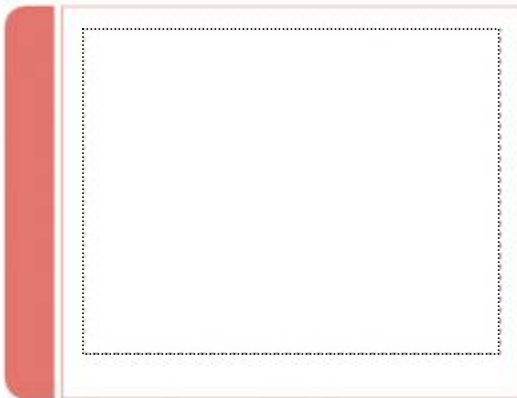


A Suitable Surgical Patient – Aortic Stenosis



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care
education
research

Partners in Academic Medicine



PATIENTS. AT THE HEART OF ALL WE DO.

Members of the SingHealth Group



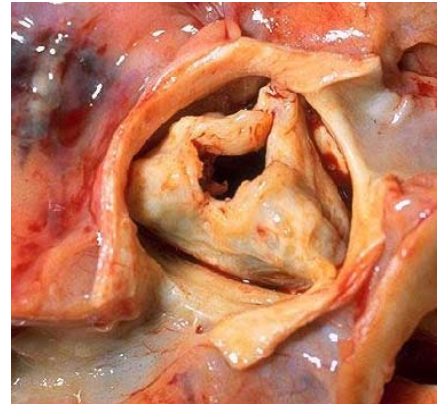
Aortic Stenosis - Aetiology

Most common valvular heart disease

Commonest causes are:



Degenerative Calcific



Rheumatic



Bicuspid Congenital

Rarer:

Paget's , Fabry's, irradiation,

Aortic stenosis – symptoms and signs

Exertional angina

Exertional dyspnoea

Exertional dizziness/lightheadedness

Leading to

Chest pain, heart failure and syncope

Aortic stenosis – signs and symptoms

O/E:

Pulsus parvus et tardus

Narrowed pulse pressure

Heaving apex

Auscultation:

ESM aortic area radiating to carotids

Can be heard in the apex (Gallavardin phenomenon)

Soft S2

Paradoxical splitting (P2 precedes, comes closer to A2 in inspiration)

S4

The more severe, the longer and later peaking the murmur.

Accentuated with squatting

Patient AB

69-year old Chinese male

Cardiac risk factors:

Smoker

Type II Diabetic

Presented with some dyspnoea; NYHA II. No ankle oedema/PND/orthopnoea.

No chest pain.

No Syncope.

O/E: S1 + S2 ESM in aortic area radiating to R carotid

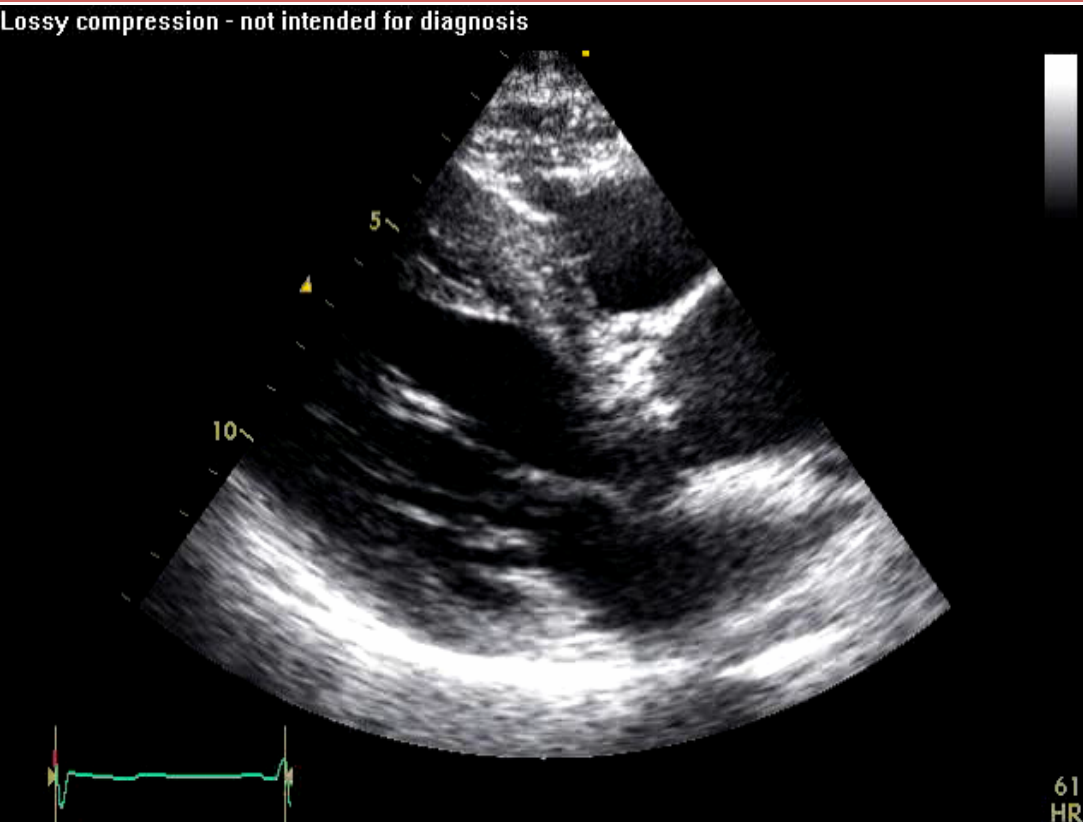
Slightly heaving apex.

BP 140/70

Not clinically in failure.

ECHOCARDIOGRAM

Lossy compression - not intended for diagnosis



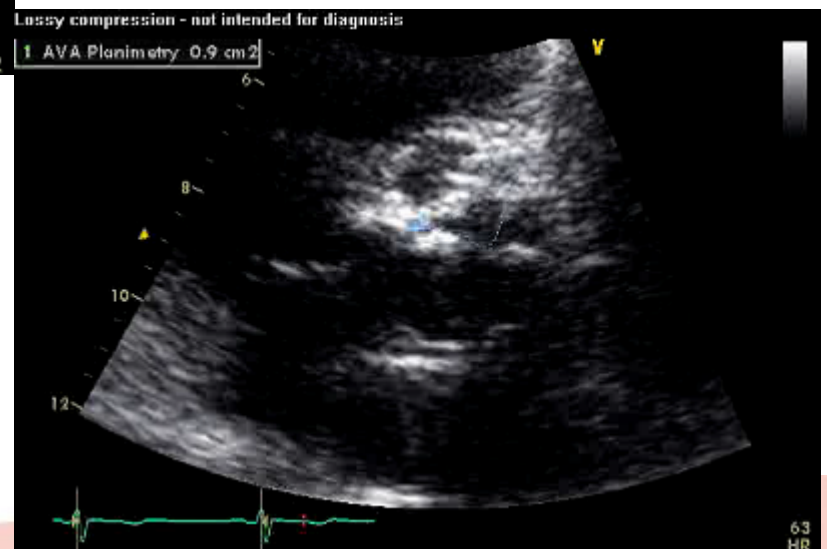
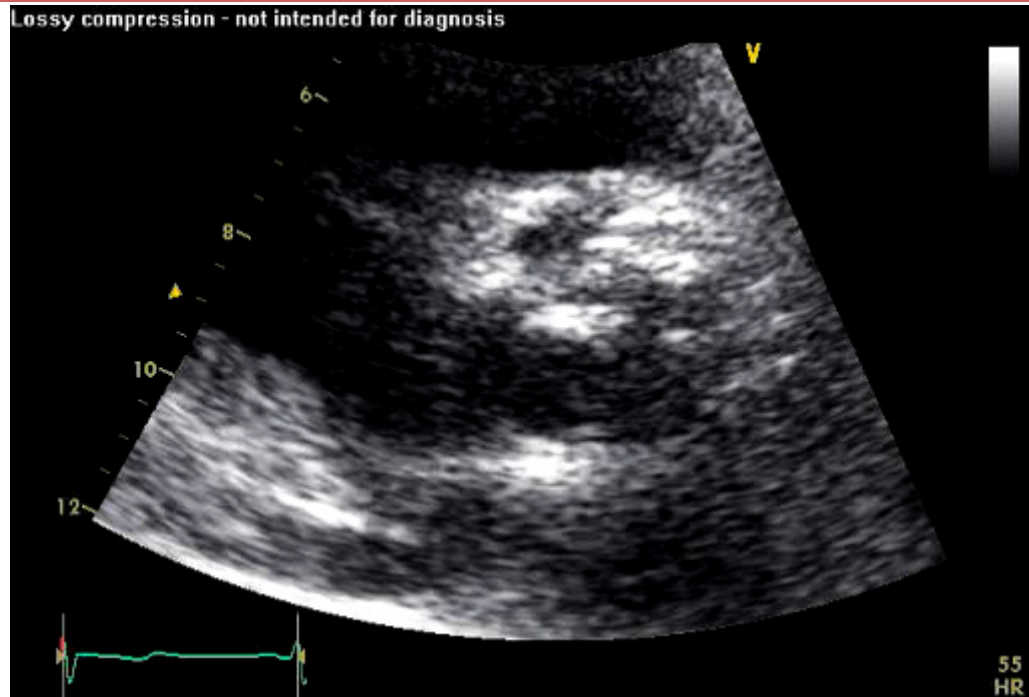
LVEF 54%. No RWMA.
 Concentric LVH.
 Tricuspid degenerative aortic valve.
 Severe aortic cusp calcification.
 Severe aortic stenosis, MPG **56.28**mmHg.
 AVA **0.721** cm².
 AoVmax **4.7**m/s

Table 2 Grading aortic stenosis

	Mild	Moderate	Severe
AoV _{max} (m/s)	2.5–3.0	3.0–4.0	>4.0
Peak gradient (mmHg)	<40	40–65	>65
Mean gradient (mmHg)	<20	20–40 (50) ^a	>40 (50) ^a
EOA (cont eq) (cm ²)	>1.5	1.0–1.5	<1.0
EOAi (cm ² /m ²)	>0.85	0.60–0.85	<0.60
Velocity ratio	>0.50	0.25–0.50	<0.25

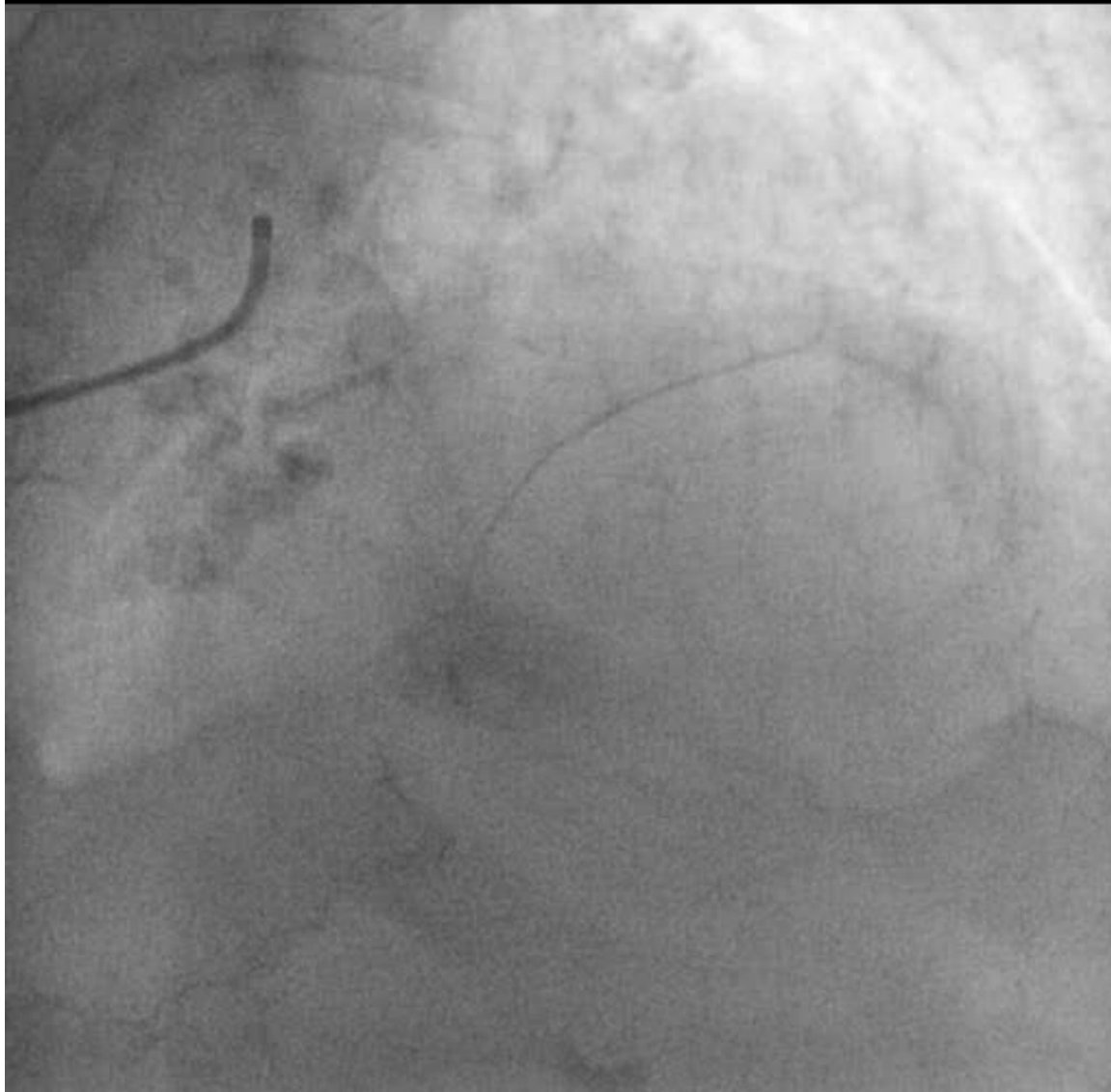
^aEAE guidelines only,²⁰ otherwise both EAE and ASE.^{19,20}

ECHOCARDIOGRAM

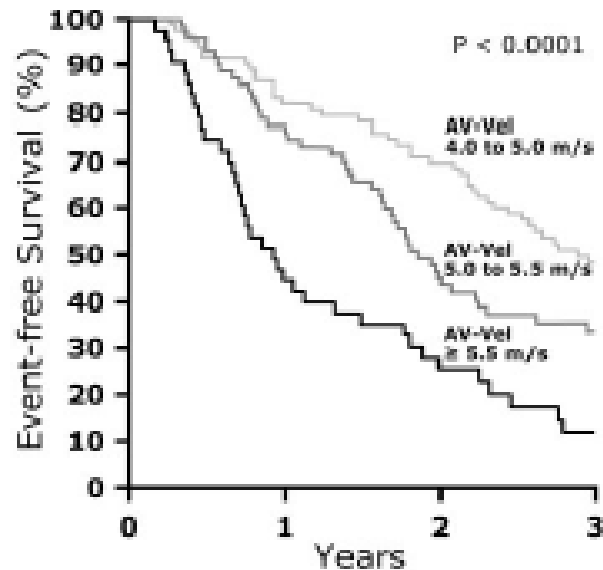


Coronary angiogram

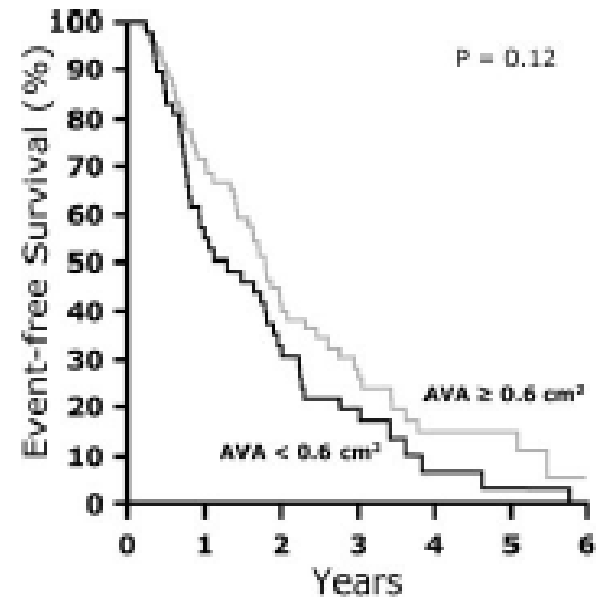
Lossy compression - not intended for diagnosis



Aortic Stenosis – Natural History



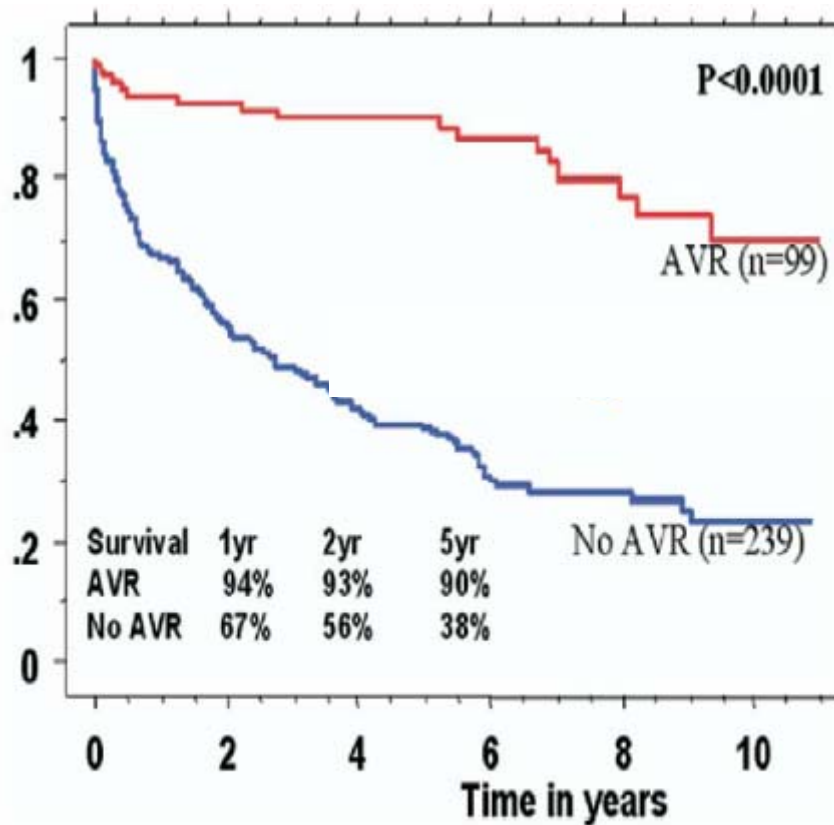
Patients with AV-Vel from 4.0 to 5.0 m/s			
Pts. at risk:	82	69	59
			38
Patients with AV-Vel from 5.0 to 5.5 m/s			
Pts. at risk:	72	53	29
			18
Patients with AV-Vel ≥ 5.5 m/s			
Pts. at risk:	44	20	11
			5



Patients with AVA ≥ 0.6 cm ²						
Pts. at risk:	69	47	25	14	7	5
						2
Patients with AVA < 0.6 cm ²						
Pts. at risk:	47	26	15	9	2	1
						0

Natural History of Very Severe Aortic Stenosis
 Raphael Rosenhek, Robert Zilberszac, Michael Schemper, Martin Czerny, Gerald Mundigler, Senta Graf, Jutta Bergler-Klein, Michael Grimm, Harald Gabriel and Gerald Maurer
Circulation 2010;121:151-156; originally published online Dec 21, 2009;

Aortic stenosis -intervention



Pai et al; ATS 2006; 82:2116

Aortic Stenosis – Natural History

Predictors of the progression of AS and, therefore, of poor outcome in asymptomatic patients have recently been identified. They are:

- Clinical: older age, presence of atherosclerotic risk factors.^{65,66}
- Echocardiography: valve calcification, peak aortic jet velocity, LVEF,^{71,72} haemodynamic progression,⁷¹ and increase in gradient with exercise.²⁵ The combination of a markedly calcified valve with a rapid increase in velocity of ≥ 0.3 m/s within 1 year has been shown to identify a high-risk group of patients (~80% death or requirement of surgery within 2 years⁷¹).
- Exercise testing: symptom development on exercise testing in physically active patients, particularly those younger than 70 years, predicts a very high likelihood of symptom development within 12 months. Recent data demonstrates a lower positive predictive value for abnormal blood pressure response, and even more so for ST-segment depression, than symptoms for poor outcome.²²

As soon as symptoms occur, the prognosis is dismal and mortality has been reported to be quite significant even within months of symptom onset,⁷³ which is often not promptly reported by patients.

Guidelines on the management of valvular heart disease

The Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology

ESC Indications for Surgery in Aortic Stenosis

Table 7 Indications for aortic valve replacement in aortic stenosis

	Class
Patients with severe AS and any symptoms	IB
Patients with severe AS undergoing coronary artery bypass surgery, surgery of the ascending aorta, or on another valve	IC
Asymptomatic patients with severe AS and systolic LV dysfunction (LVEF <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 abnormal exercise test showing fall in blood pressure below baseline	IIaC
Patients with moderate AS ^a undergoing coronary artery bypass surgery, surgery of the ascending aorta or another valve	IIaC
Asymptomatic patients with severe AS and moderate-to-severe valve calcification, and a rate of peak velocity progression ≥ 0.3 m/s per year	IIaC
AS with low gradient (<40 mmHg) and LV dysfunction with contractile reserve	IIaC
Asymptomatic patients with severe AS and abnormal exercise test showing complex ventricular arrhythmias	IIbC
Asymptomatic patients with severe AS and excessive LV hypertrophy (≥ 15 mm) unless this is due to hypertension	IIbC
AS with low gradient (<40 mmHg) and LV dysfunction without contractile reserve	IIbC

AS = aortic stenosis, EF = ejection fraction, LV = left ventricular.

^aModerate AS is defined as valve area 1.0–1.5 cm² (0.6 cm²/m² to 0.9 cm²/m² BSA) or mean aortic gradient 30–50 mmHg in the presence of normal flow conditions. However, clinical judgement is required.



European Heart Journal (2007) 28, 230–268
doi:10.1093/eurheartj/ehl428

ESC Guidelines

Guidelines on the management of valvular heart disease

The Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology

Treatment and progress

Started on beta-blockers

Planned for elective AVR – decided on bioprosthetic valve.

Had coronary angiography done, which showed mid LAD disease 70%.

Hence had AVR with CABG – LIMA to LAD.

Asymptomatic and well since then.

