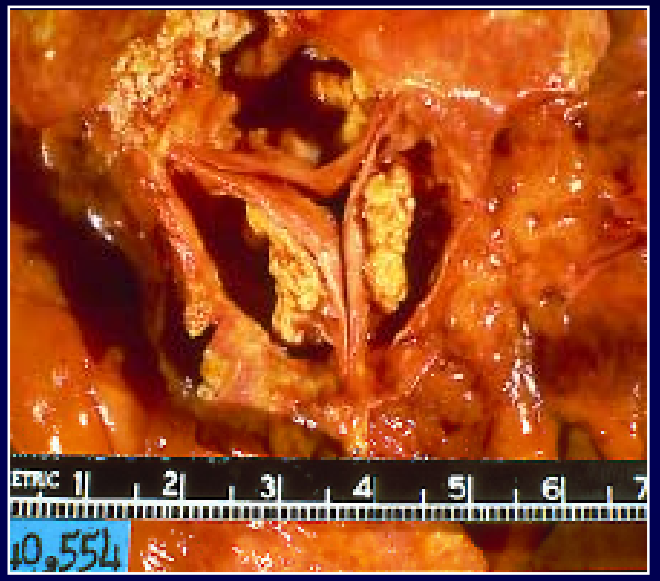
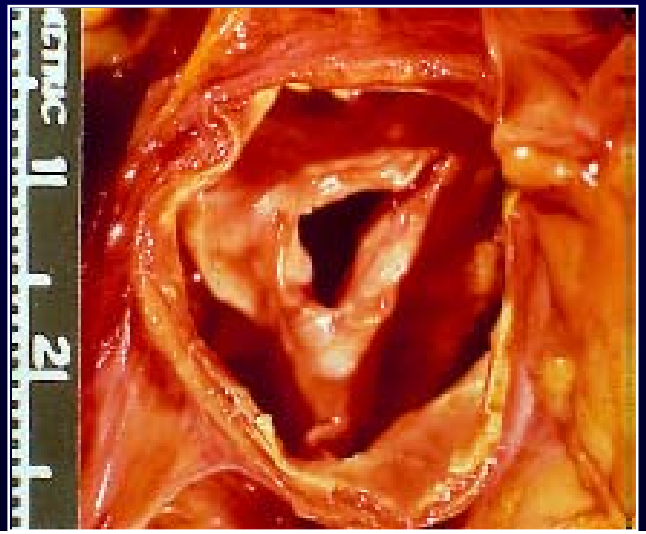
Evaluation and Treatment of the Asymptomatic AS patient

- Exercise Testing
- Indication for Surgery
- Statin Therapy

Aortic Stenosis





AORTIC STENOSIS

Classification of Severity

	Mild	Moderate	Severe
Jet velocity (m/s)	< 3.0	3.0-4.0	> 4.0
Mean grad (mmHg)	< 25	25-40	> 40
Valve area (cm^2)	> 1.5	1.0-1.5	< 1.0
Valve area index (cm^2/m^2)			< 0.6

Zoghbi W, et al. J Am Soc Echocardiogr 2003;16:777
2006 ACC/AHA Guideline. J Am Coll Cardiol 2006;48:e1

Indications for Surgery

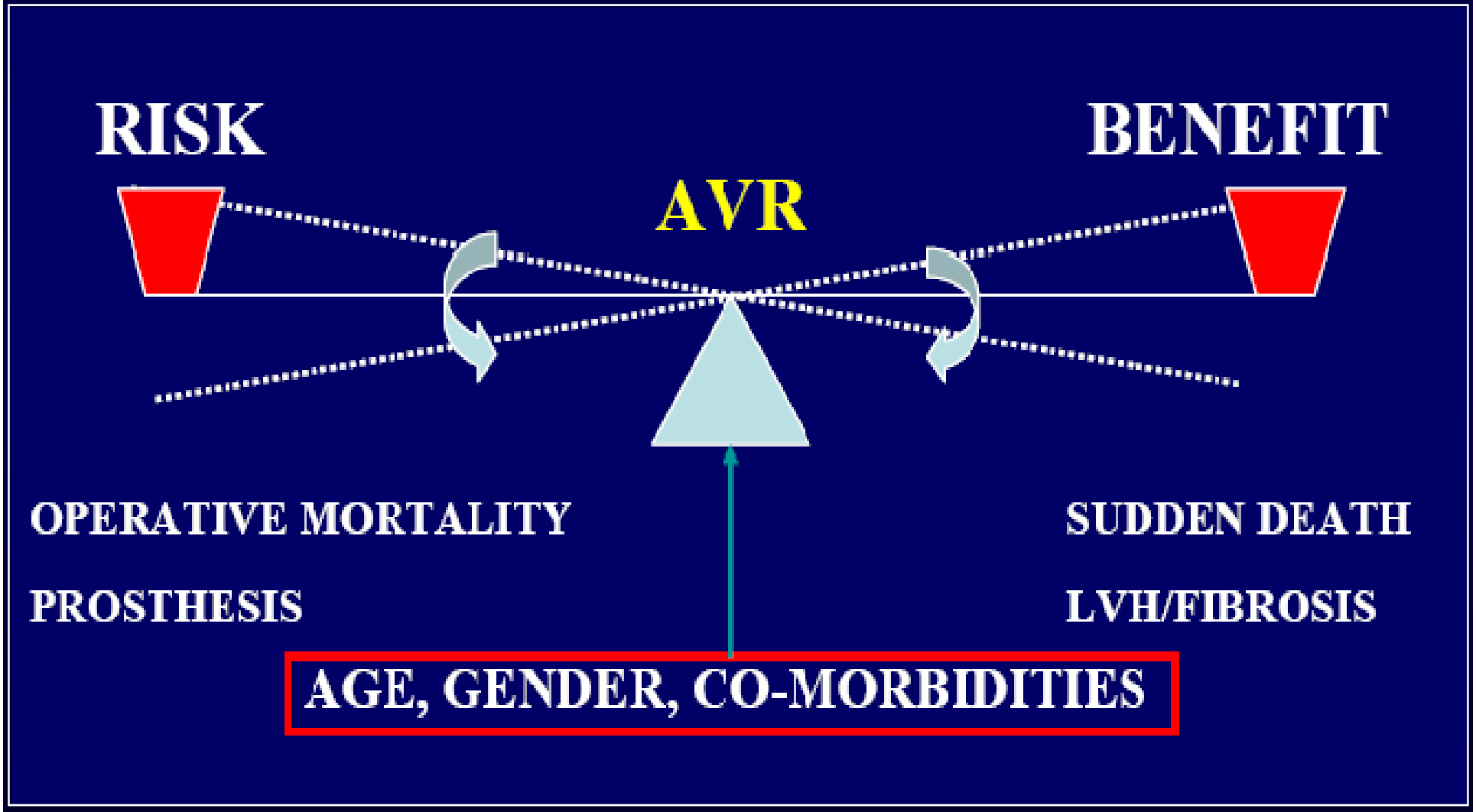
Severe AS

CLASS I

- **Symptoms**
- **Need for CABG or Aortic Surgery**
- **LV Dysfunction (EF < 0.50)**

ACC/AHA VALVE GUIDELINES 1998, 2006

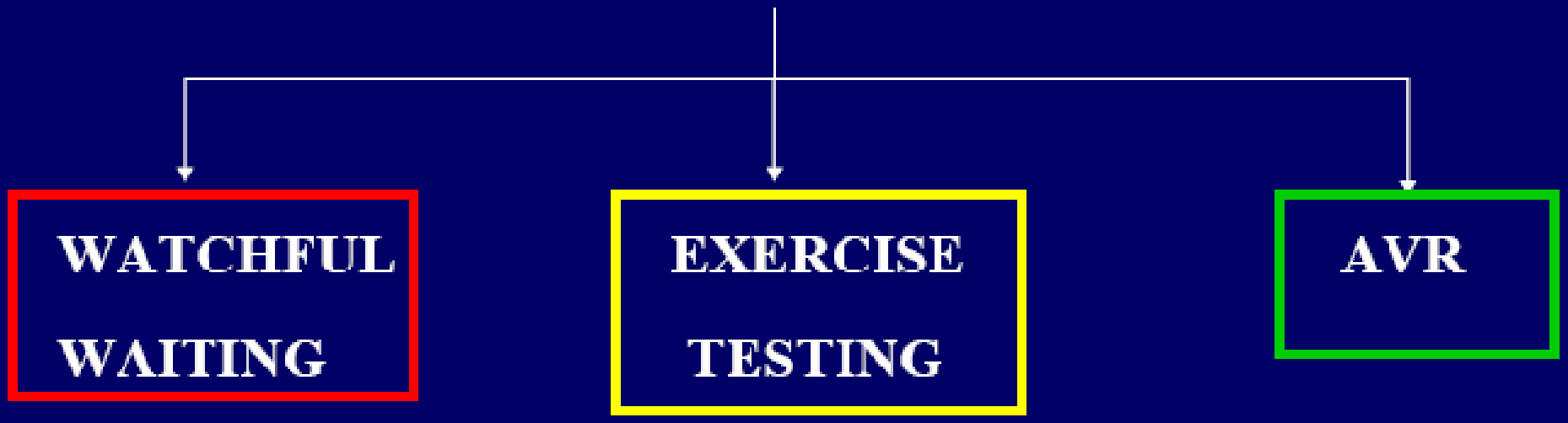
Considerations in the Asymptomatic Patient



CASE STUDY

84 YEAR OLD MAN

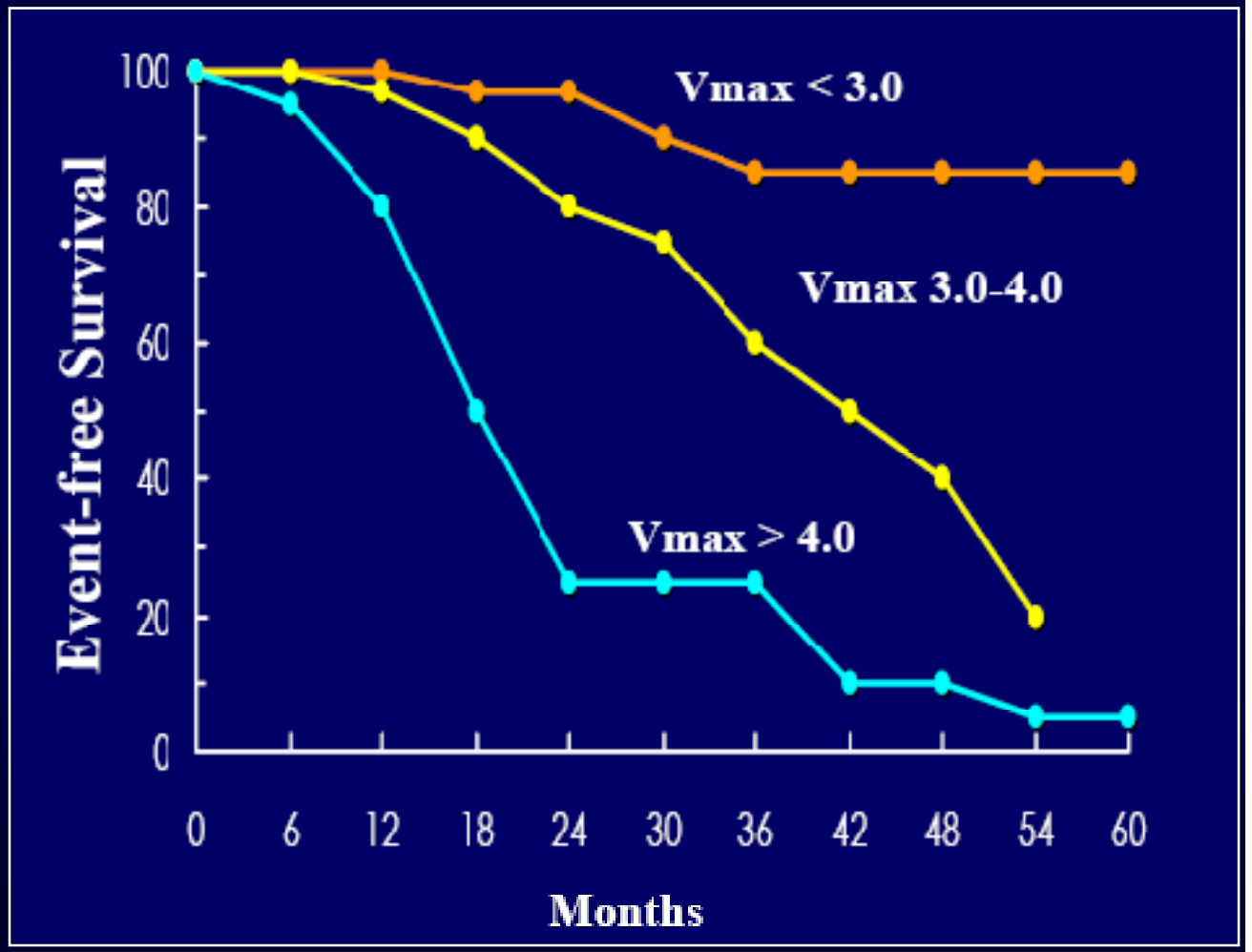
- ASYMPTOMATIC
- ECHO: Vmax 4.2 m/s, AVA 0.8 cm^2, EF 0.60



EVENT-FREE SURVIVAL

Predictors

- **V max**
- **ΔV max**
- **NYHA Class**



Otto CM, et al. Circulation 1997;95:2262

EVENT-FREE SURVIVAL

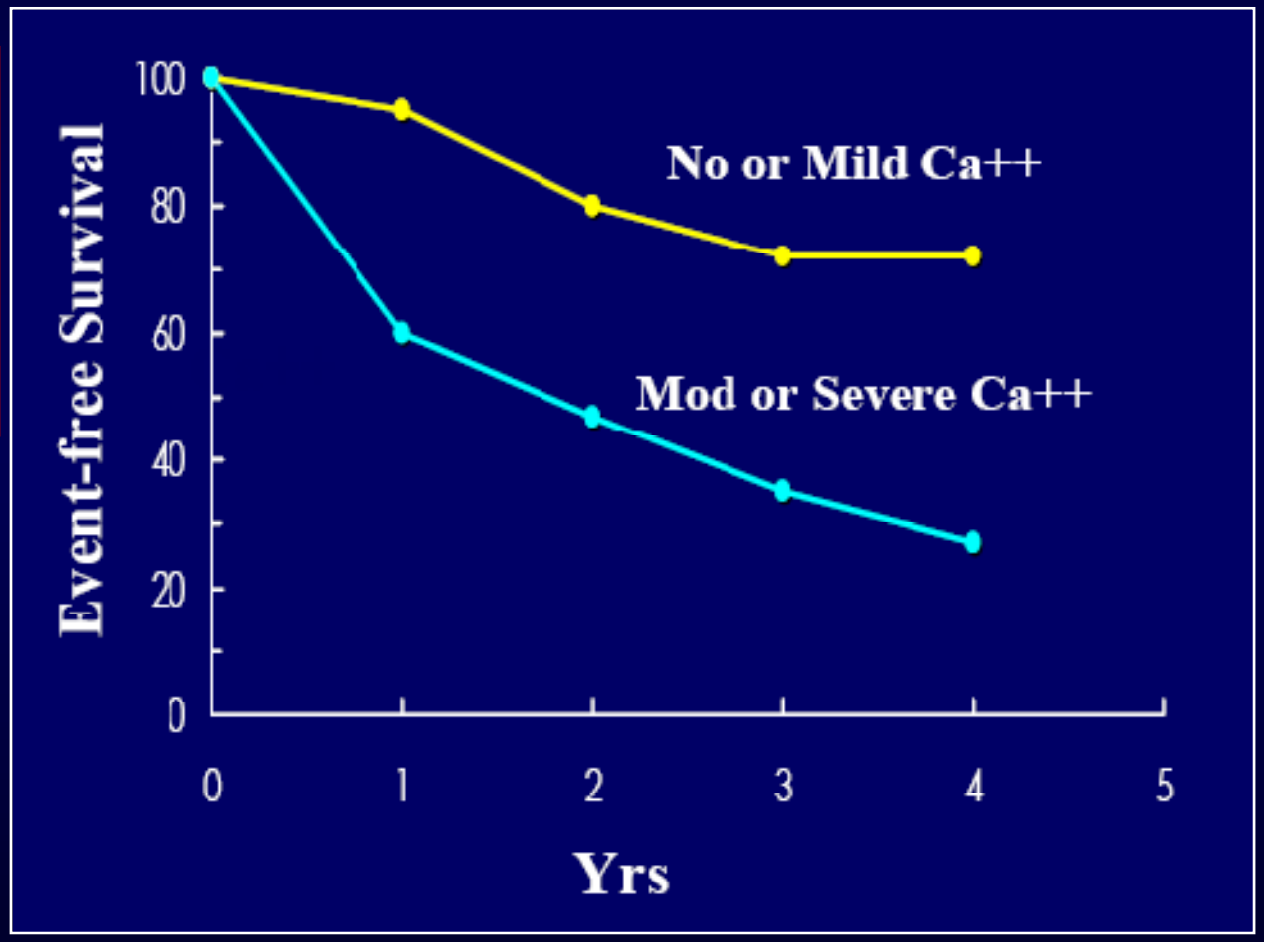
N = 126

V max > 5.0 m/s

1 SCD, 8 Total

Predictors

- **Calcium**
- **ΔV max**



Rosenhek R, et al. NEJM 2000;343:611

Asymptomatic Aortic Stenosis
Exercise Testing

Exercise test indicators of risk

- **Abnormal BP response**
- **NSVT (?)**
- **ST depression > 2 mm (?)**
- **Δ mean gradient (?)**
- **Symptoms……**

Otto CM, et al. Circulation 1997;95:2262
Das P, et al. JACC 2001;37 (suppl A):489A
Lancellotti P, et al. Circulation 2005;112:I377

Indications for Surgery
Severe, Asymptomatic AS
Class IIB

- Abnormal response to exercise
- High likelihood of rapid progression
- Delay from symptom onset to surgery
- "Extremely" severe AS (AVA < 0.6 cm^2, V max > 5.0 m/s) with low (< 1%) operative mortality risk

ACC/AHA VALVE GUIDELINES 1998, 2006

Indications for Surgery

Moderate AS

Class IIA

Need for

- CABG
- Other Valve
- Aortic Surgery

ACC/AHA VALVE GUIDELINES 1998, 2006

RISK of AVR

- ***Operative Risk****
  - **AVR 3-4 %**
  - **AVR/CABG 5-6 %**
- ***Lifetime Prosthesis Risk***
  - **1 % / yr**

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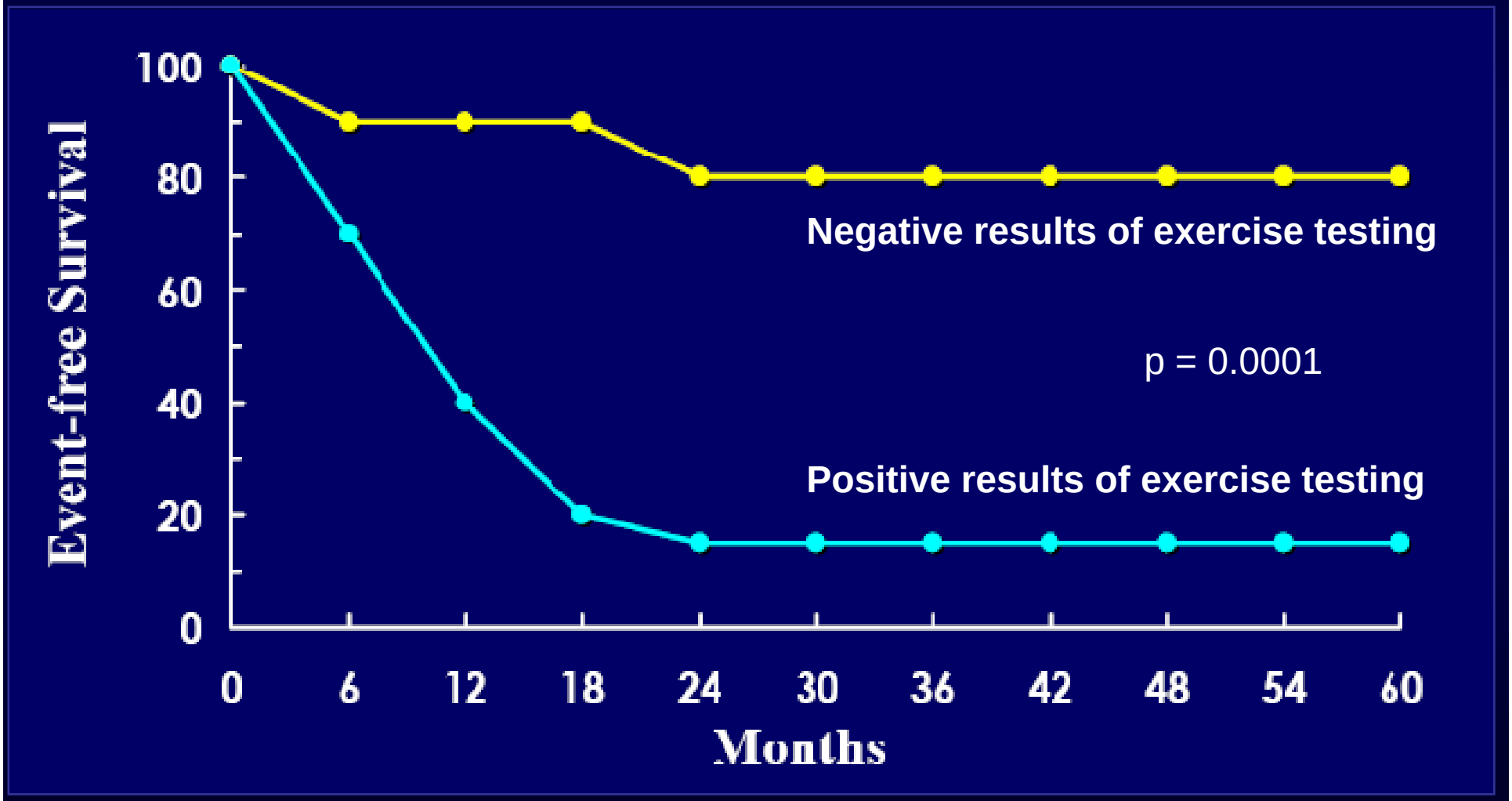
* STS 2006

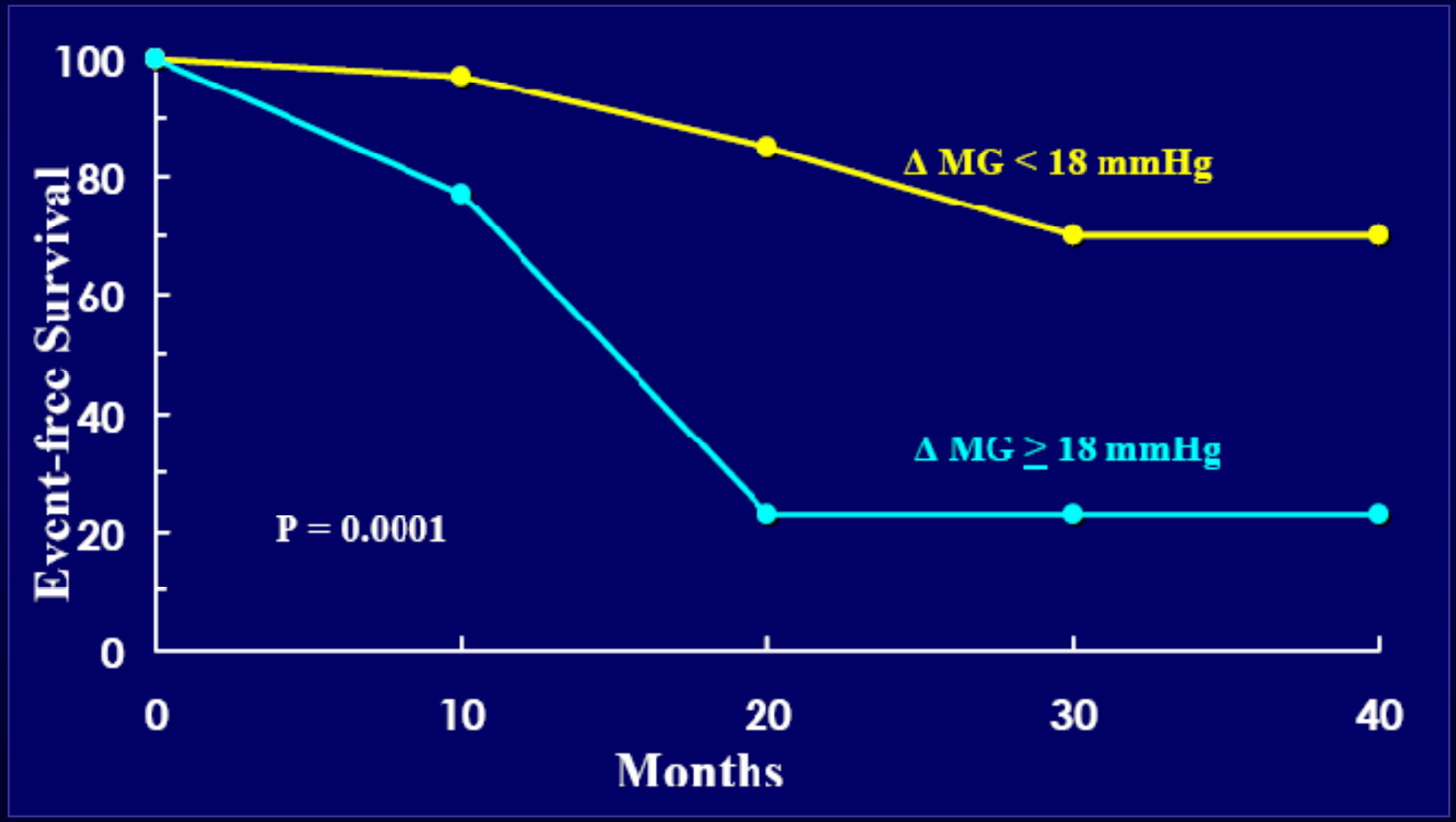
EXERCISE TESTING
Asymptomatic AS



Amato MCM, et al. Heart 2001;86:381

EXERCISE TESTING

Asymptomatic AS



Lancellotti P, et al. Circulation 2005;112:I377

Exercise testing in asymptomatic pts with AS

- To elicit symptoms
- To ascertain the need for aortic valve replacement

Exercise testing in asymptomatic pts with AS

- Exercise echocardiography facilitate interpretation of exercise elicited symptoms in asymptomatic pts with severe AS
- Abnormal LV response to exercise may predict a poor outcome

Determinants of an abnormal response to exercise

- Larger increase in mean transaortic pressure gradient (PG)
- Limited contractile reserve: inadequate increase in EF at exercise

- Increased in PG: smaller exercise-induced changes in AV area & in EF & new or worsening MR during exercise

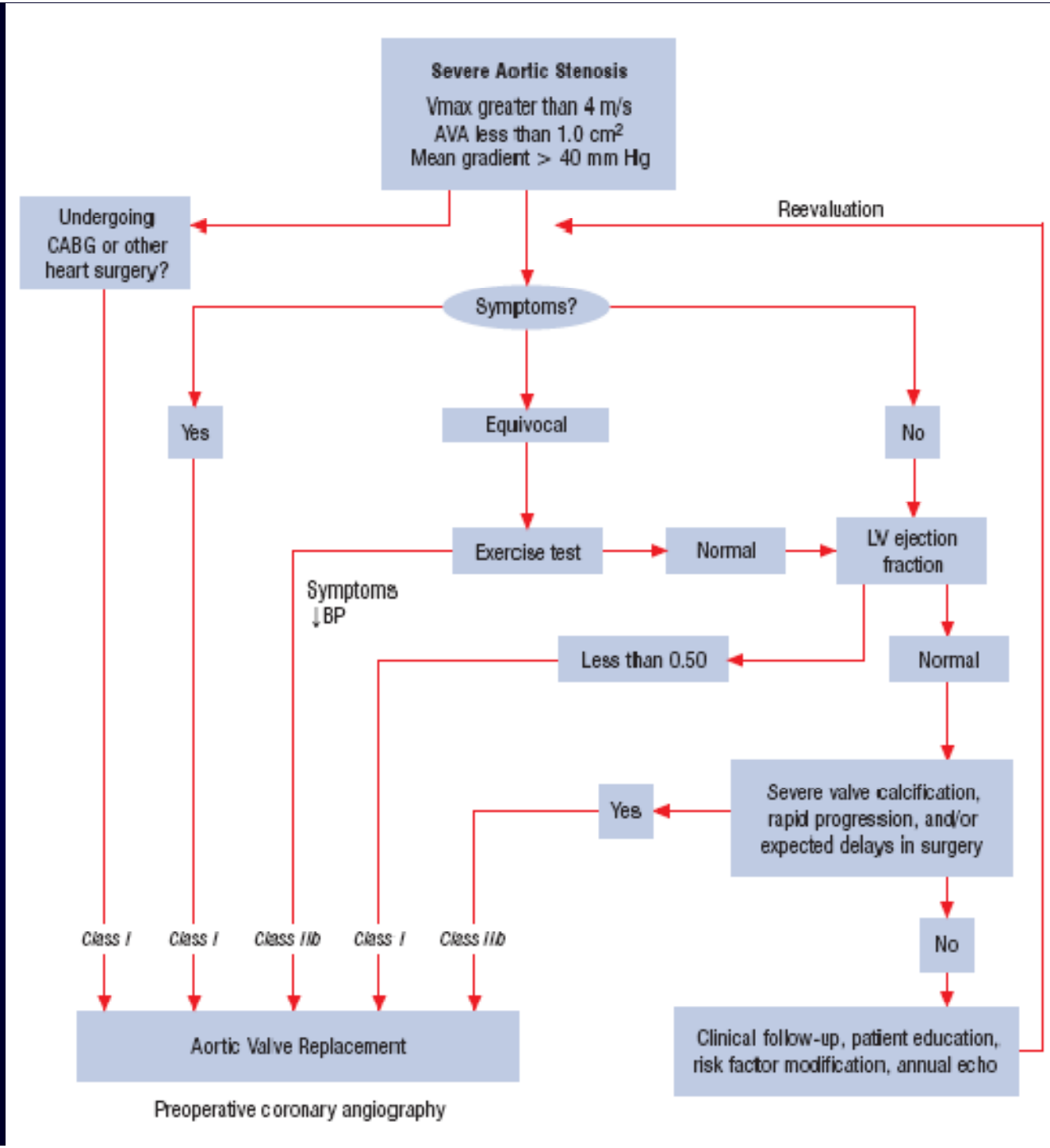
Lancellotti P, et al. Eur J Echocardiogr 2007

Asymptomatic AS
When to operate, when to follow?

- Risk stratification with selection of those pts who are likely to develop symptoms and require surgery within a short time period
- The most important predictors of outcome
  - The degree of valvular calcification
  - The hemodynamic progression rate
  - The development of symptoms during exercise testing
  - Plasma levels of cardiac neurohormones

Baumgartner H. Herz 2006;31:664

Management Strategy for pts with Severe AS



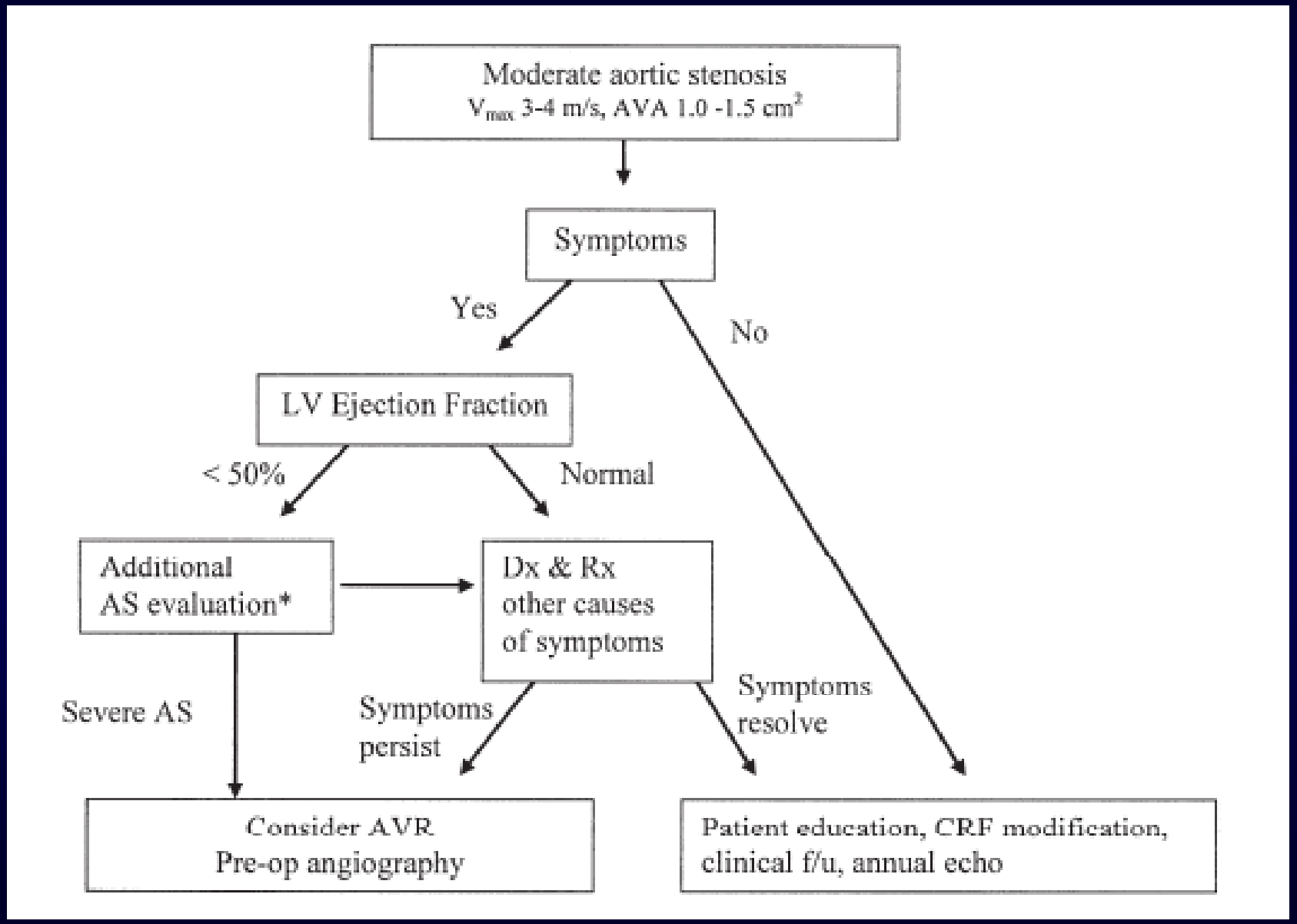
2006 ACC/AHA Guideline. J Am Coll Cardiol 2006;48:e1

Indications for Surgery in Asymptomatic AS

	Class
Asymptomatic patients with severe AS and systolic LV dysfunction (LV EF < 50%) unless due to other cause	IC
Asymptomatic patients with severe AS and abnormal exercise test showing symptoms on exercise	IC
Asymptomatic patients with severe AS and moderate to severe valve calcification, and a rate of peak velocity progression ≥ 0.3 m/sec. per year	IIaC
Asymptomatic patients with severe AS and abnormal exercise test showing fall in blood pressure below baseline	IIaC
Asymptomatic patients with severe AS and abnormal exercise test showing complex ventricular arrhythmias	IIbC
Asymptomatic patients with severe AS and excessive LV hypertrophy (≥ 15mm) unless this is due to hypertension	IIbC

2007ESC Guidelines

Evaluation of adults with moderate AS



Otto CM. J Am Coll Cardiol 2006;47:2141

Asymptomatic AS Patients

- Even with severe AS, the risk of sudden death is low (<1%) in the asymptomatic patient.
- Risk of surgery: <1% in a 55 YO man with no other medical conditions
- Operative mortality:
  7% for an 85 YO woman with HTN and CAD
  > 24% for an 80 YO man with CAD, prior cardiac surgery, and renal dysfunction

Ambler G, et al. Circulation 2005;112:224

Asymptomatic AS Patients

- The balance is shifted towards watchful waiting until symptoms supervene.
- Appropriate management
  - Patient education about symptoms
  - The importance of promptly seeking medical attention once symptoms are present
  - Periodic echocardiography
  - Cardiovascular risk factor reduction
- In pts with asymptomatic moderate-to-severe AS who are undergoing other cardiac surgery, valve replacement should be considered.

Otto CM. J Am Coll Cardiol 2006;47:2141

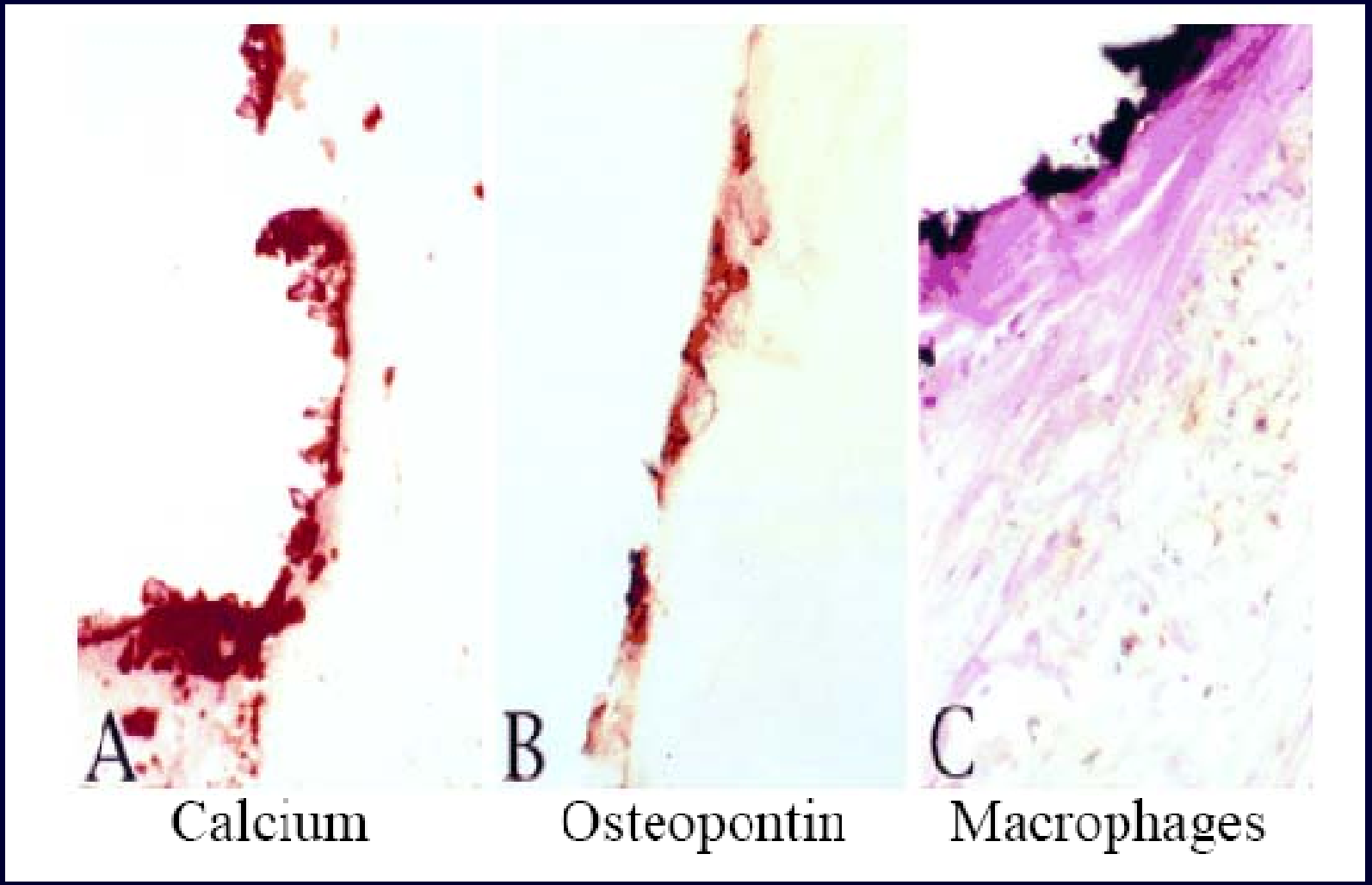
AORTIC SCLEROSIS

Focal Thickening/Calcification with Velocity < 2.5 m/sec

5 YR EVENT	NL (n=3919)	Ao Scler (n=1610)	AS (n=92)	P (trend)
Death	14.9%	21.9%	41.3%	<0.001
CV death	6.1%	10.1%	19.6%	<0.001
MI	6.0%	8.6%	11.3%	<0.001

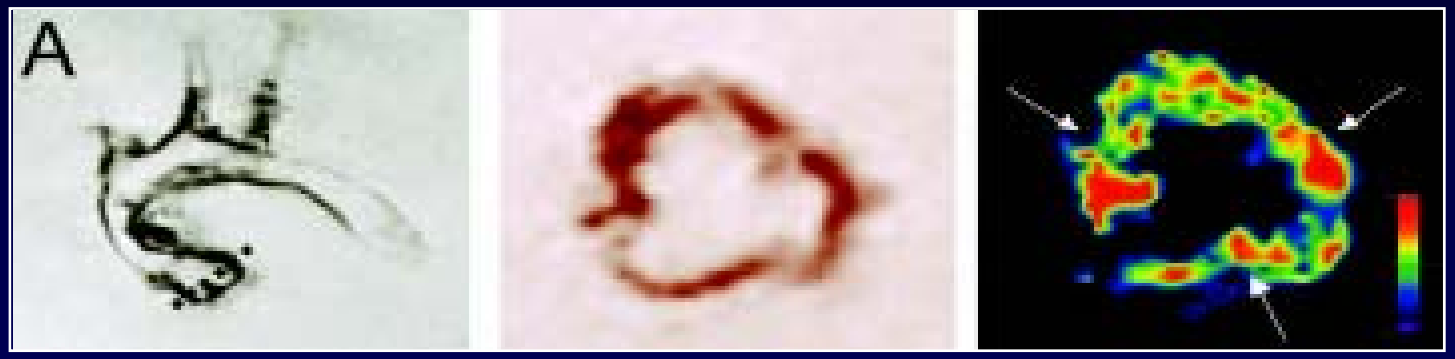
Otto CM et al. CV Health Study. *N Engl J Med*. 1999;341:132

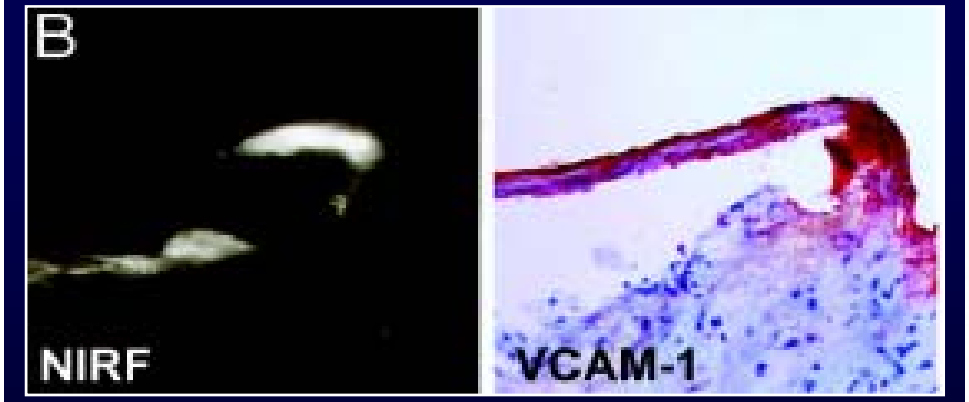
Aortic Stenosis

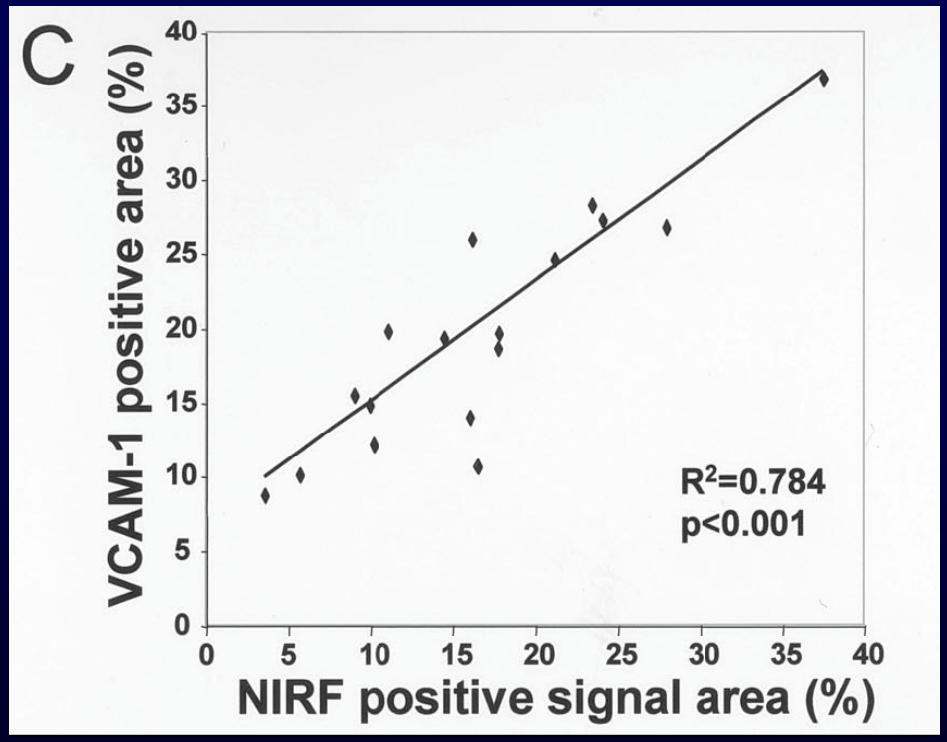


Mohler ER et al. Arterioscler Thromb Vasc Biol 1997;17:547

Endothelial cell activation in diseased aortic valves

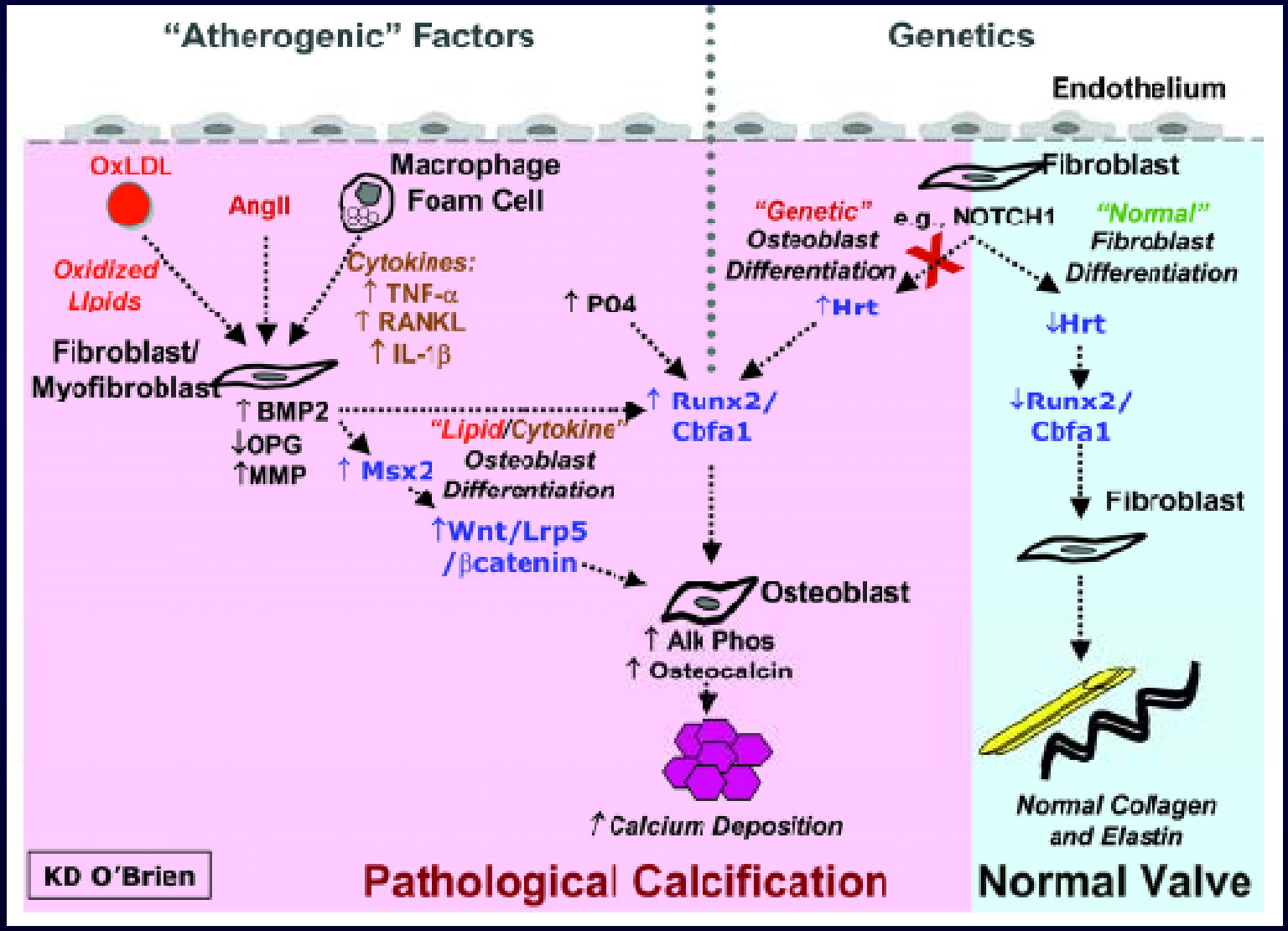






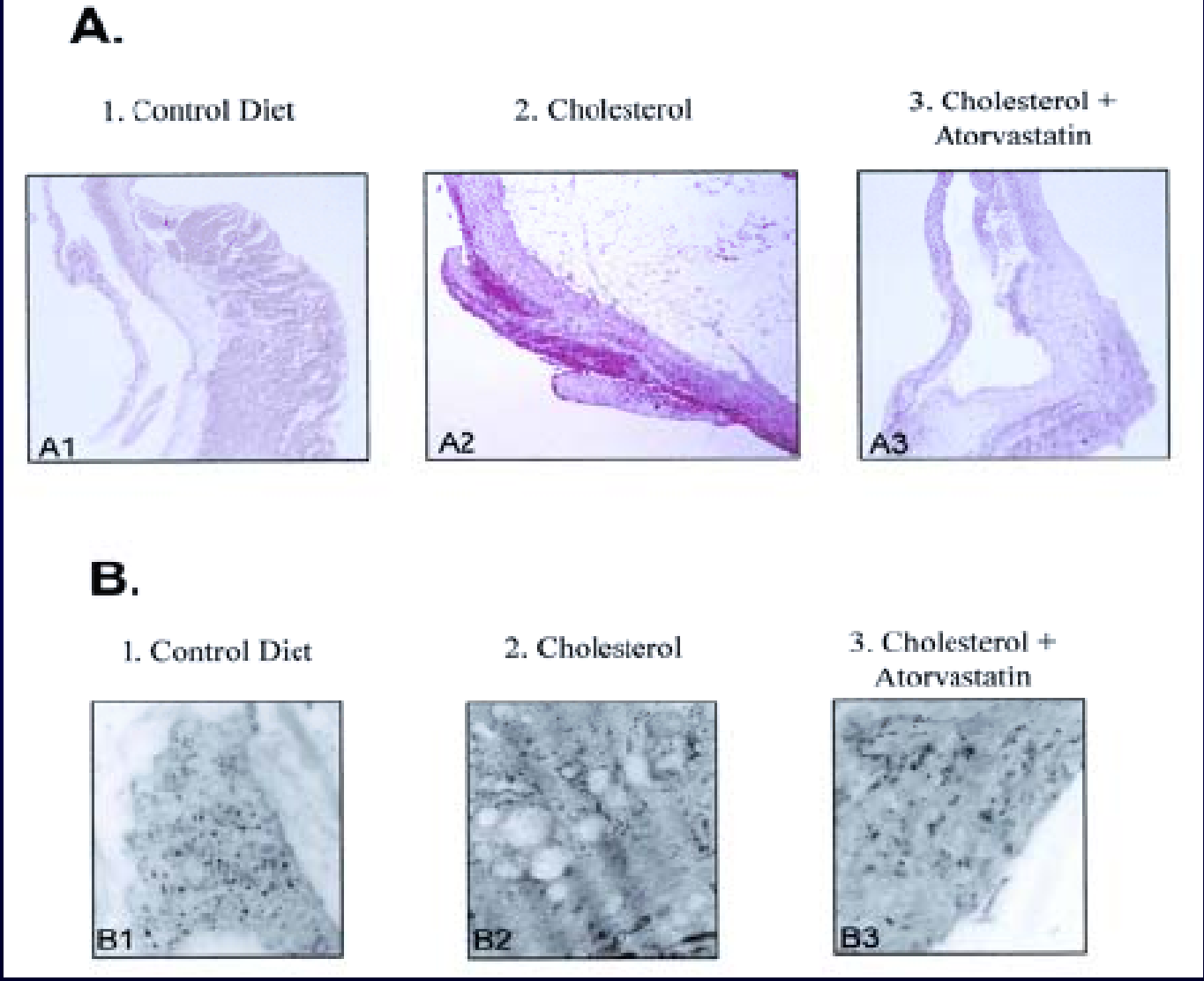
Aikawa E. et al. Circulation 2007;115:377

Lipids, Inflammation and Genetics in the Pathogenesis of Valve Calcification



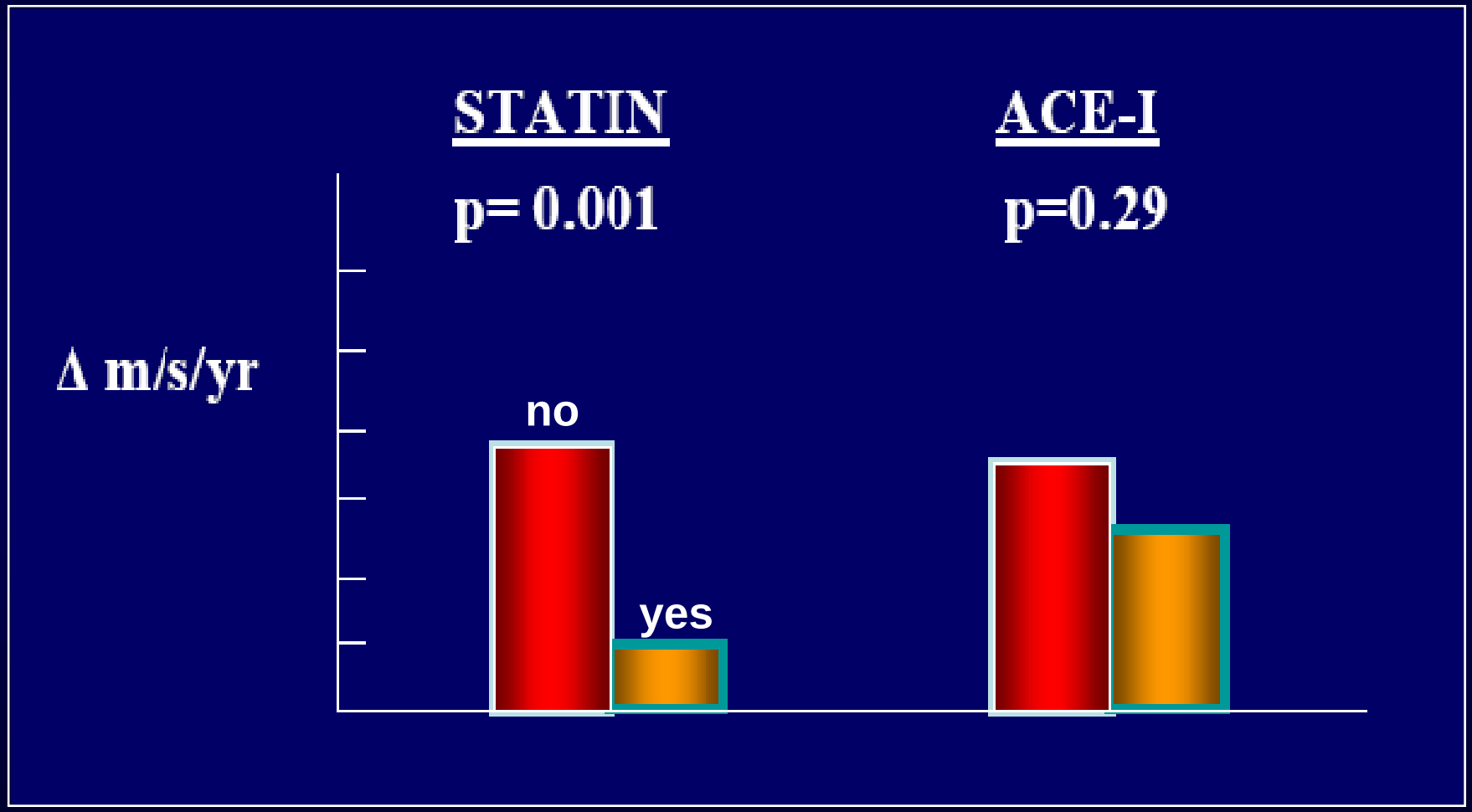
O'Brien KD. Arterioscler Thromb Vasc Biol 2006;26:1721

AORTIC STENOSIS
Effect of Statins



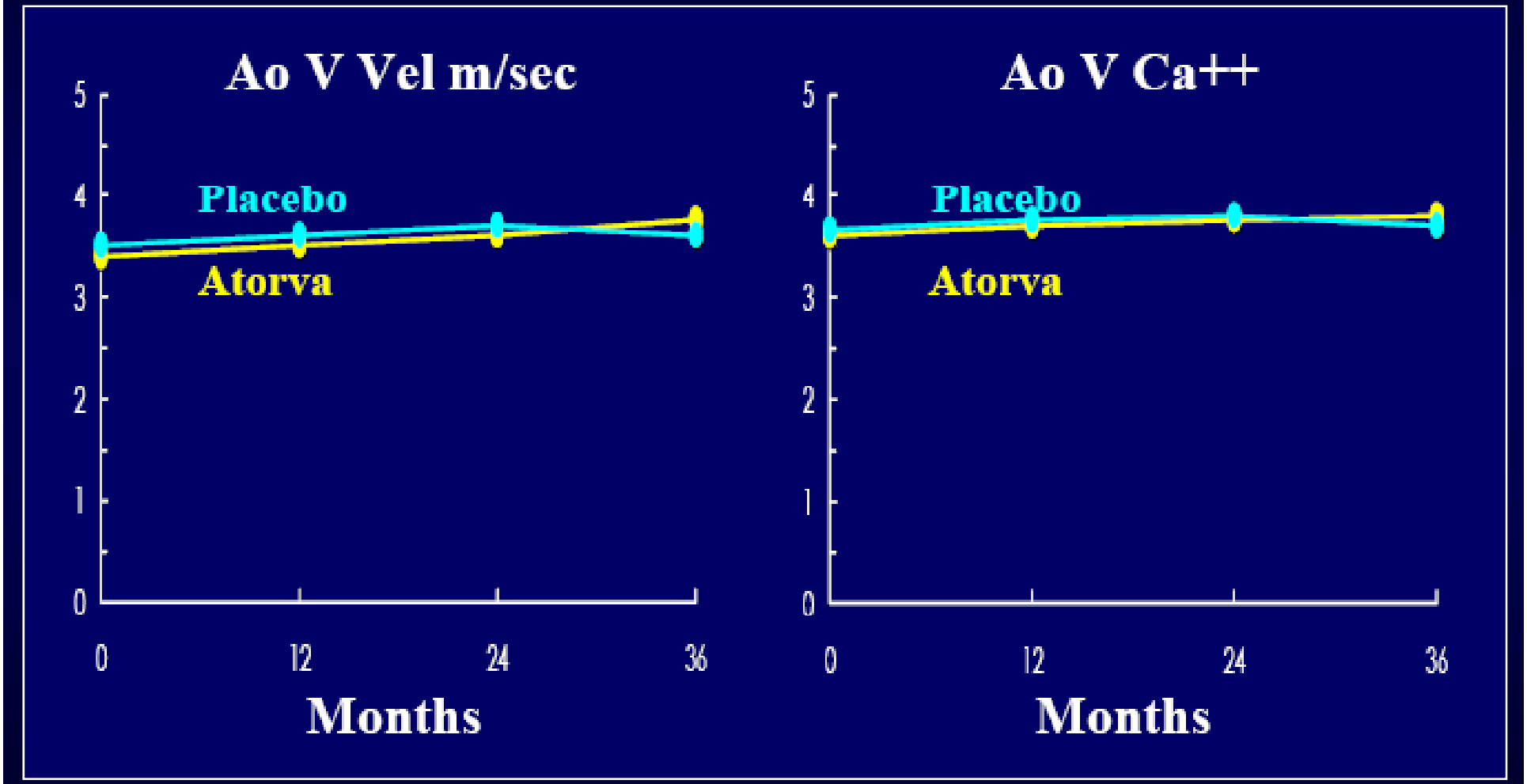
Rajamannan NM et al. Ciruclation 2002;105:2660

AORTIC STENOSIS
Rate of Progression



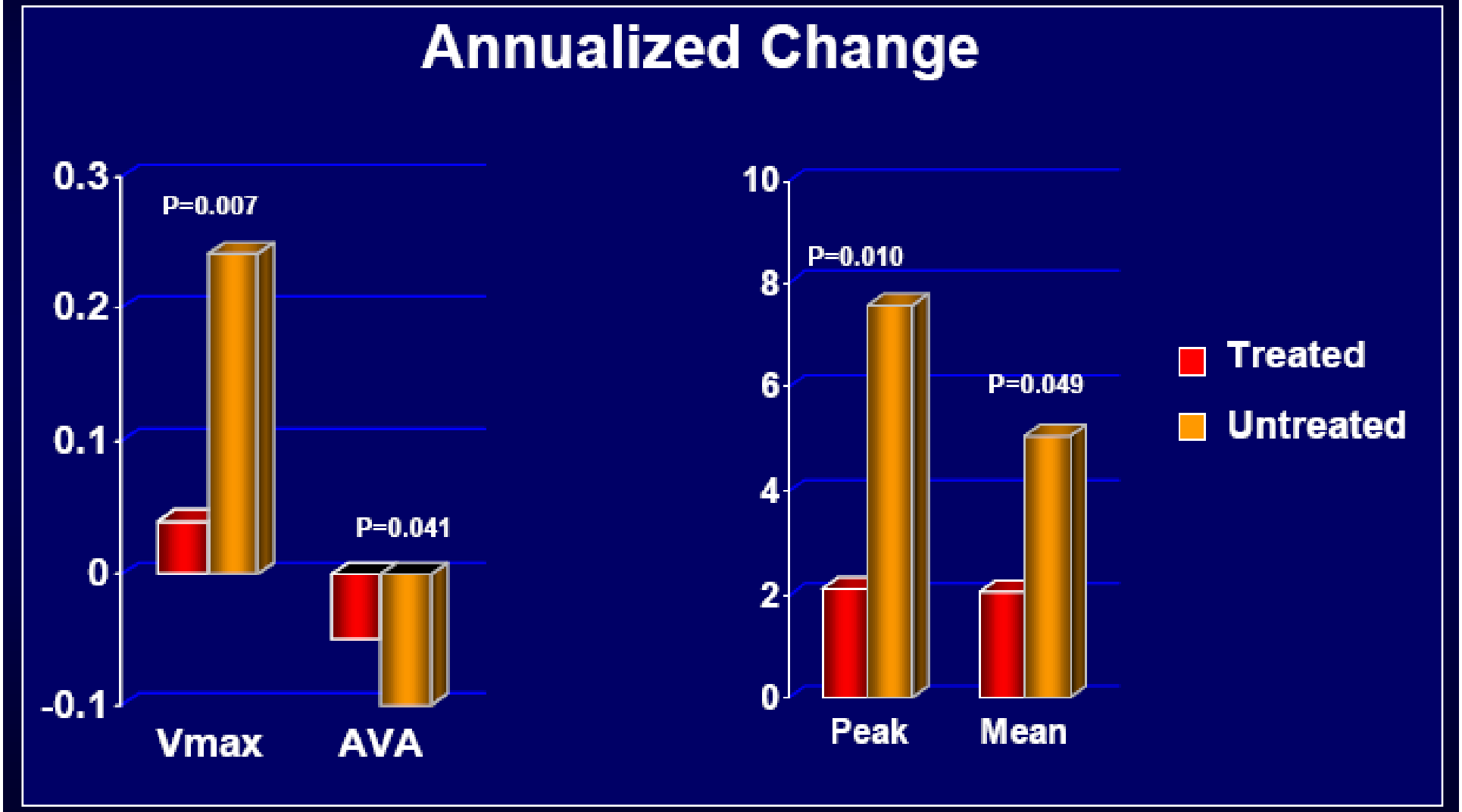
Rosenhek R. et al. Circulation 2004;110:1291

AORTIC STENOSIS
Effects of Atorvastatin



Cowell SJ. et al. (SALTIRE) NEJM 2005;352:2389

Effects of Rosuvastatin on Progression of Aortic Stenosis



Moura LM, et al. (RAAVE). J Am Coll Cardiol 2007;49:554

Simvastatin and ezetimibe in AS (SEAS) Study

- Randomized, double-blind, placebo-controlled, multicenter study of a minimum 4 yrs' duration
- Effect of lipid lowering with ezetimibe/simvastatin 10/40 mg/day in pts with asymptomatic AS with peak transvalvular jet velocity 2.5-4.0 m/s
- Primary efficacy variables: AV surgery & ischemic vascular events, including C-V mortality
- Effect on echo. evaluated progression of AS
- 1,873 patients (68+/-10 years, 39% women, mean maximum velocity 3.1+/-0.5 m/s) from 173 sites
- The SEAS Study is the largest randomized trial to date in pts with AS

Rossebo AB, et al. Am J Cardiol 2007;99:970

AS Progression Observation: Measuring Effects of Rosuvastatin (ASTRONOMER) trial

- Double-blind, placebo-controlled study, f/u 3-5 yrs
- Pts with mild to moderate AS are randomized to receive 40 mg/d of rosuvastatin or placebo.
- To determine whether pts with AS randomized to rosuvastatin will experience less progression in AS severity (aortic transvalvular gradients & AVA).
- To determine the effect of rosuvastatin on the rate of cardiac death and AVR and to assess the time to outcome
- Younger (58.1 +/- 13.6 years), less severe AS (AS jet velocity 3.2 +/- 0.4 m/s), great proportion (48.9%) of pts with bicuspid AV

Chan KL, et al. Am Heart J 2007;153:925

감사합니다.