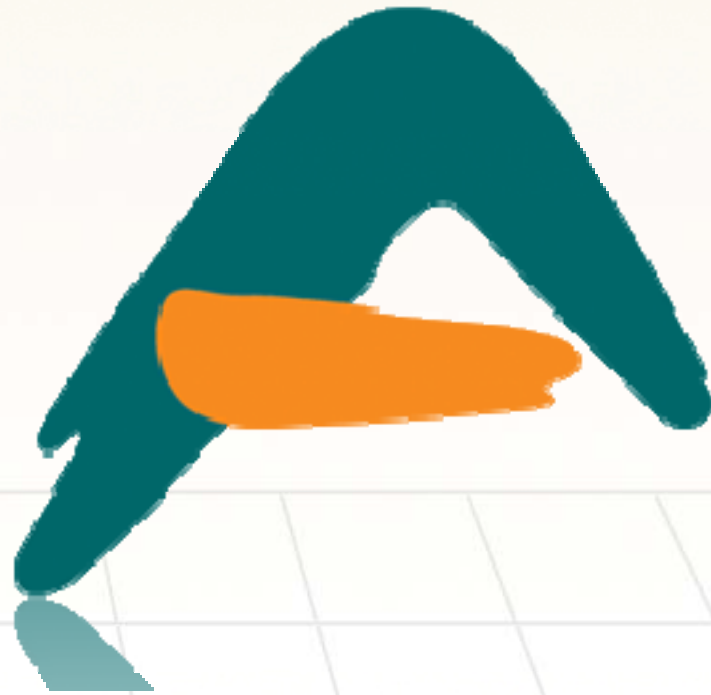
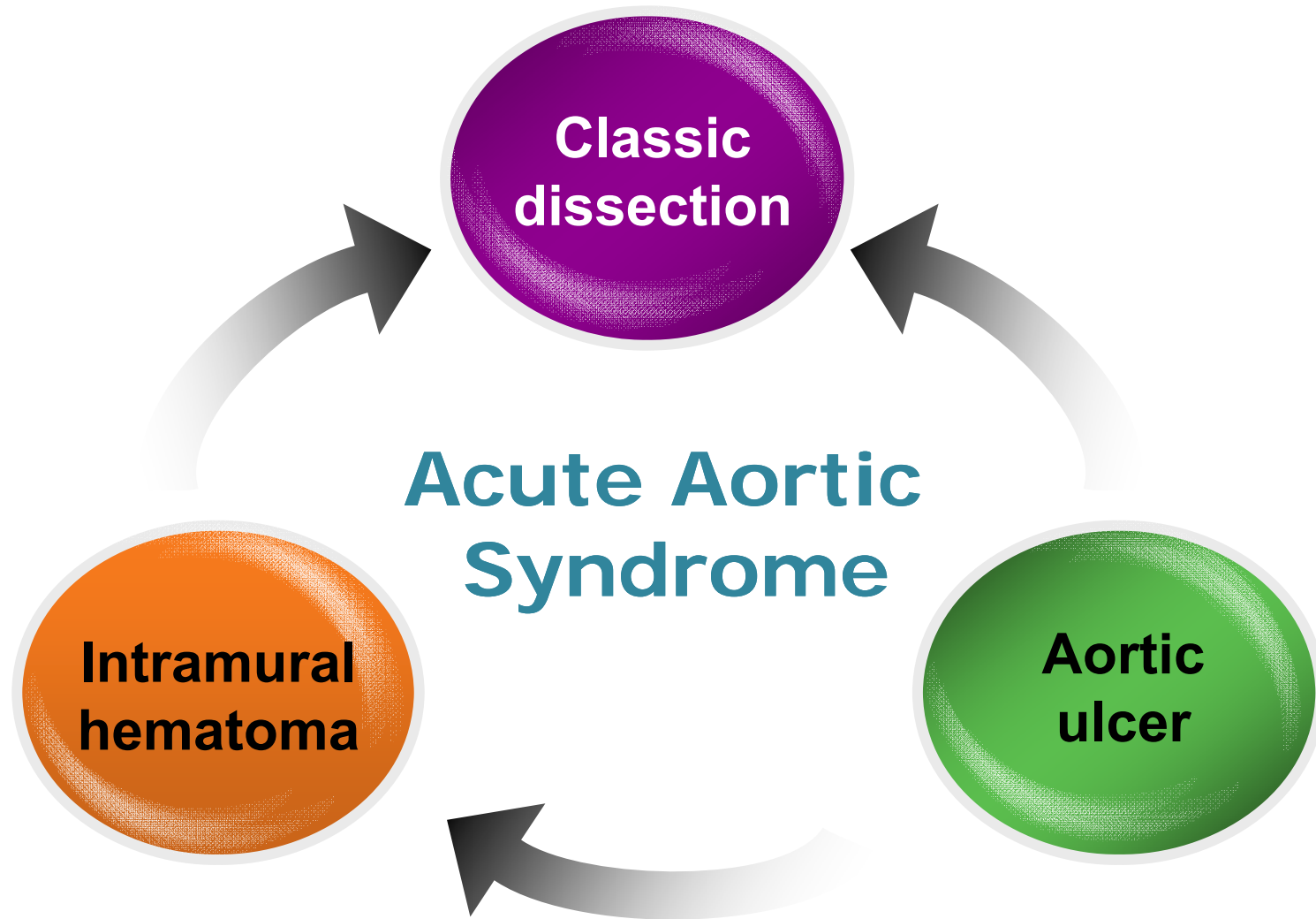


Fate of Distal Intramural Hematoma with Focal Contrast Enhancement : To Stent or Not To Stent?

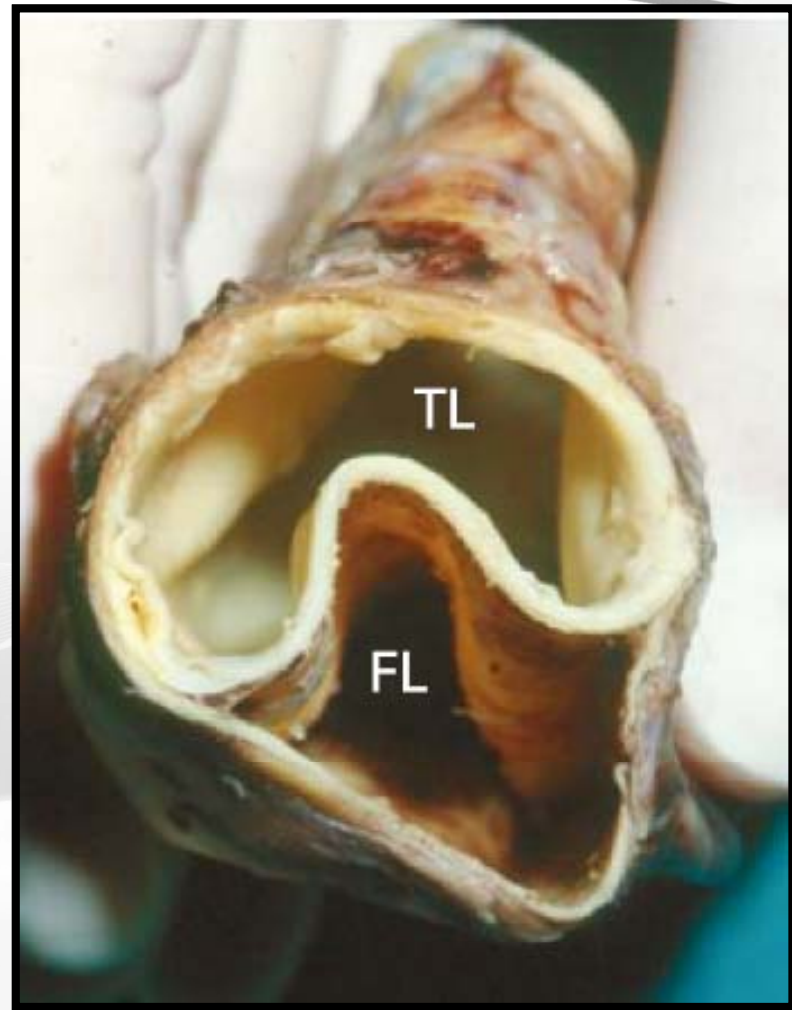


Jae-Kwan Song, MD, PhD, FACC
Asan Medical Center
Seoul, South Korea



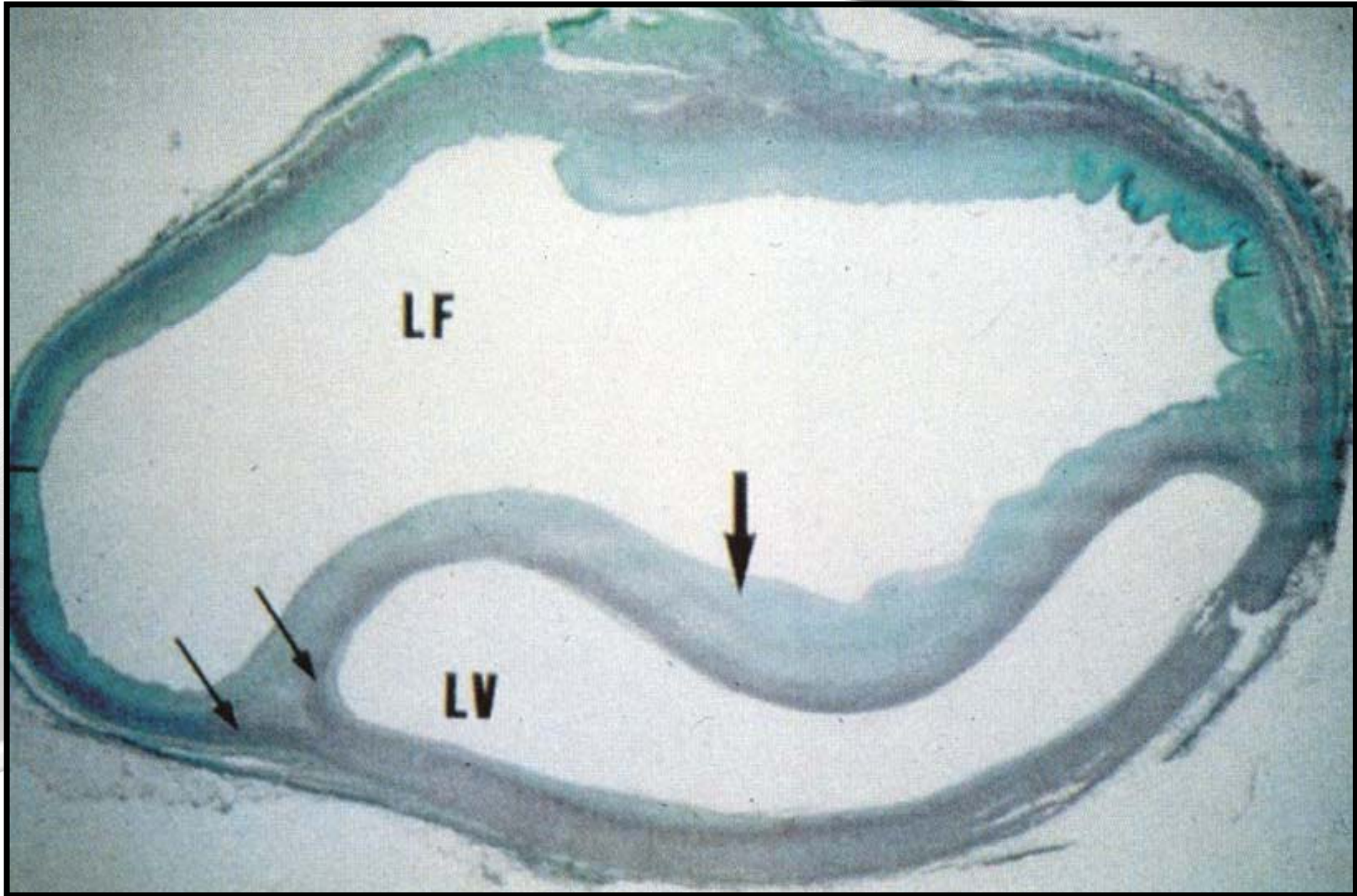
Heart 2001;85:365



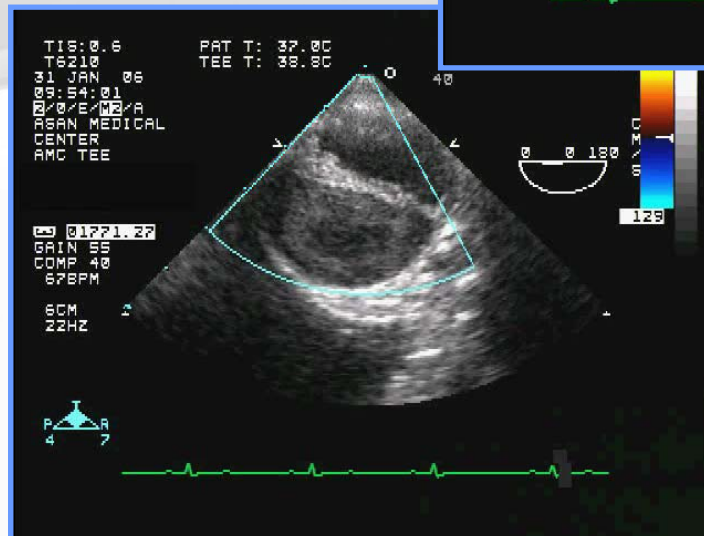
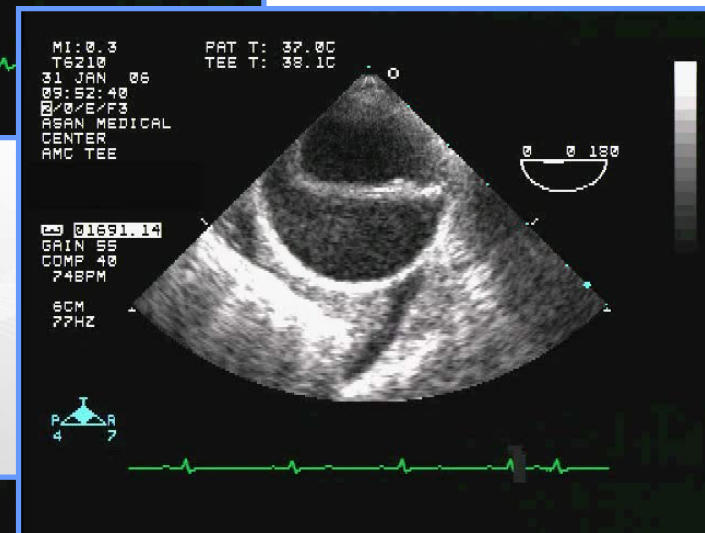
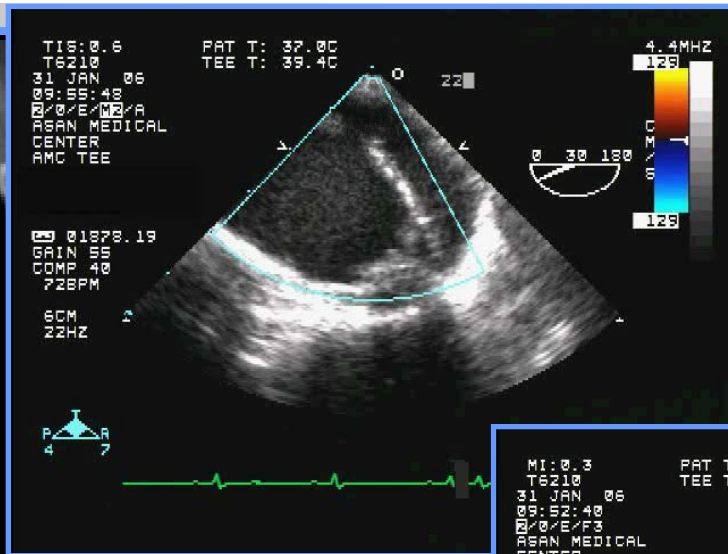
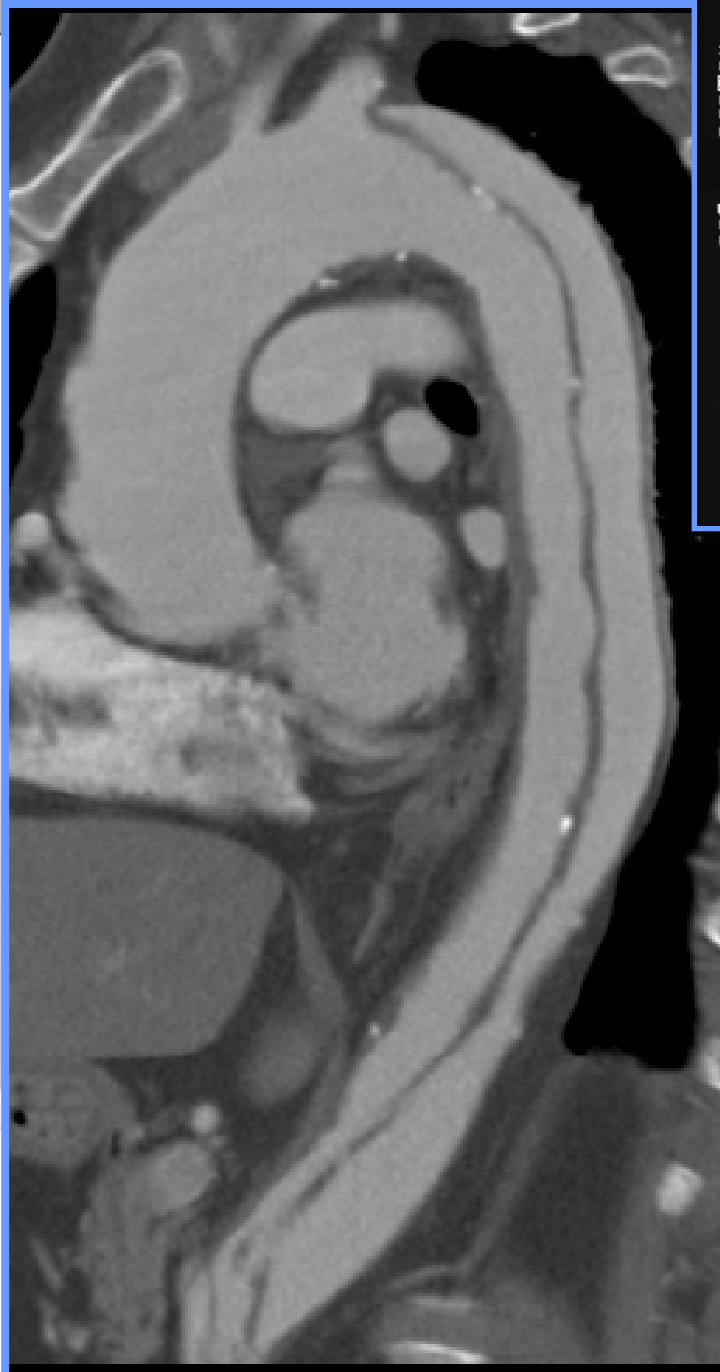


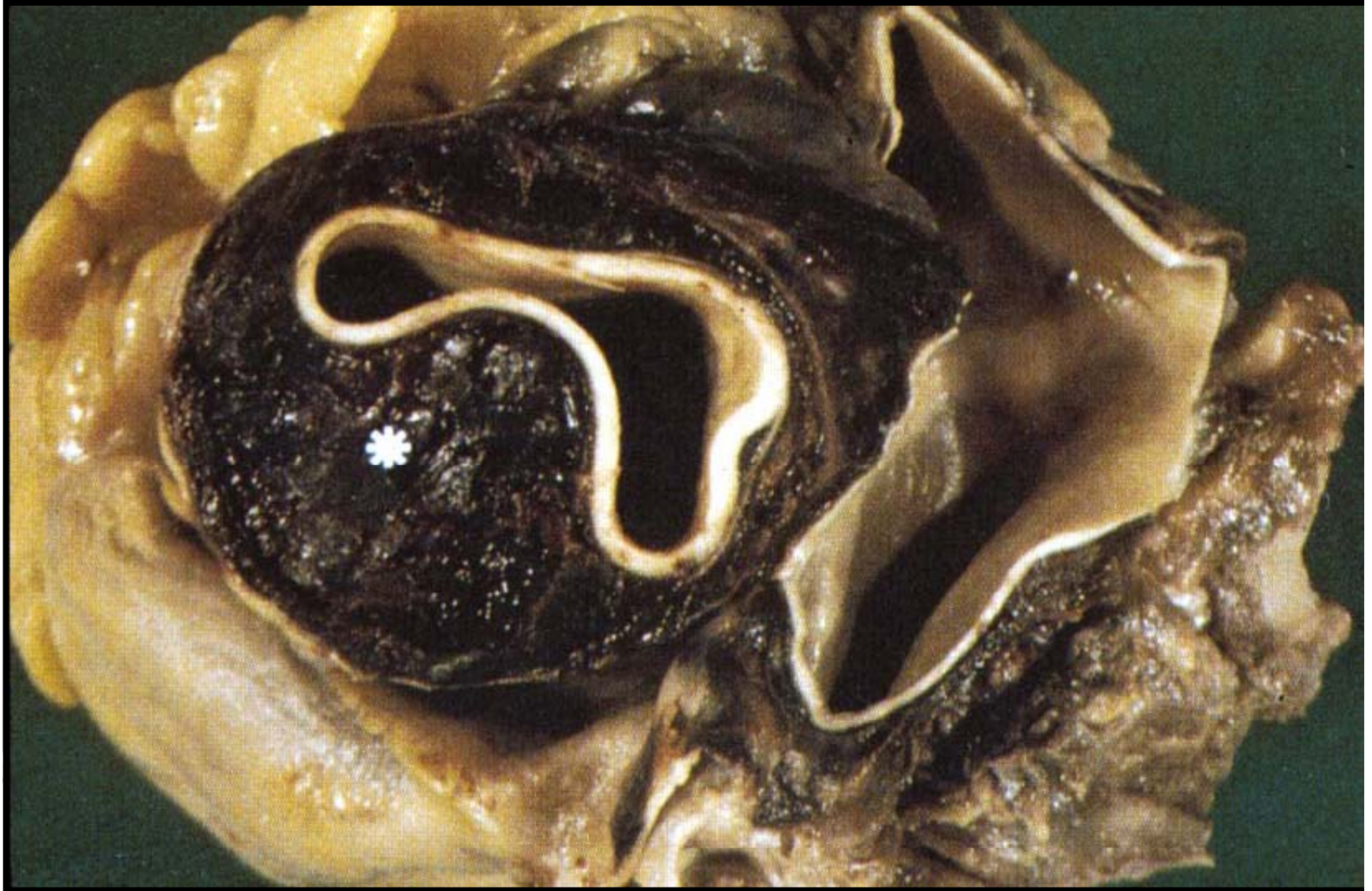
Heart 2001;85:365

Heart 2009;95:1130



Heart 2001;85:365

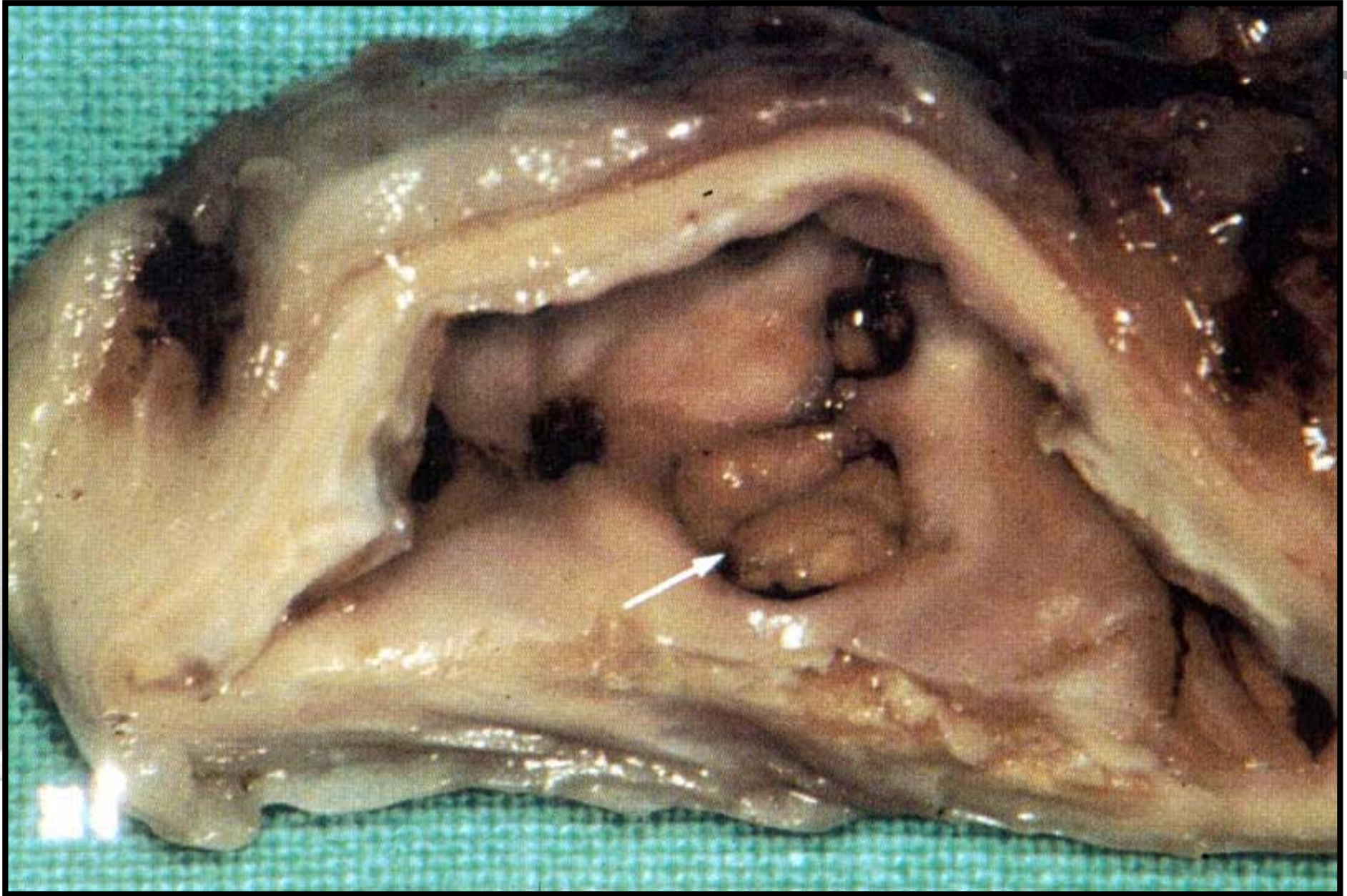




Heart 2001;85:365

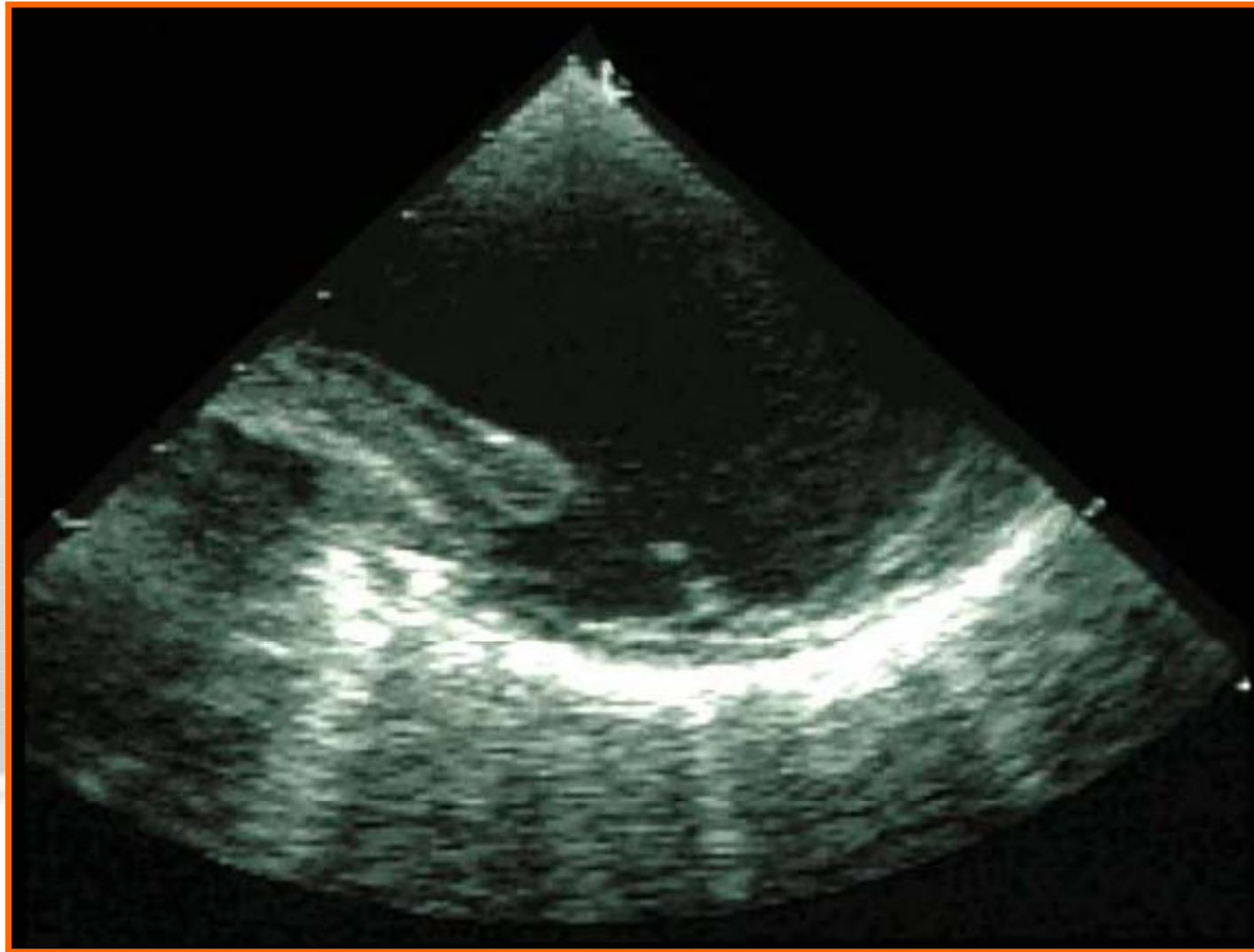


Heart 2001;85:365



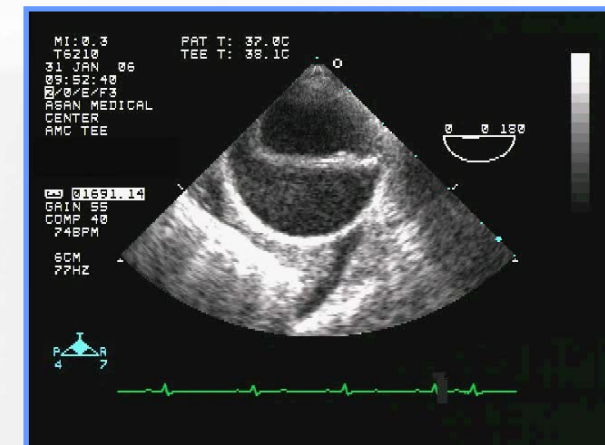
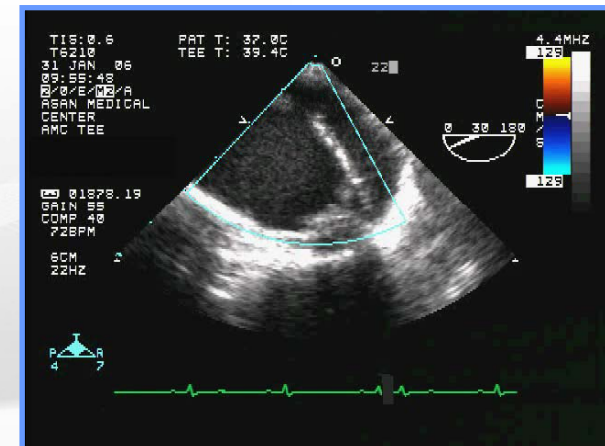
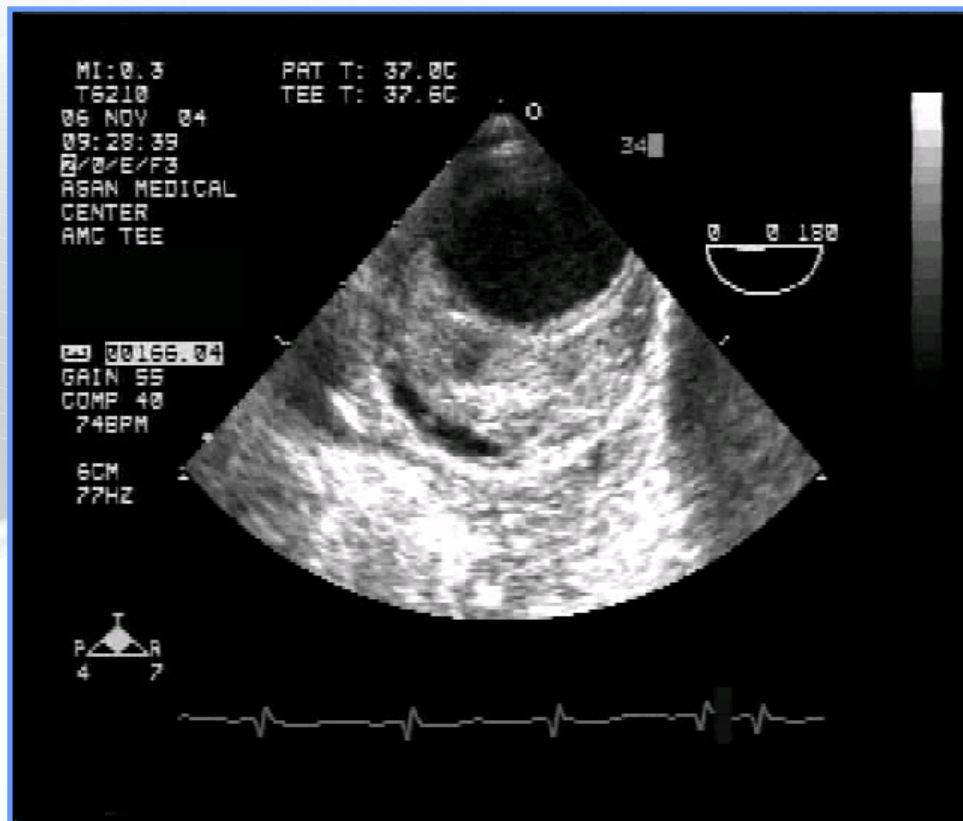
Heart 2001;85:365





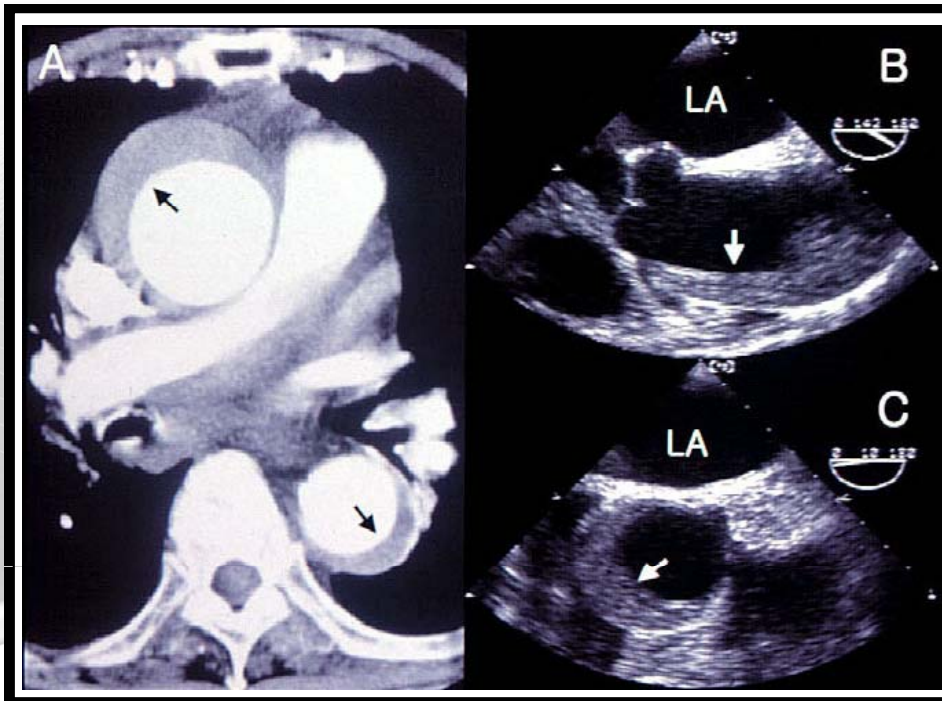
Aortic Intramural Hematoma (IMH)

- Intramedial or subadventitial accumulation of blood without intimal tear or flap

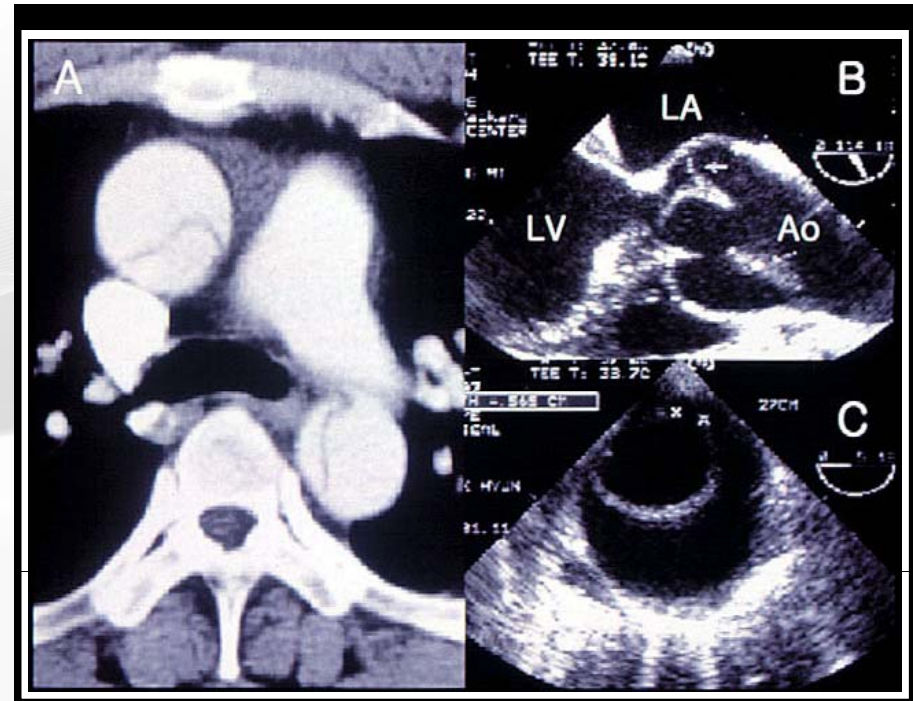


Diagnosis of IMH (1)

- Circular or crescentic aortic wall thickening



IMH



Classic AD

Clinical Features: AD vs. IMH

	IMH(n=260)	AD(n=447)
Age* (y)	64 ± 11	55 ± 14
Male*	124 (48%)	262 (59%)
Hypertension *	172 (66%)	253 (57%)
Bicuspid	3 (1%)	5 (1%)
Prior surgery	3 (1%)	11 (3%)
Marfan's syndrome*	1 (0.4%)	33 (7%)

*p < 0.05

AMC data ('94-'08)

Epidemiology: AD vs. IMH

- Higher prevalence of IMH in the East

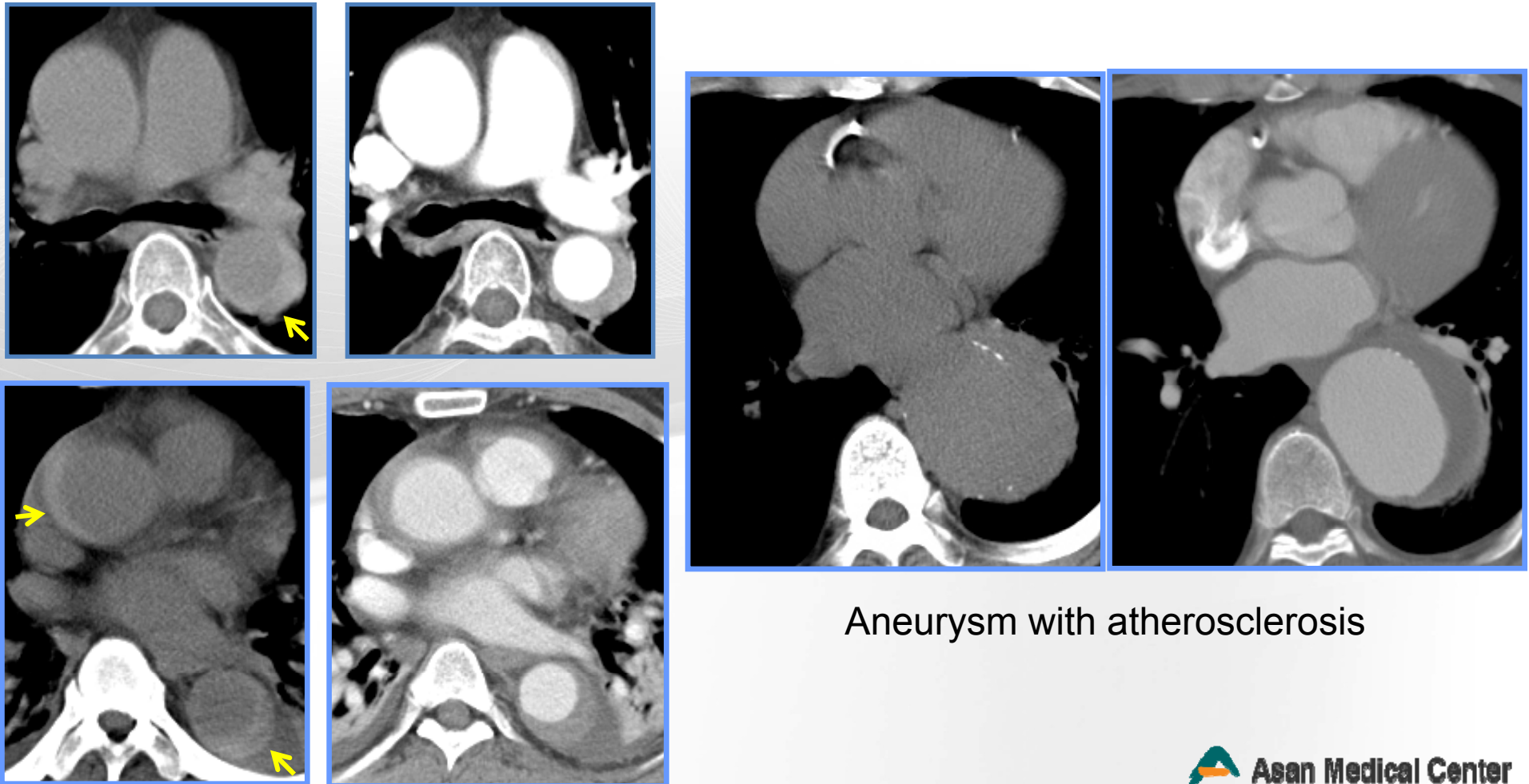
	IRAD	AMC data (94-08)
Type A IMH	8.0%	28.3%
Type B IMH	15.6%	45.4%

- Difference in the affected aorta (AD/IMH)

	IRAD	AMC data (94-08)
Type A	507 / 44	256 / 101
Type B	324 / 60	191 / 159

Diagnosis of IMH (3)

- High attenuation before contrast injection



Diagnosis of IMH (4)



- ‘Echo-free space’ or ‘echo-lucent areas’ within the thickened aortic wall is **characteristic finding of IMH**;
 - prevalence > 60%
 - liquefaction of the hematoma?

Unresolved Issues in Distal IMH

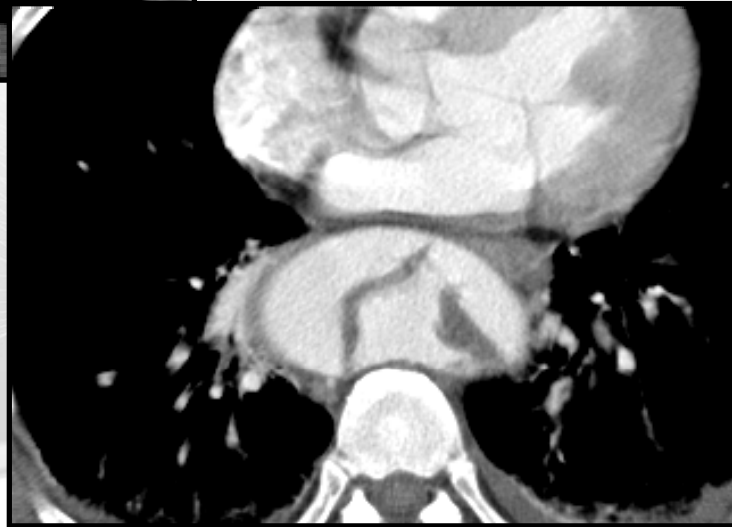
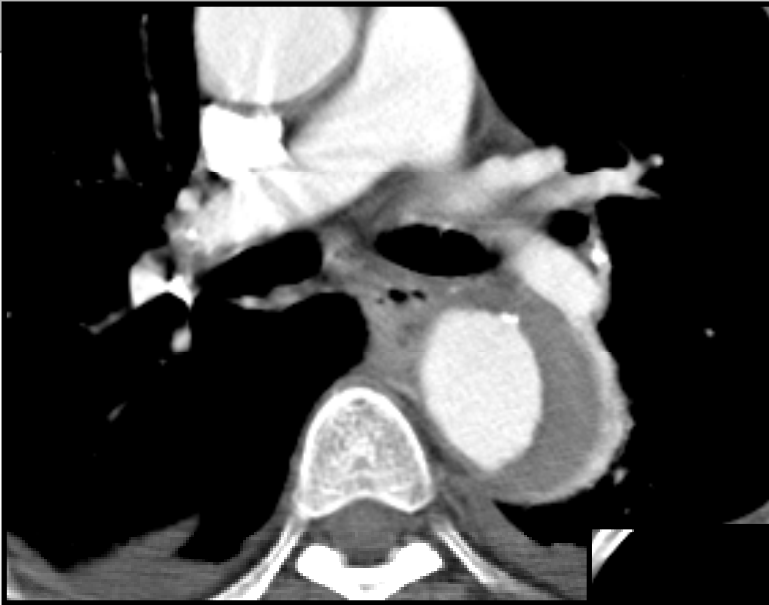
1

Diagnosis based on imaging

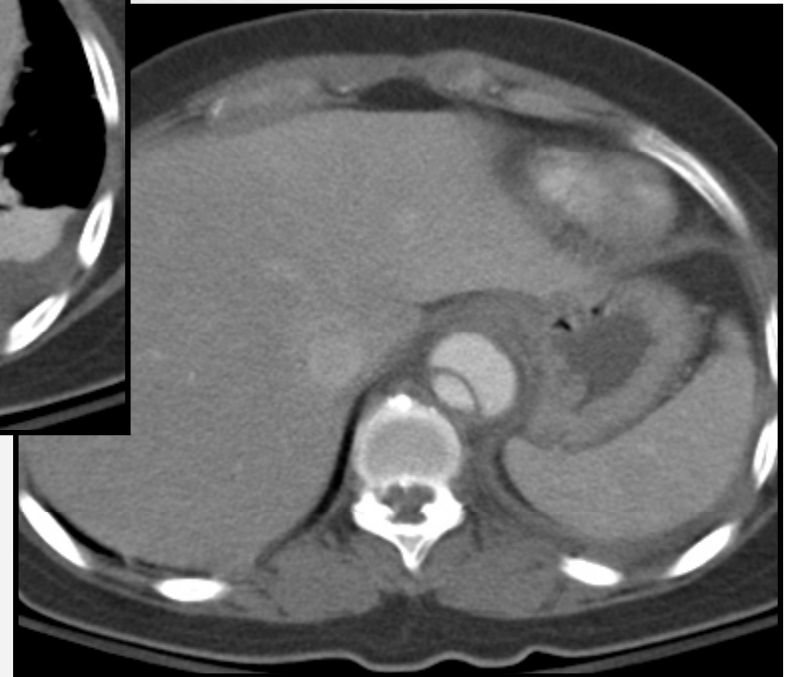
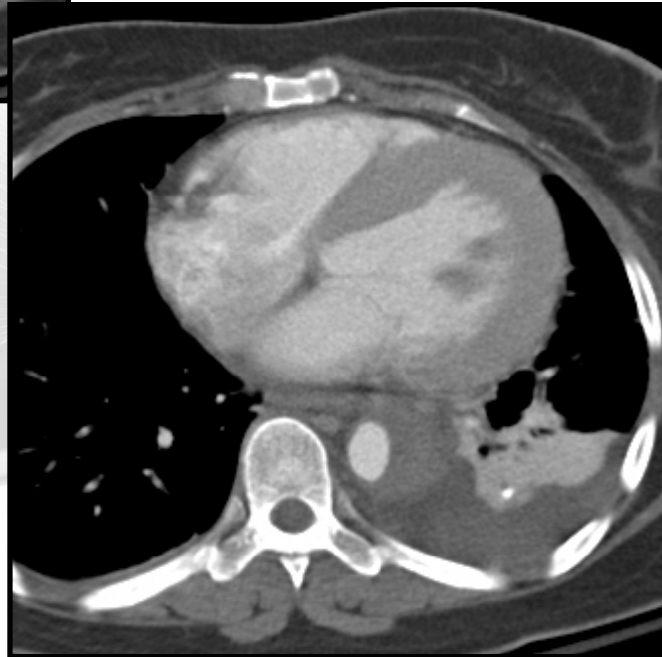
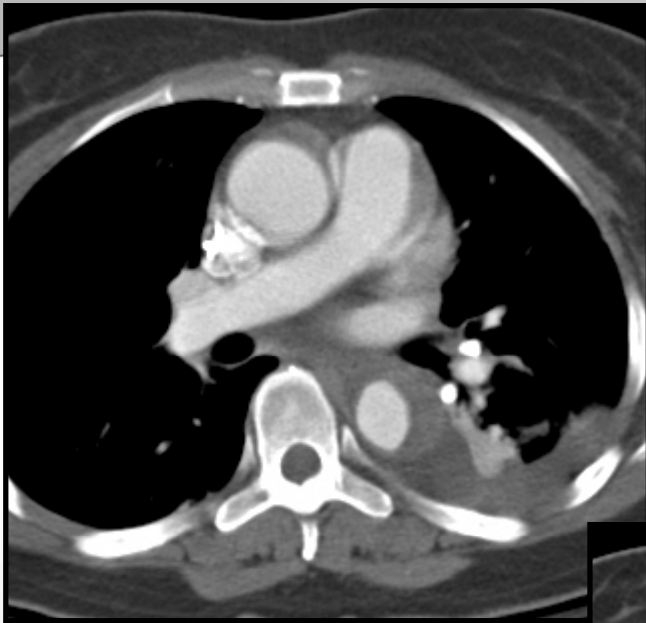
2

Focal contrast enhancement

AD or IMH?

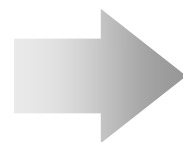


AD or IMH?

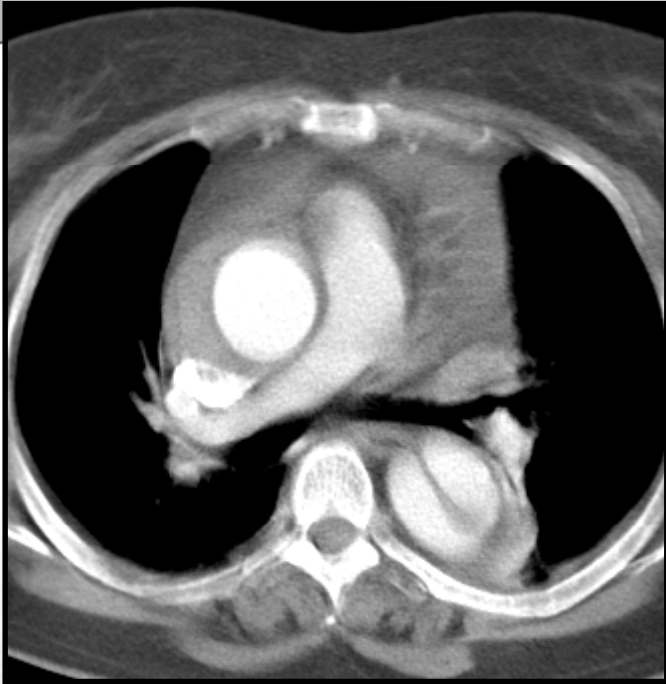




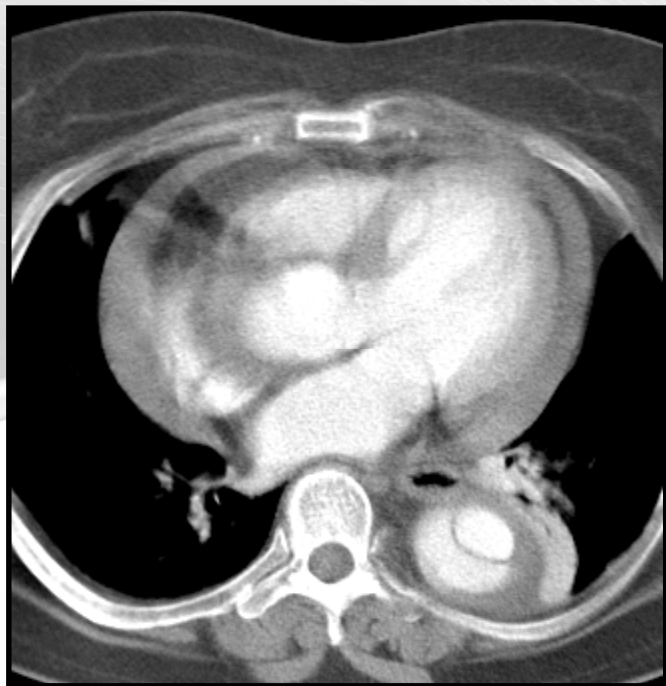
Feb 2006

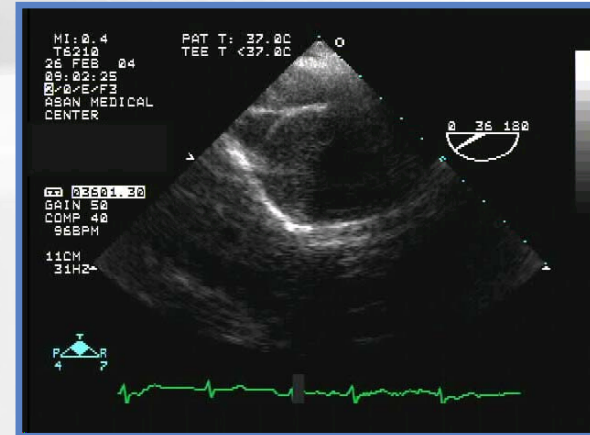
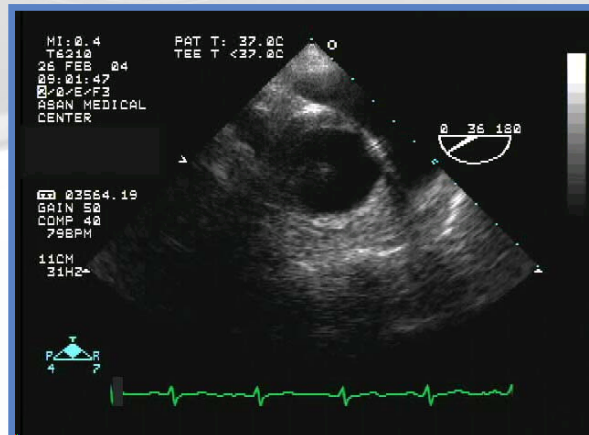
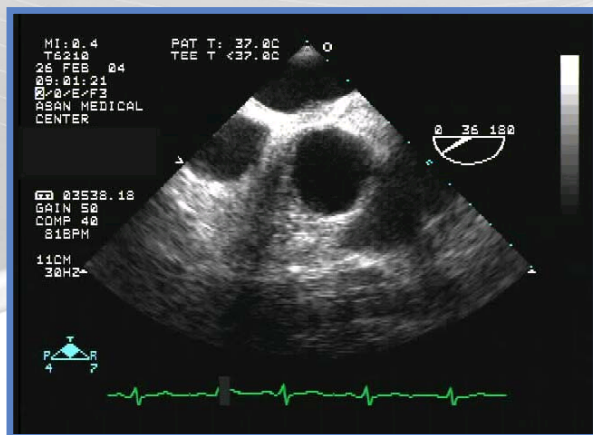
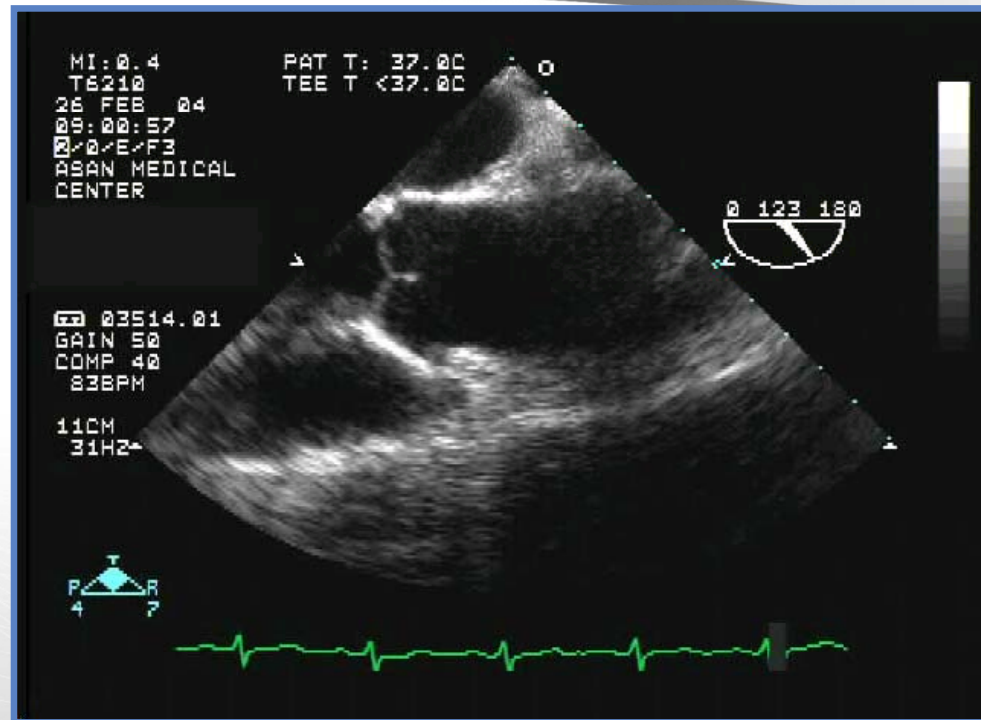


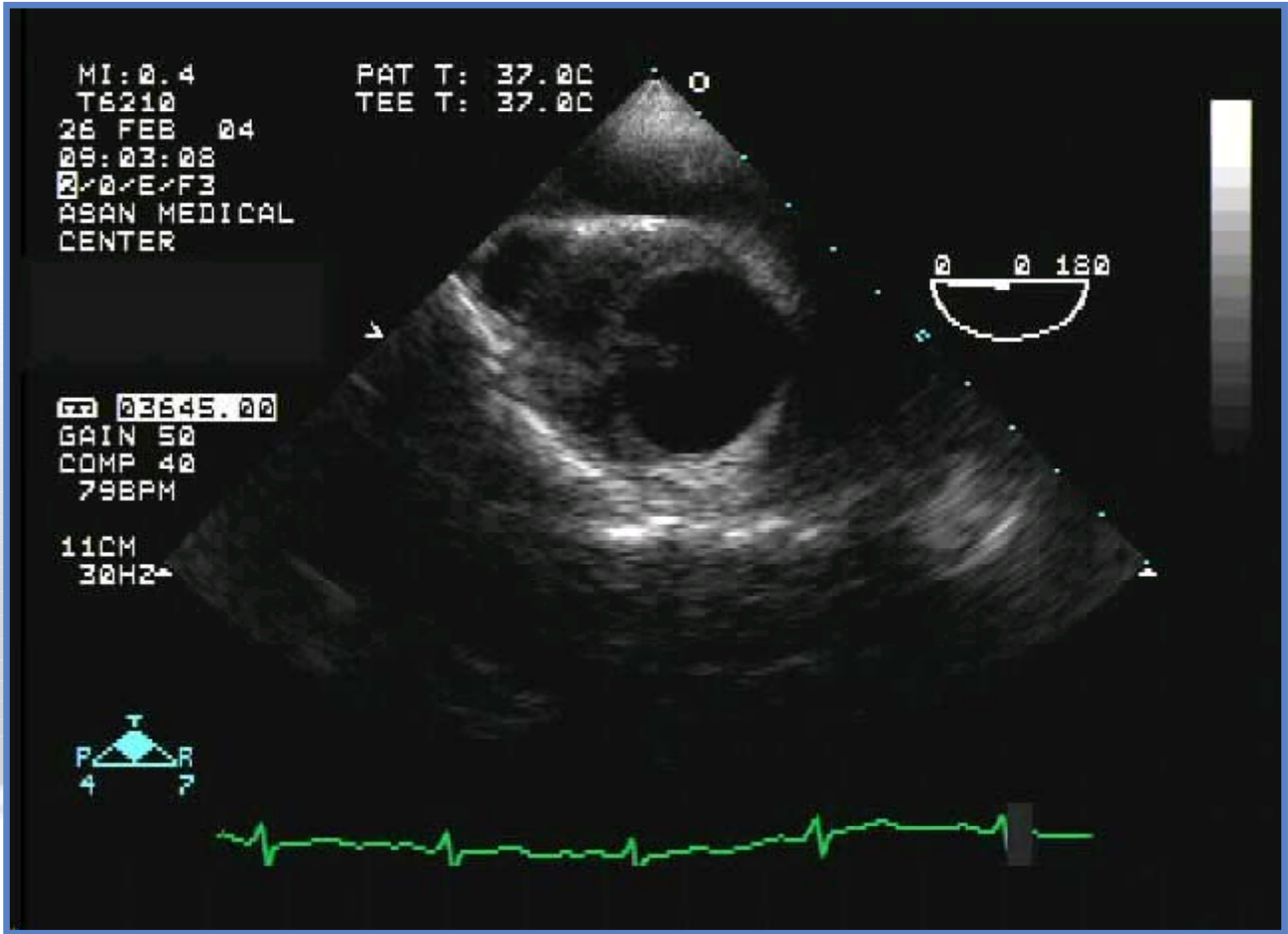
Apr 2006

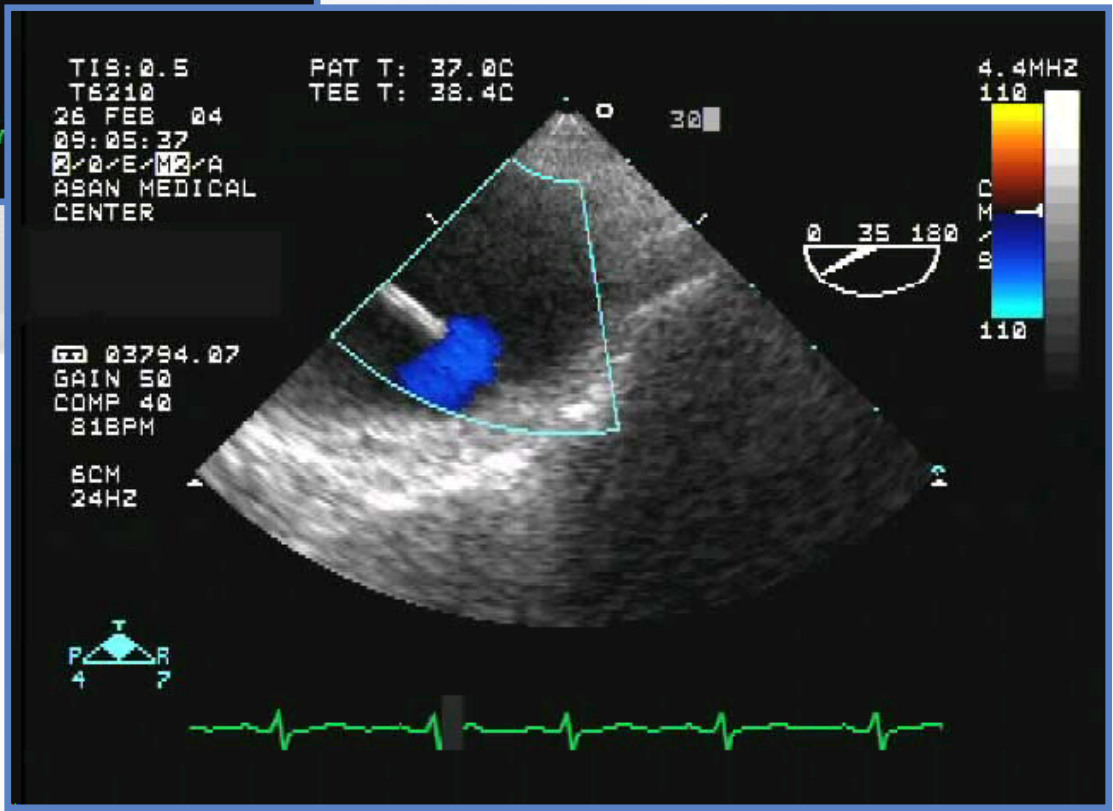
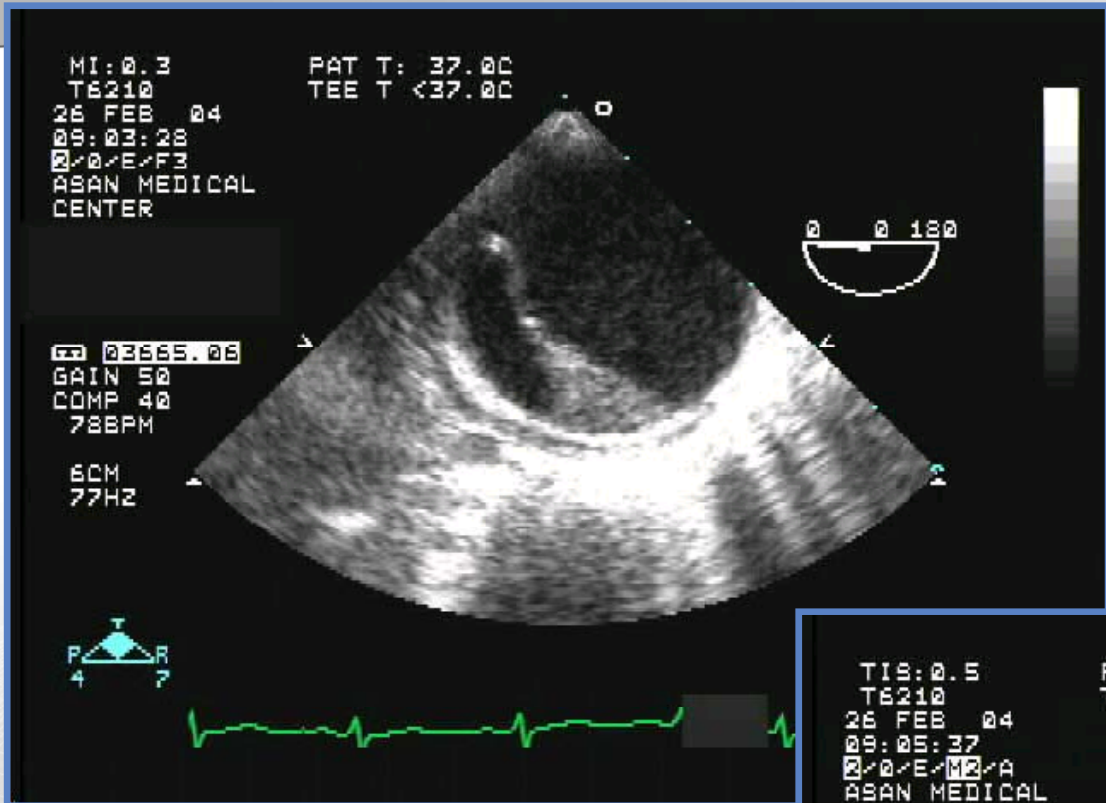


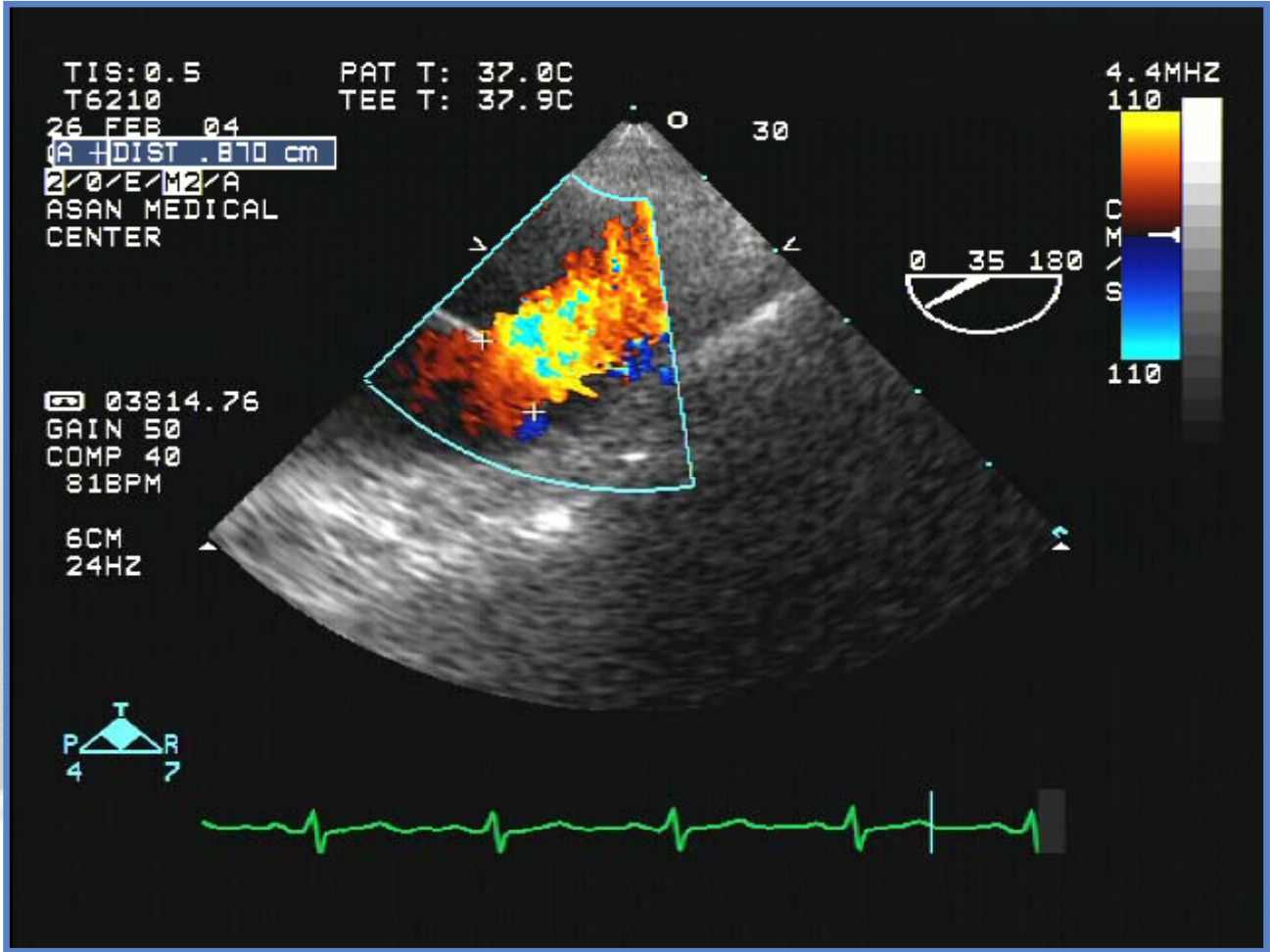
- 1. Type I AD**
- 2. Type I AIH**
- 3. Type I AIH + Type III AD**
- 4. Something else**



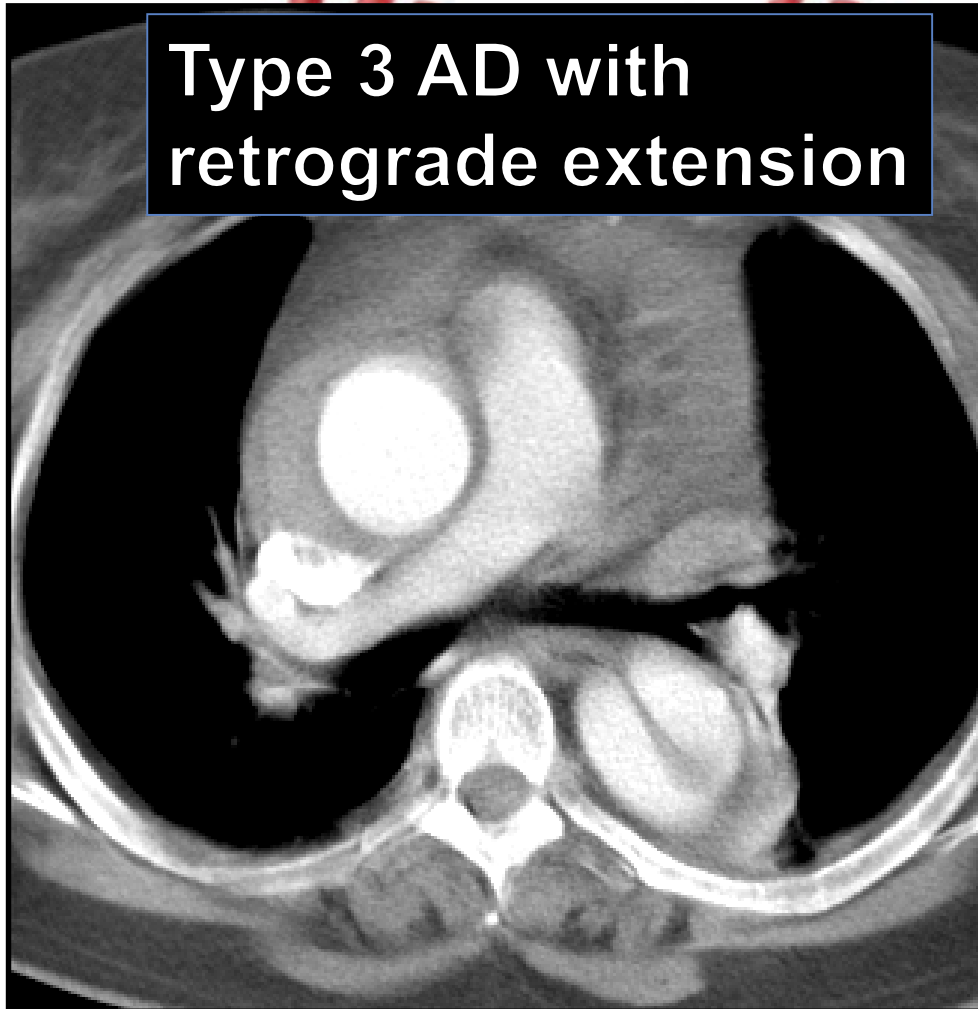








Type A or Proximal



Type 3 AD with retrograde extension

Type I

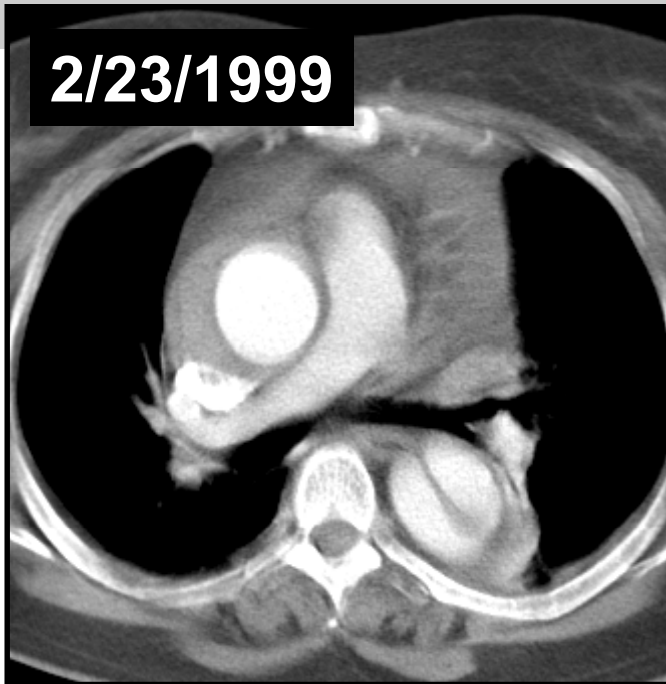
Type II

Type B or Distal

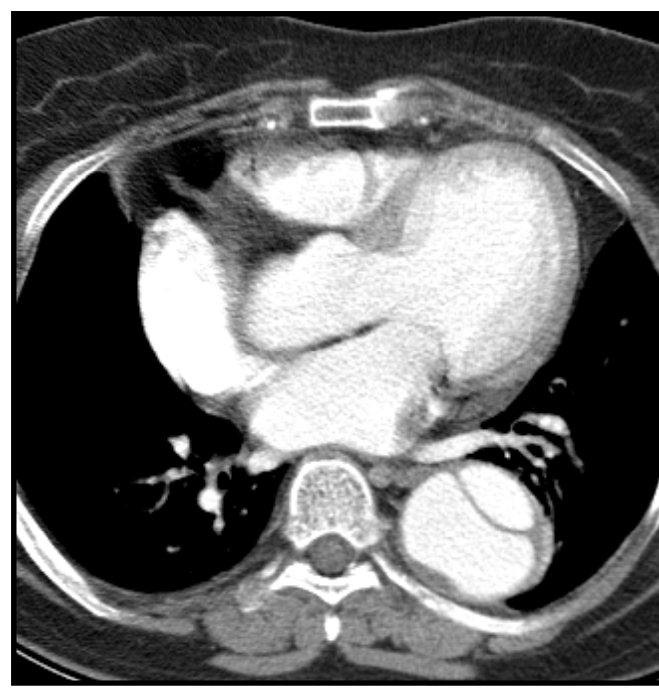
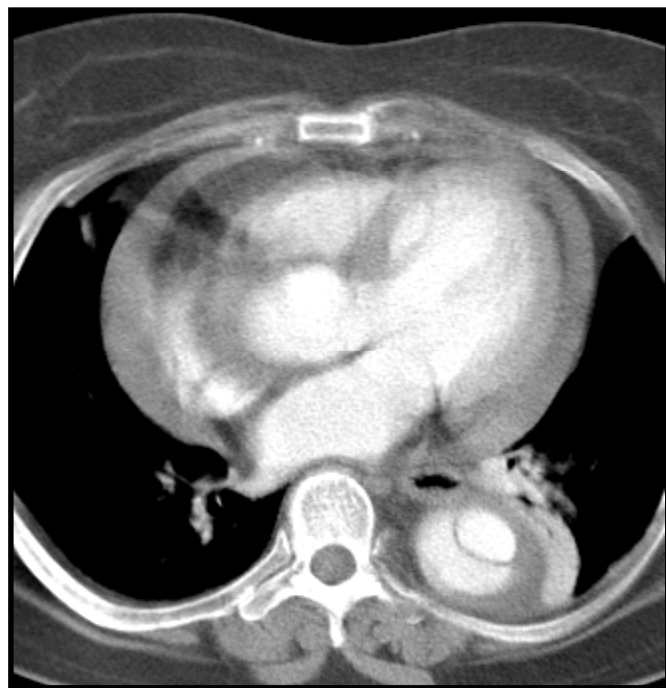
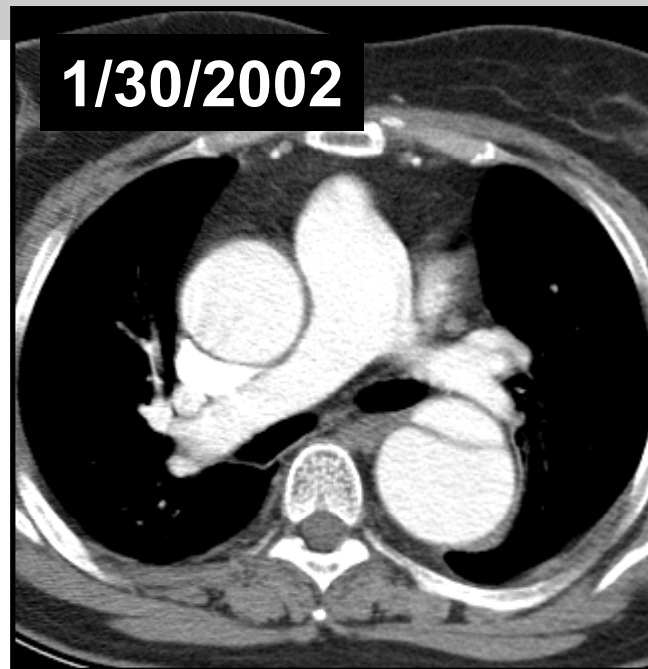


Type III

2/23/1999



1/30/2002



Unresolved Issues in Distal IMH

1

Diagnosis based on imaging

2

Focal contrast enhancement

AD versus IMH (1)

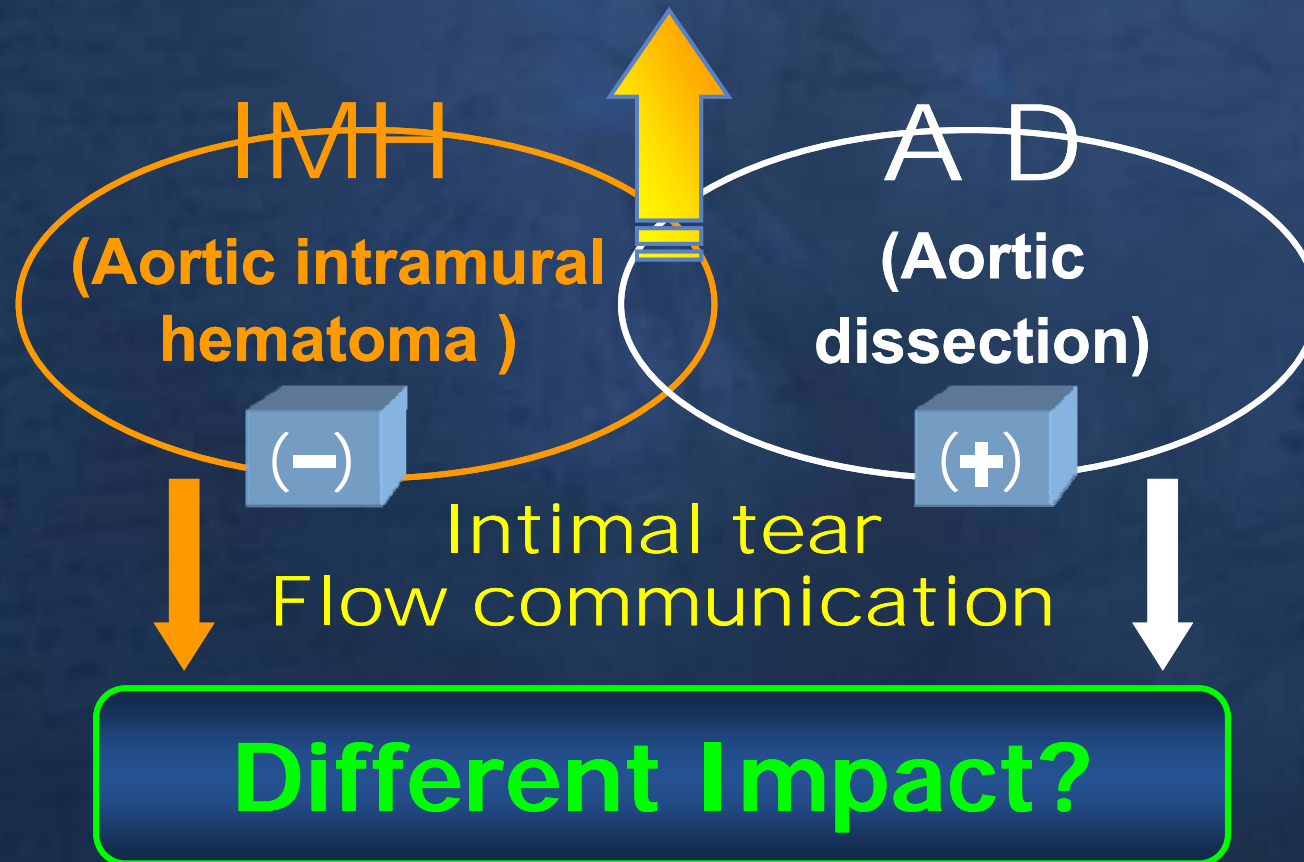
AIH

Aortic Intramural Hematoma

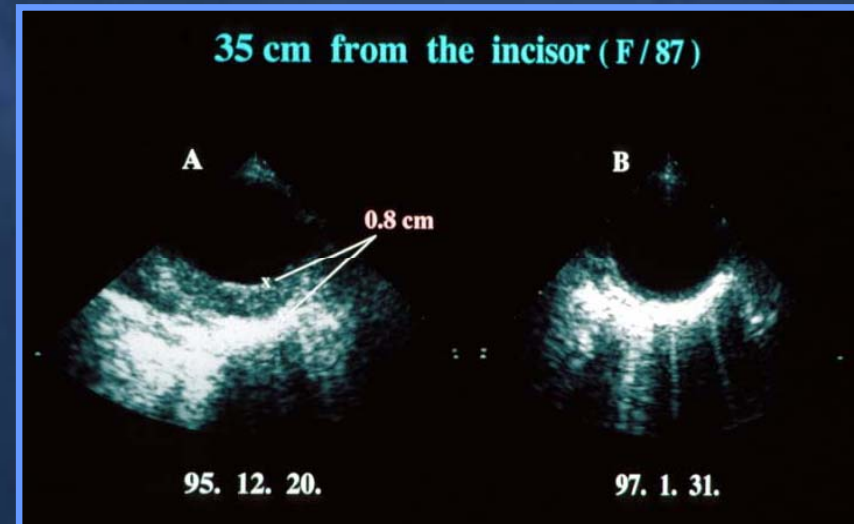
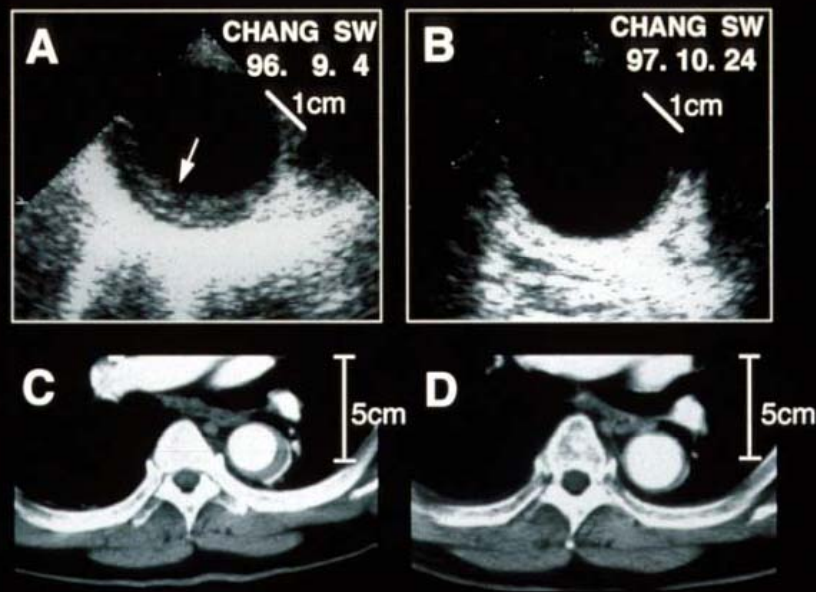
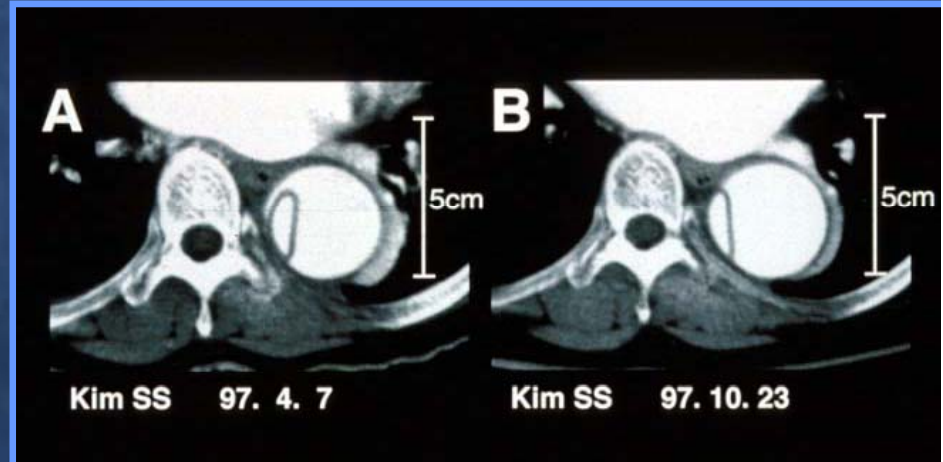
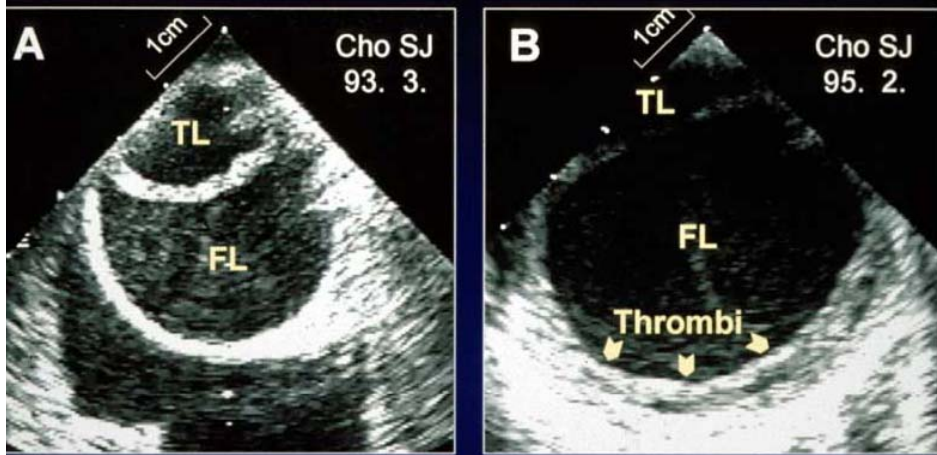
- variant form of aortic dissection (AD)
- absence of intimal tear and typical double - channel aorta
- a precursor or very early stage of AD having higher rate of progression to overt AD?

AD versus IMH (2)

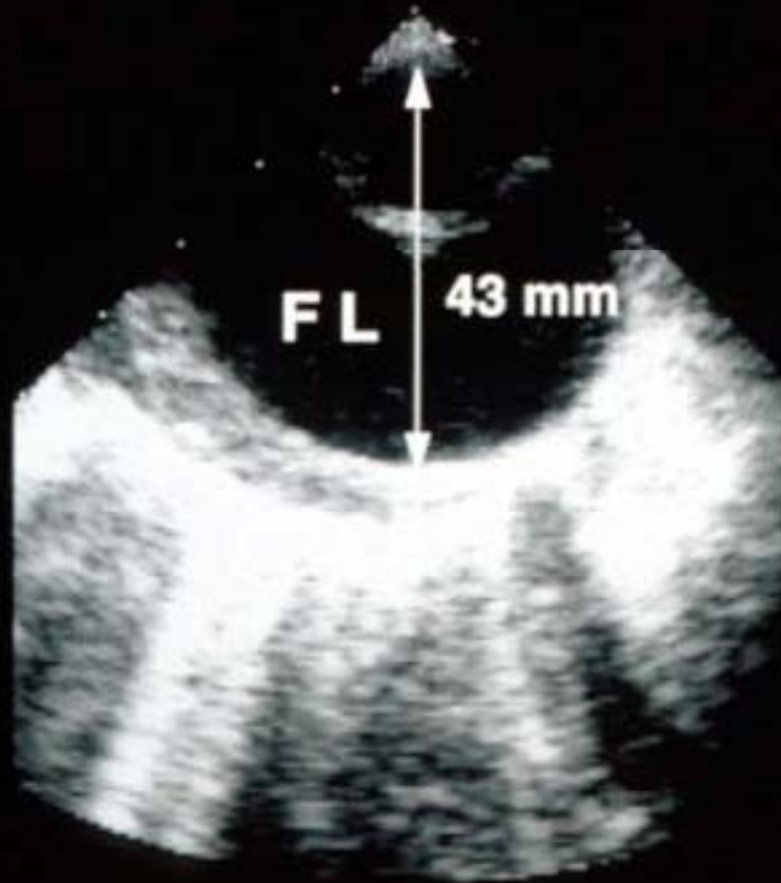
Similar presenting symptom
Same therapeutic modality



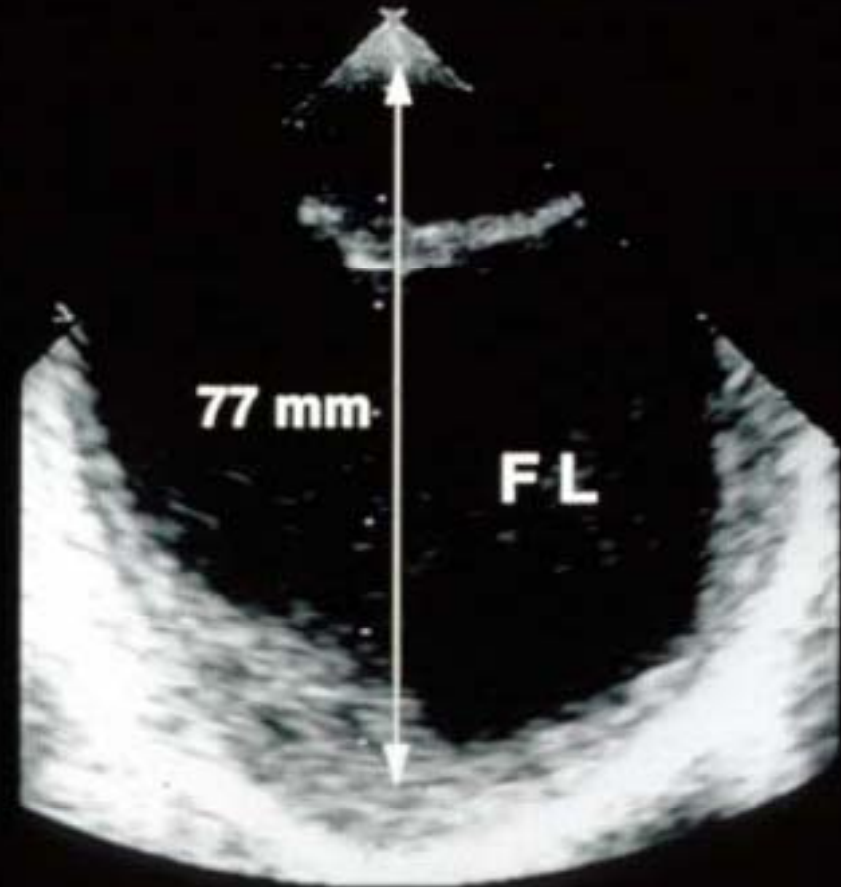
Remodeling Process: AD vs. IMH



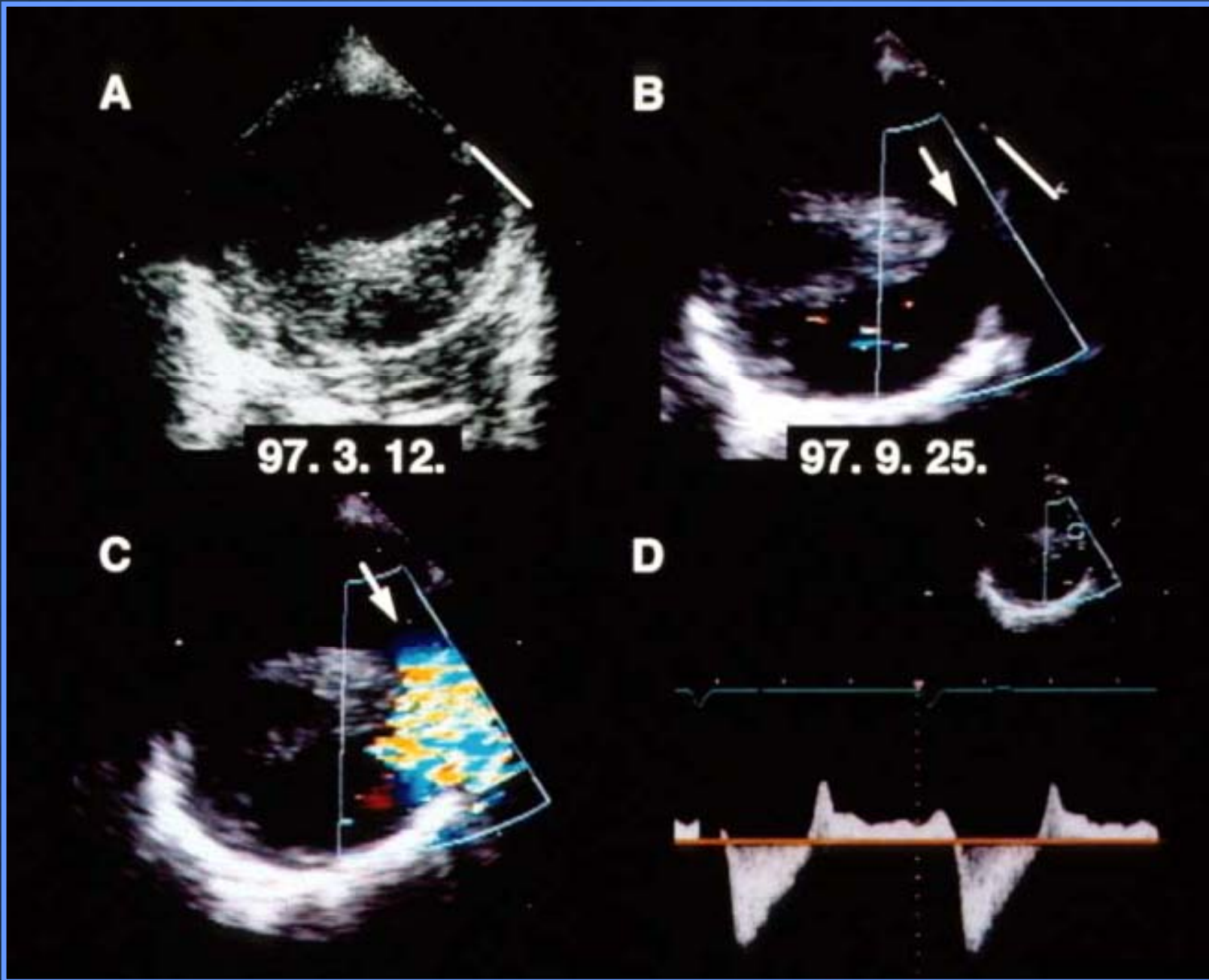
95. 7. 20.

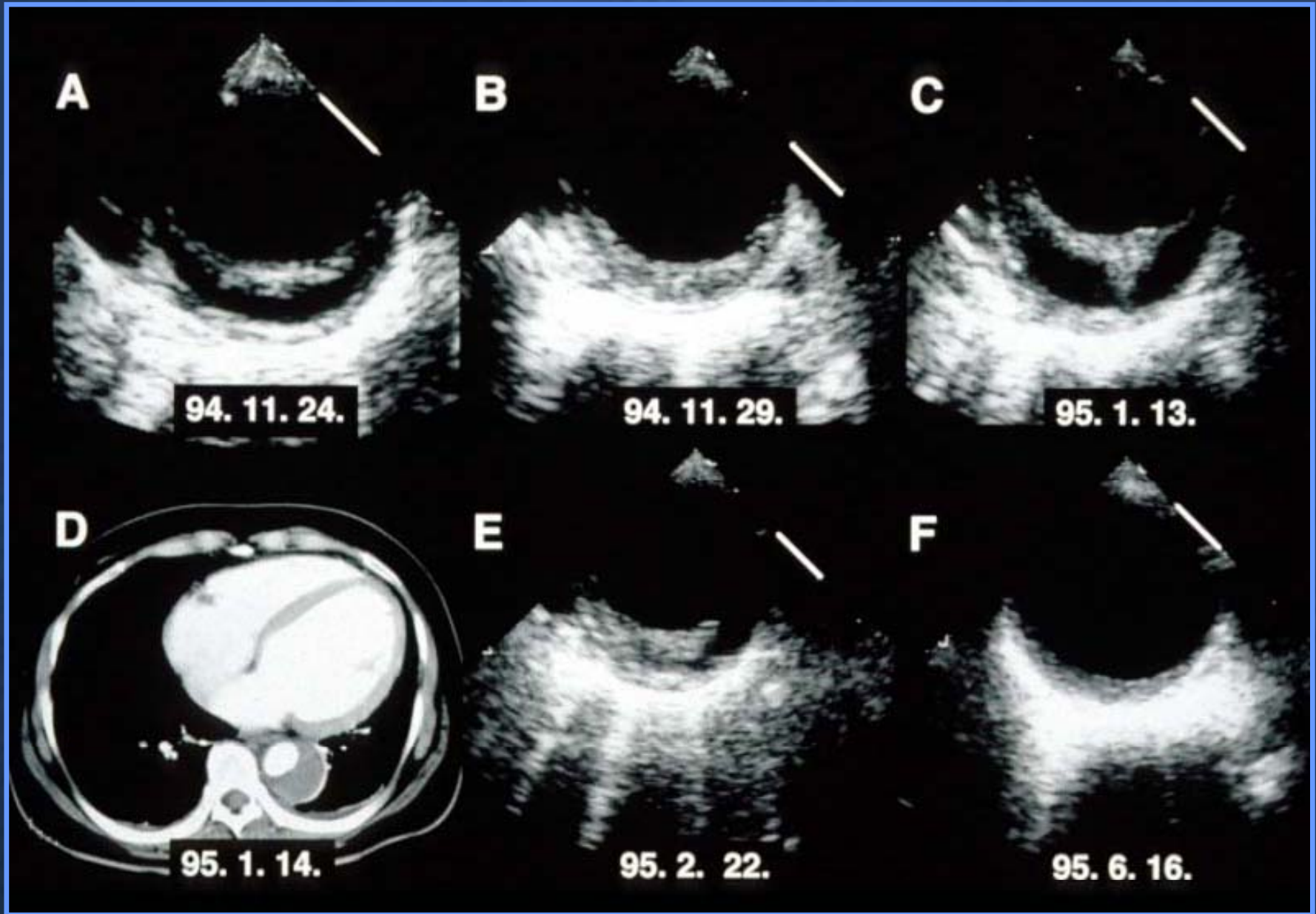


97. 4. 10.



AJC 1999;83:937





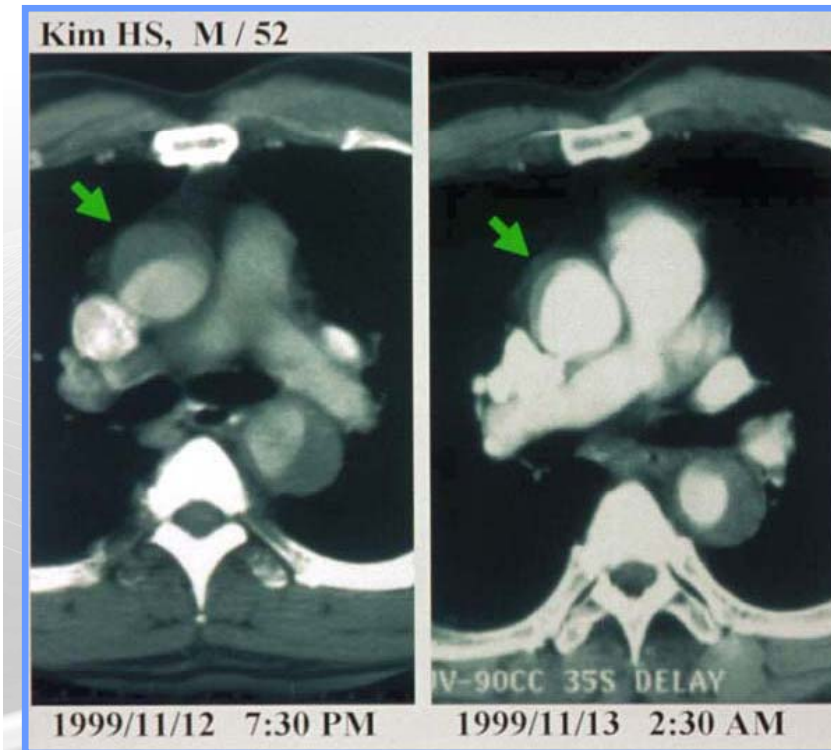
F/U Imaging Study (mean = 9 months)

	IMH	AD
Normalization*	14/20 (70%)	2/25 (8%)
Progression	2 / 20 (10%)	10/25 (40%)
No interval change	4/20 (20%)	13/25 (52%)

* P < 0.01

AJC 1999;83:937

Remodeling or Natural Course of IMH: Variable Evolving Behavior



10 PM, Apr 16th



7 AM, Apr 17th

Fate of IMH with Medical Tx

	Proximal (n=38)	Distal (n=82)
No change	0 (0%)	2 (3%)
Resorption	24 (67%)	54 (78%)
Complete *	16 (44%)	46 (67%) *
Partial	8 (22%)	8 (12%)
Aggravation	3 (8%)	2 (3%)
Development of AD	9 (25%)	11 (16%)
Classic (type I/II/III)	6 (2/3/1)	0
Localized AD	3	11

* P<0.05

Am J Med 2002;113;181



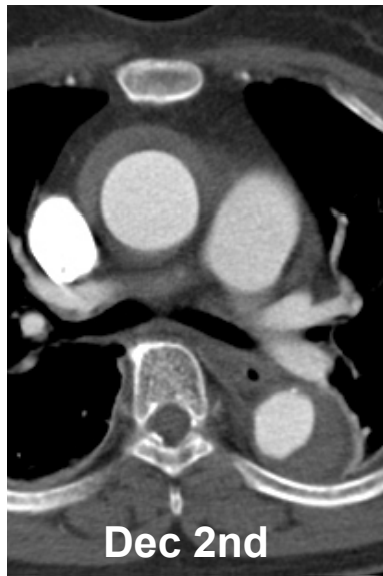
Nov 5th



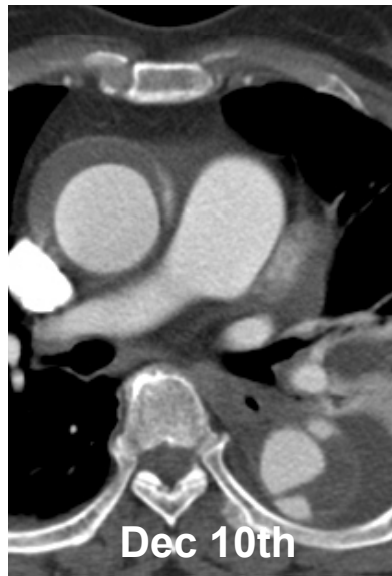
Nov 18th



Dec 26th



Dec 2nd



Dec 10th



Dec 24th

Focal Contrast Enhancement as a Poor Prognosticator?

Prognosis of Aortic Intramural Hematoma with and Without Penetrating Atherosclerotic Ulcer

A Clinical and Radiological Analysis

Circulation 2002;106:342

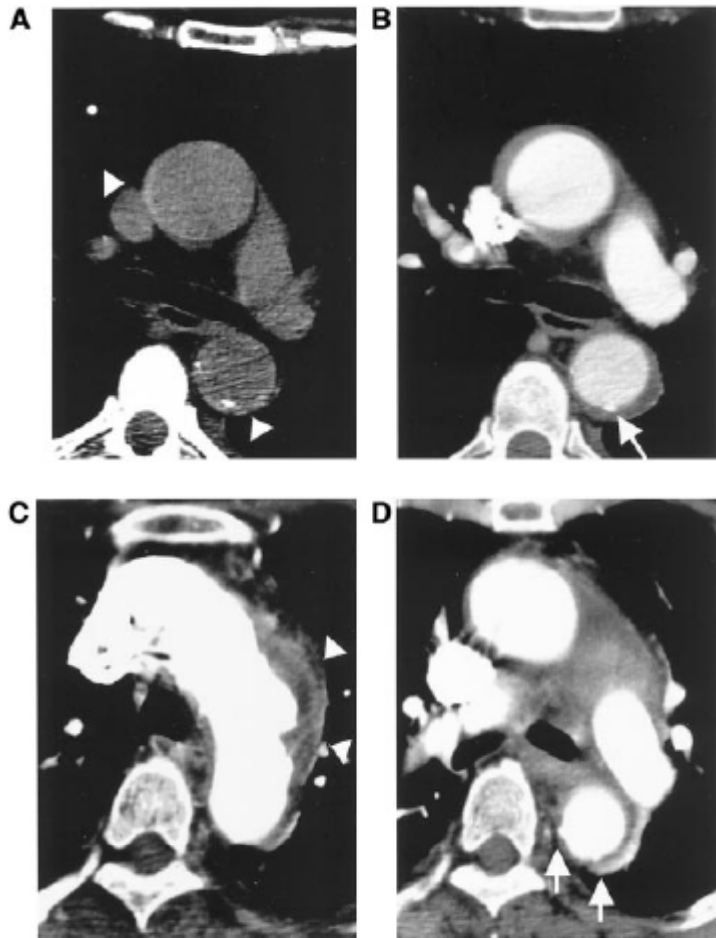


TABLE 4. Disease Course of IMH in Group 1 and 2 Patients

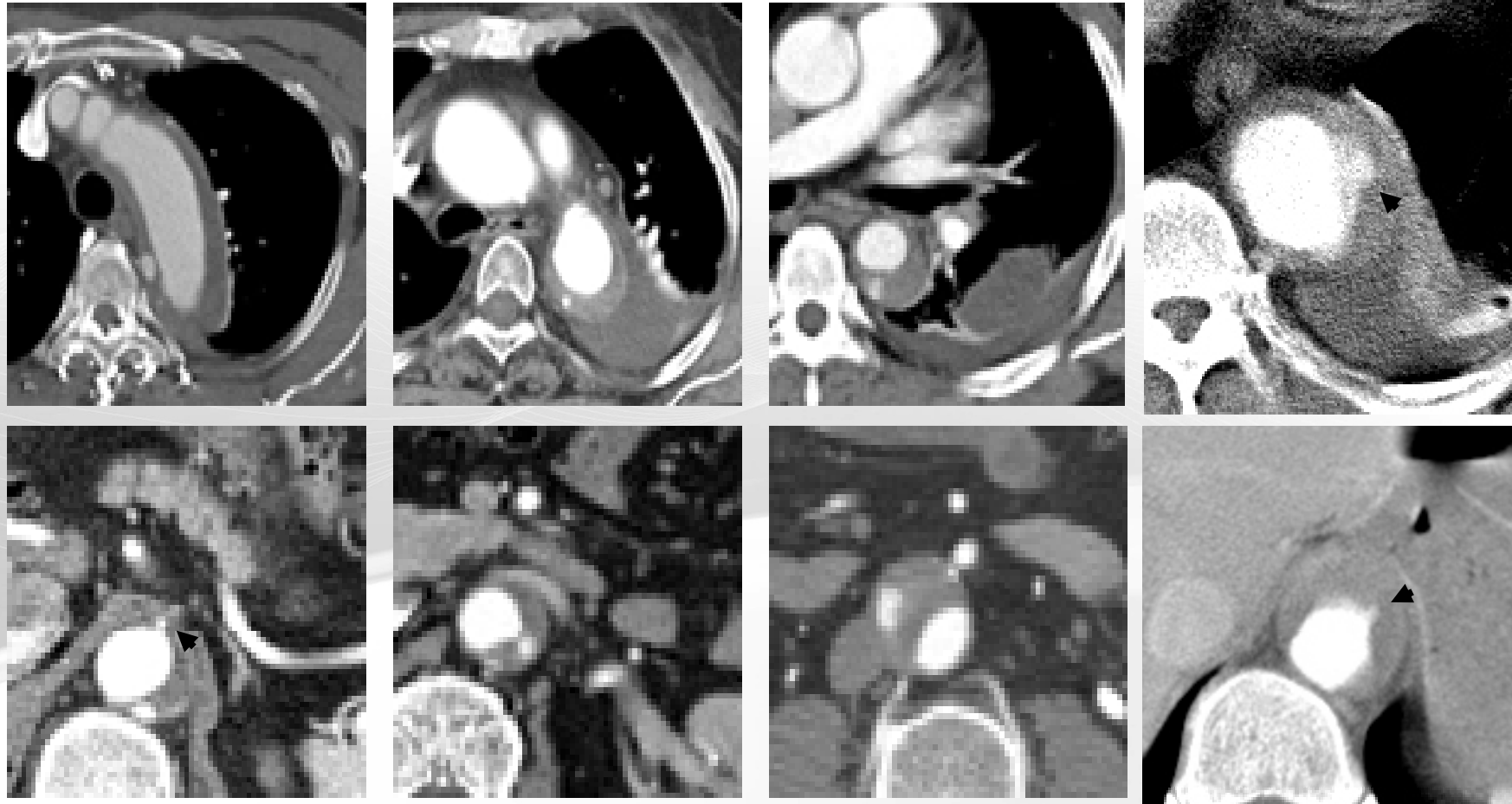
	Group 1 (n=25)	Group 2 (n=24)	<i>P</i>
Stable course	13	22	0.002
No change	11	20	
Regression	2	2	
Progressive course	12	2	
Aortic rupture	4	1	
IMH expansion	5	0	
Propagation to double-barreled dissection	3	1	

Early Aggressive Medical Treatment Associated with Selective Prophylactic Aortic Stent-Grafting for Aortic Intramural Hematoma



Thorac Cardiovasc Surg 2011;59:342

Focal Contrast Enhancement in Distal IMH



Radiology 2011;259:100

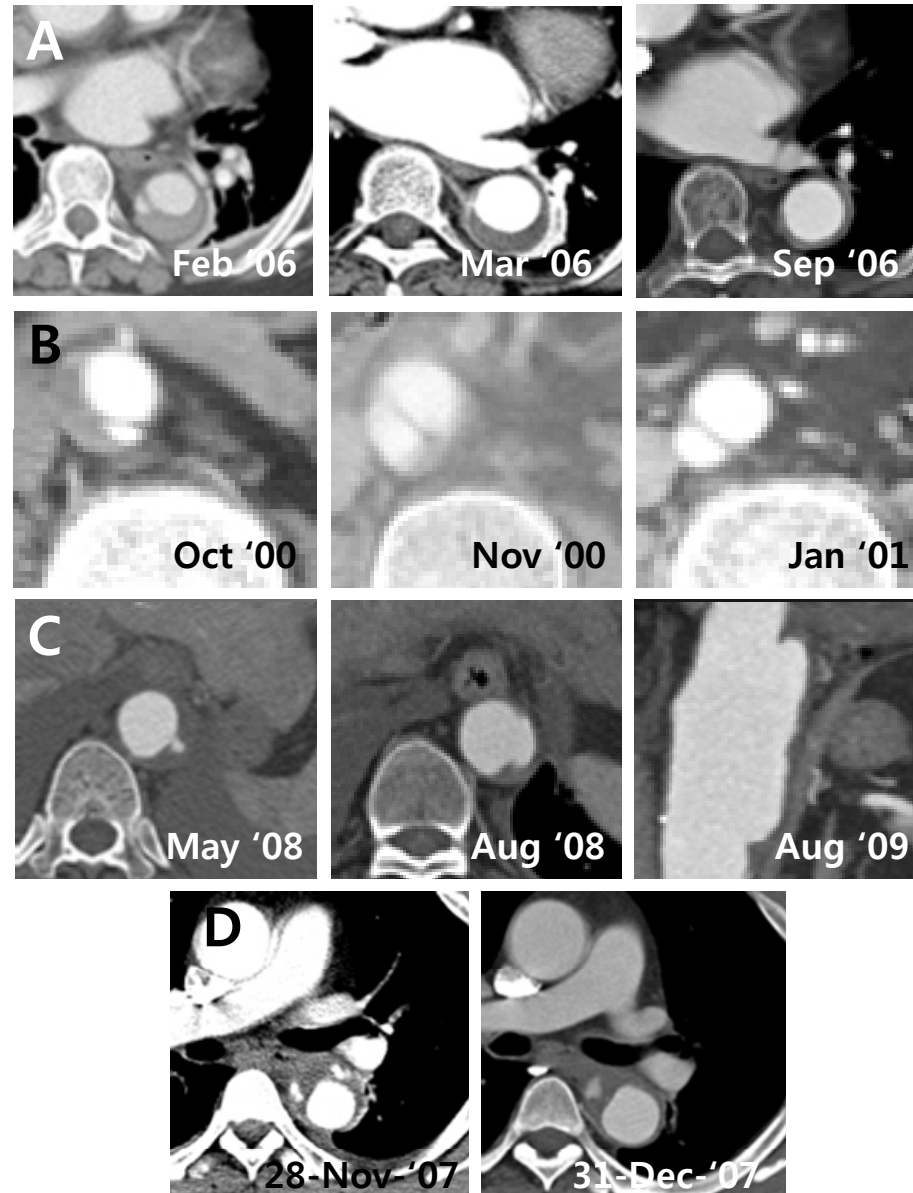
Distal Aortic Intramural Hematoma:

Clinical Importance of Focal Contrast Enhancement on CT Images

Radiology 2011;259:100

- 147 consecutive pts with distal IMH bet Jan 1994 and Oct 2008
- Review of both initial and follow-up CT images:
 - no initial images (n=27)
 - no follow-up image (n=13)
- Thus the remaining 107 patients were the subjects of the study:
 - 1) Incidence of FCE
 - 2) Risk factors associated with FCE
 - 3) Impact of FCE on remodeling process
 - 4) Any prognostic role?

	FCE (+) (n=42)	FCE (-) (n=65)	P-value
Age	62.0±11.1	63.9±11.2	0.386
Creatinine >1.4 mg%	24%	22%	0.816
Pleural effusion	41%	43%	0.79
Limb or visceral ischemia	2%	2%	0.99
Pericardial effusion	7%	5%	0.677
Maximal aortic diameter, mm	38.2±4.5	39.0±6.9	0.53
Maximal hematoma thickness, mm	12.3±3.6	10.1±4.1	0.006



Radiology 2011;259:100

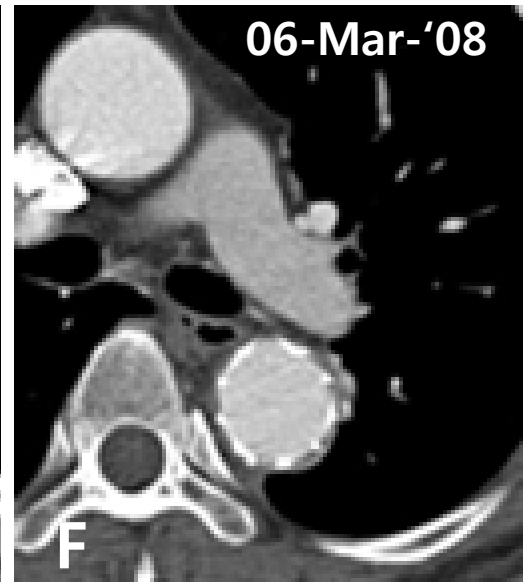
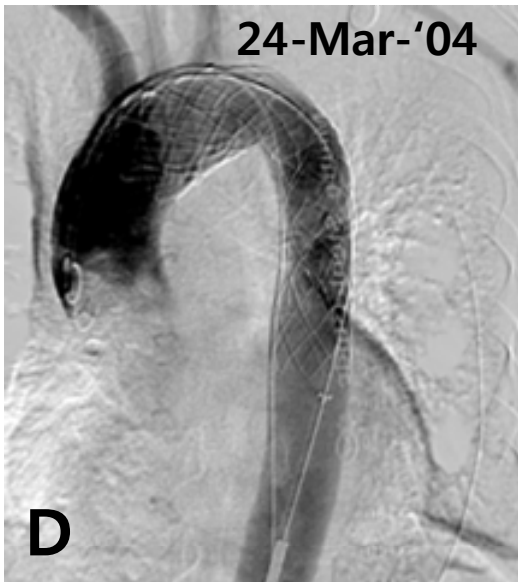
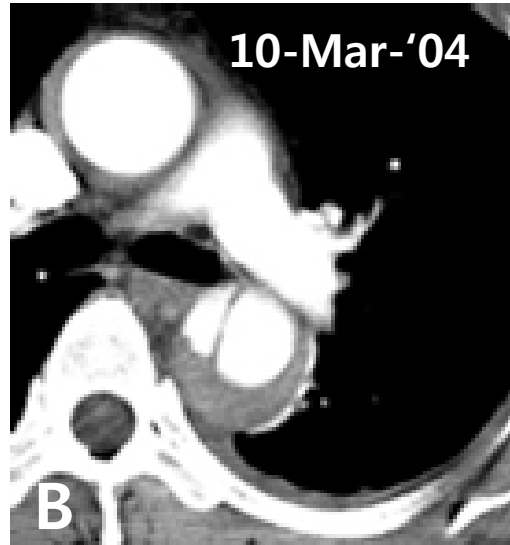
Fate of Distal IMH

	Total	FCE (+ (n=42)	FCE (- (n=65)	<i>P</i>
Resorption	70 (65.4%)	24 (57%)	46 (71%)	0.148
Aortic dissection	11 (10.3%)	9 (21%)	2 (3%)	0.006
Saccular aneurysm	16 (15.0%)	7 (17%)	9 (14%)	0.690
Increase of hematoma	3 (2.8%)	0 (0%)	3 (5%)	0.278
No interval change	7 (6.5%)	2 (5%)	5 (8%)	0.702

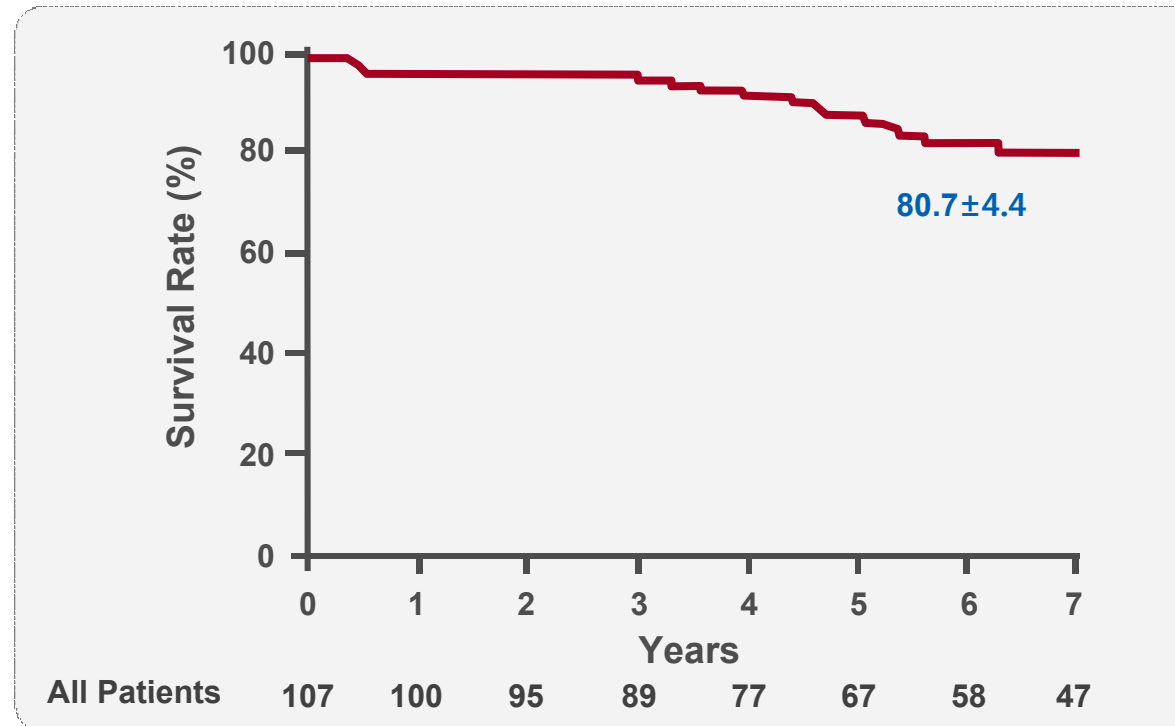
Hospital Course of Distal IMH

	Total	FCE (+) (n=42)	FCE (-) (n=65)	<i>P</i>
Surgery	3	1	2	0.99
Endovascular intervention	4	2	2	0.645
Hospital mortality	1	0	1	0.99

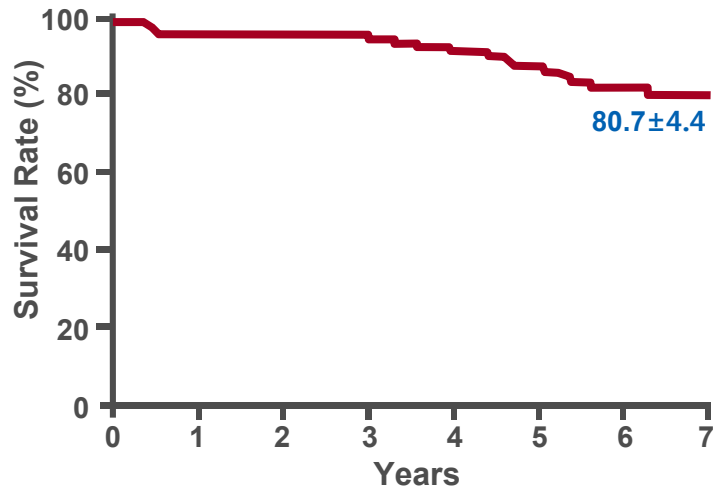
- FCE (+) group:
 - endovascular stent in 2 pts (AD/saccular aneurysm)
 - surgery for saccular aneurysm
- FCE (-) group:
 - endovascular stent for saccular aneurysm in 2 pts
 - surgery for saccular aneurysm in 2 pts
 - mortality: 1 pt who refused surgery after aortic rupture



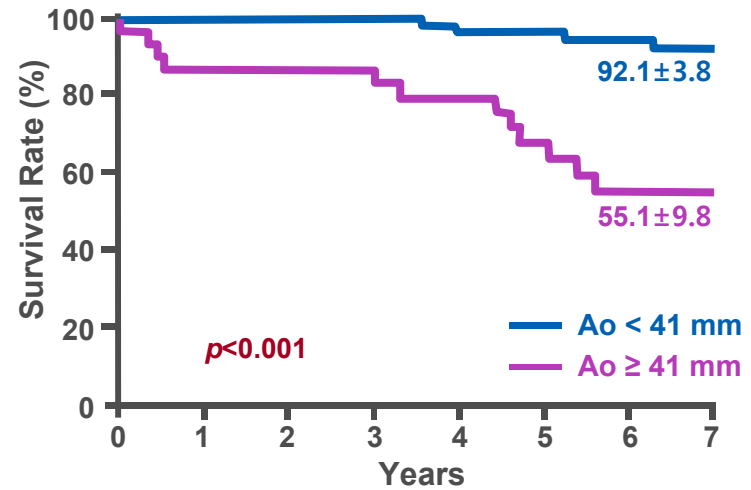
Follow-up of Distal IMH



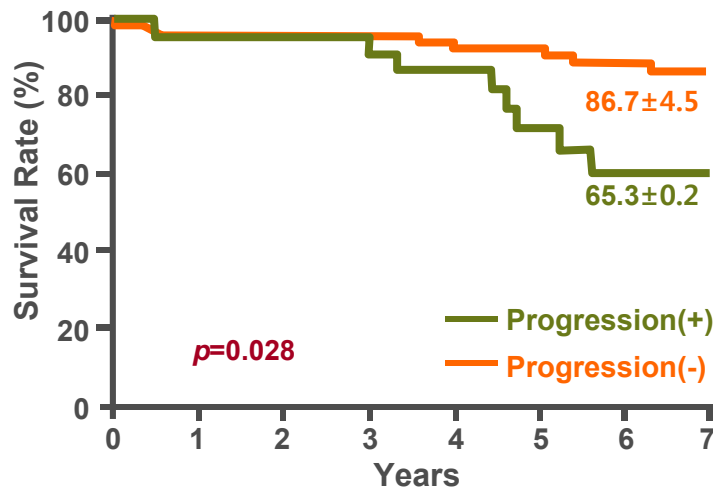
- 17 pts died during F/U:
 - acute myocardial infarction (n=2), malignancy (n=2),
during aortic surgery for aneurysmal change (n=1),
during surgery for AAA and aortic regurgitation (n=2),
respiratory failure (n=2),
sudden death (aneurysm [n=4]/normalization of aorta [n=4])



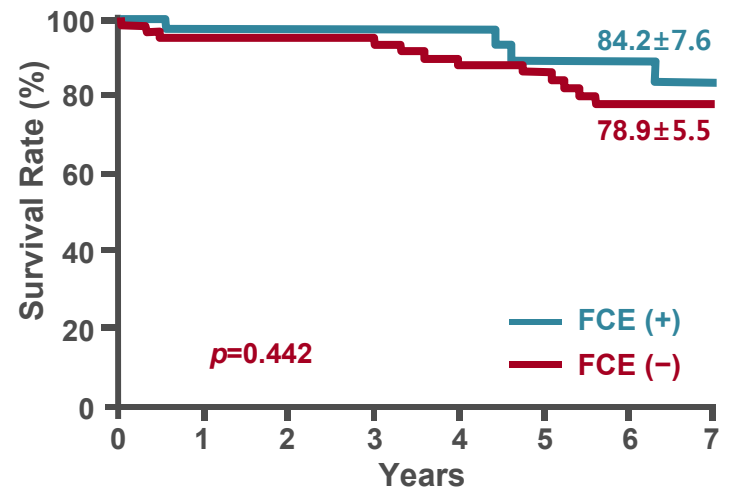
All pts	107	100	95	89	77	67	58	47
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Ao ≥ 41	30	25	25	25	20	16	13	11
Ao < 41	77	57	57	57	55	50	44	35

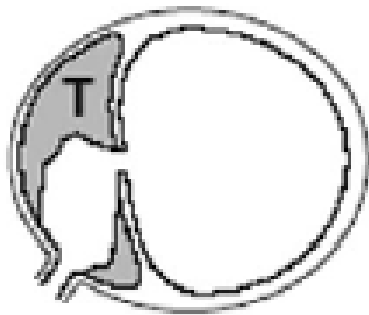


Progression(+)	30	23	23	21	19	14	11	10
Progression(-)	77	74	67	64	56	51	46	36

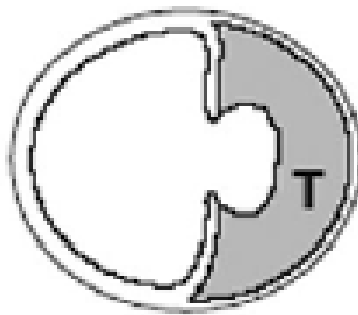


FCE(+)	42	37	34	30	25	22	19	14
FCE(-)	65	59	57	55	50	43	38	32

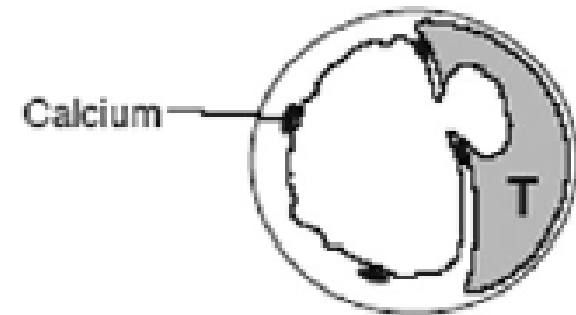
Pathologic Correlates of FCE



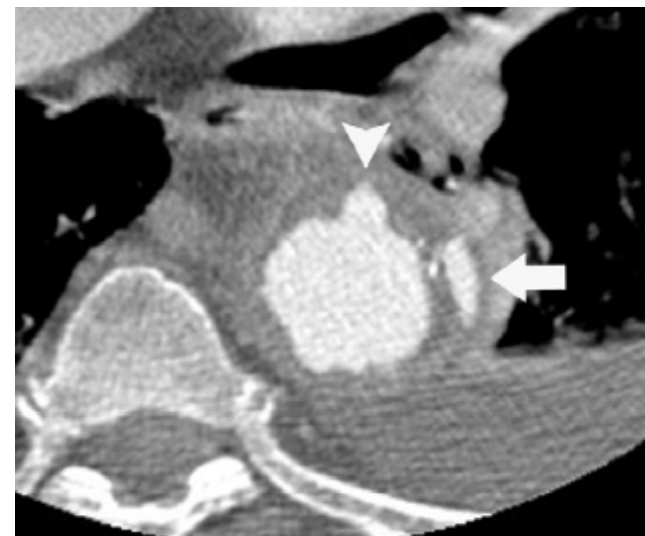
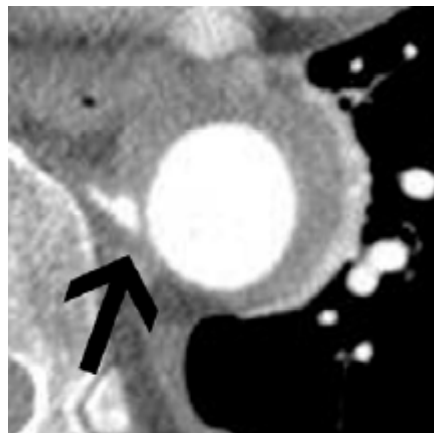
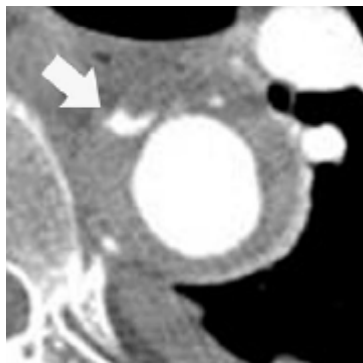
Pseudoaneurysm



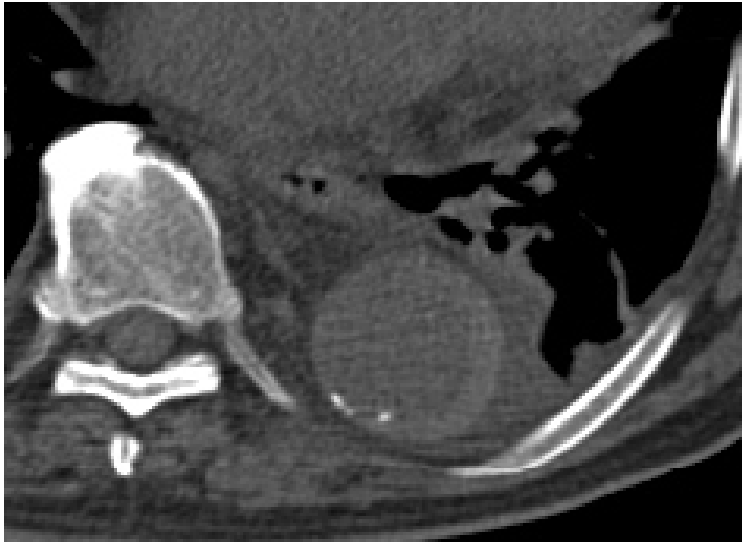
Reentry tear in IMH



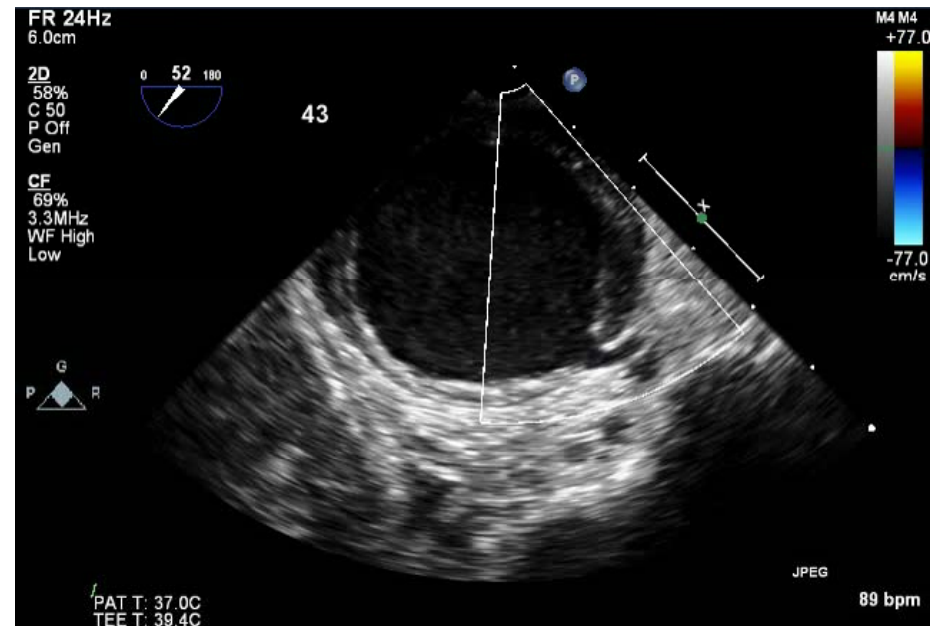
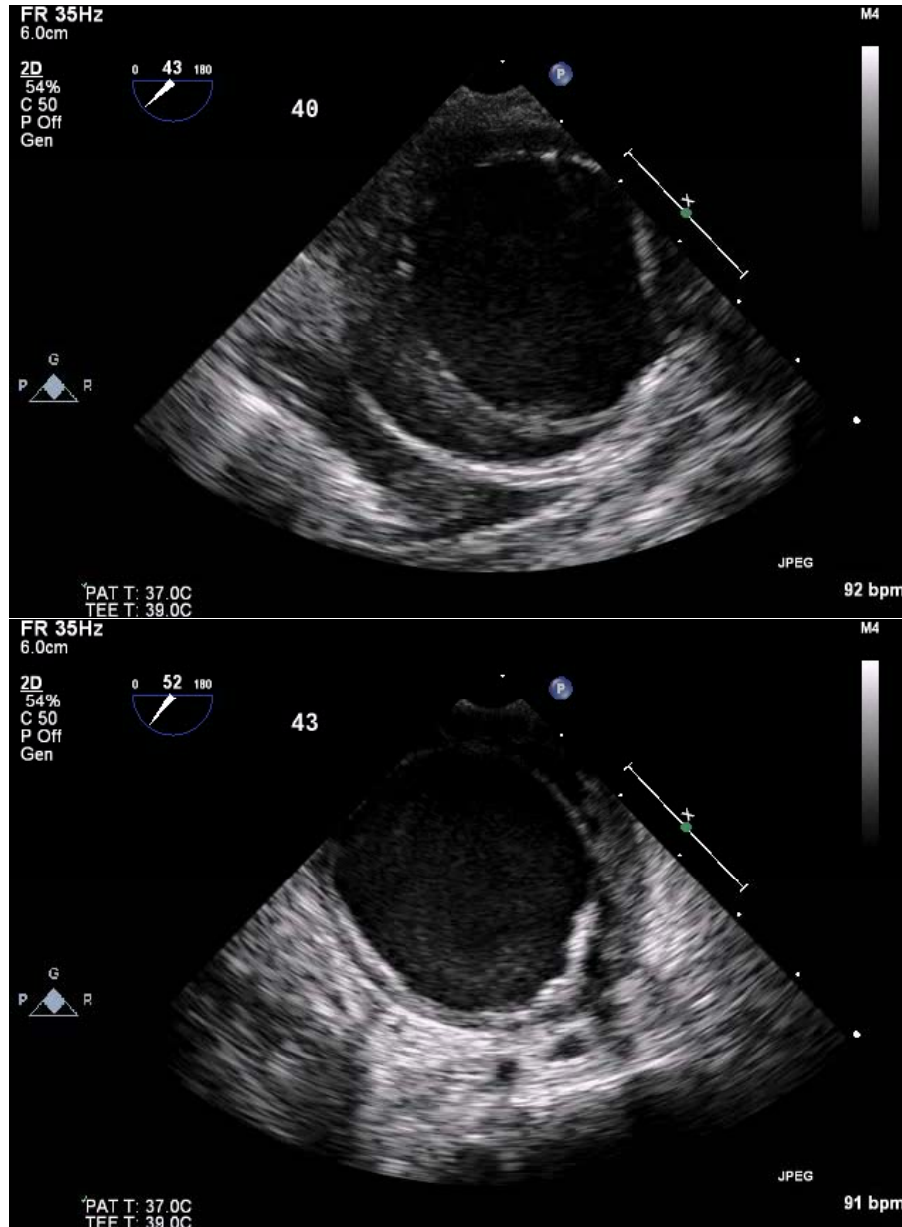
Penetrating ulcer



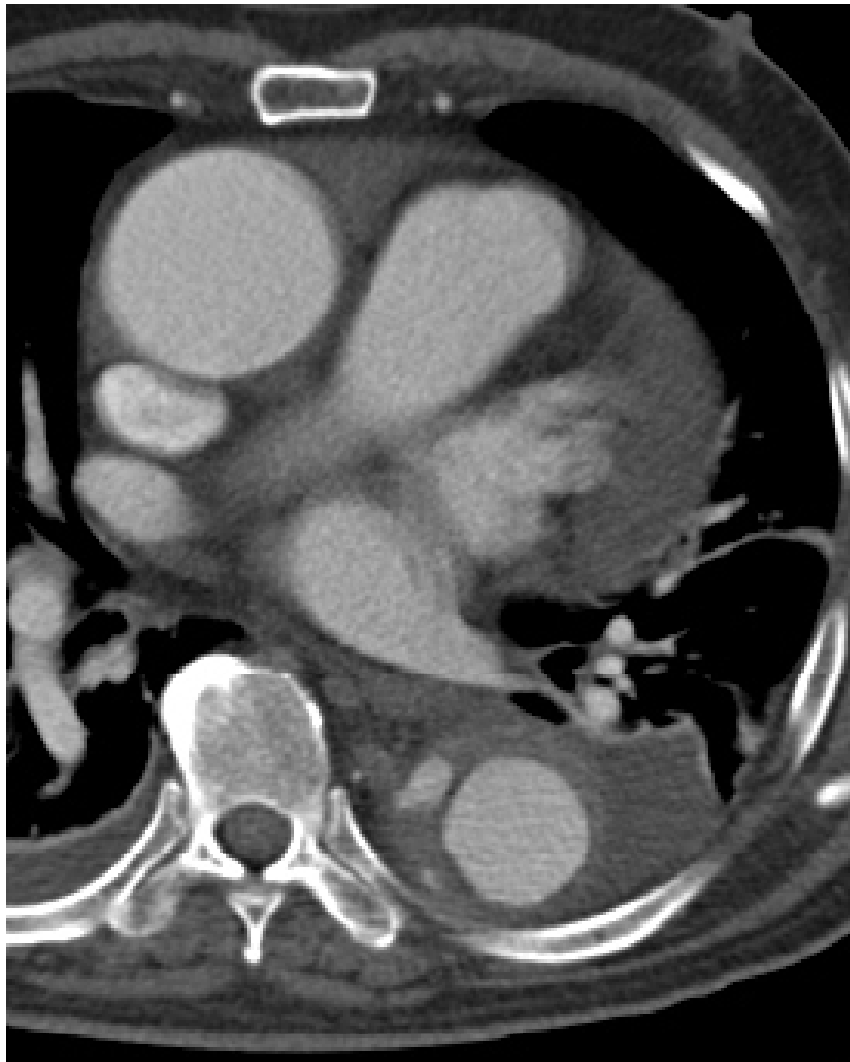
Intimal Defect or Tear in IMH



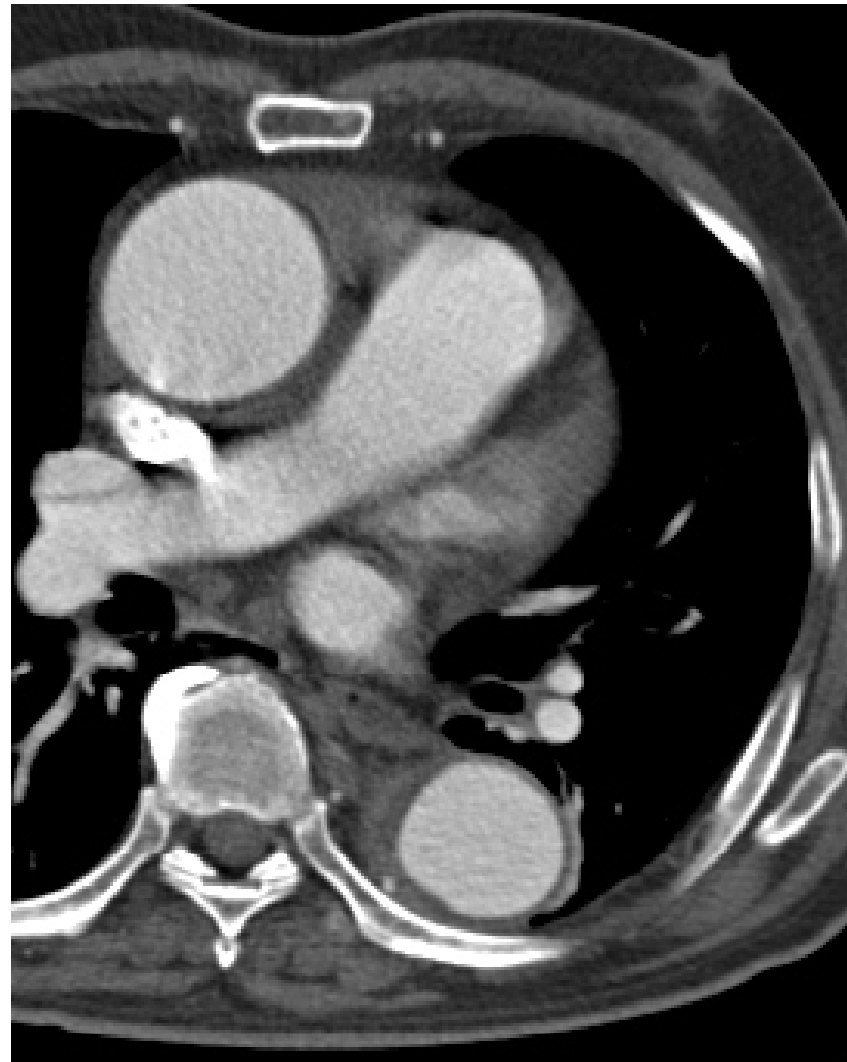
Intimal Defect or Tear in IMH



Intimal Defect or Tear in IMH

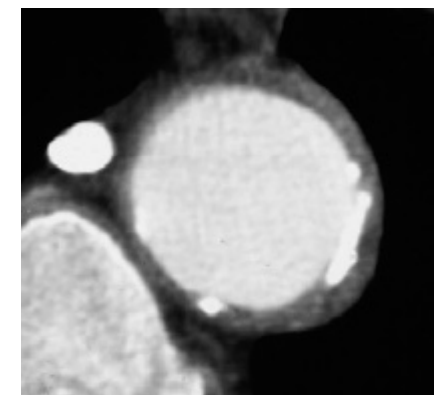
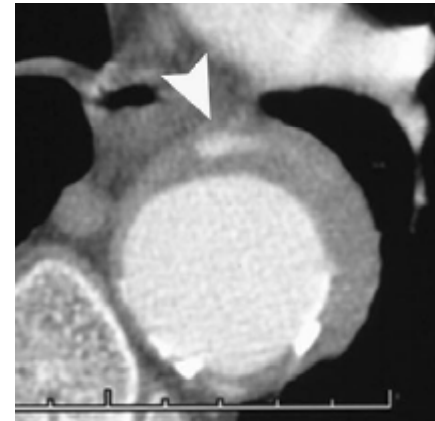
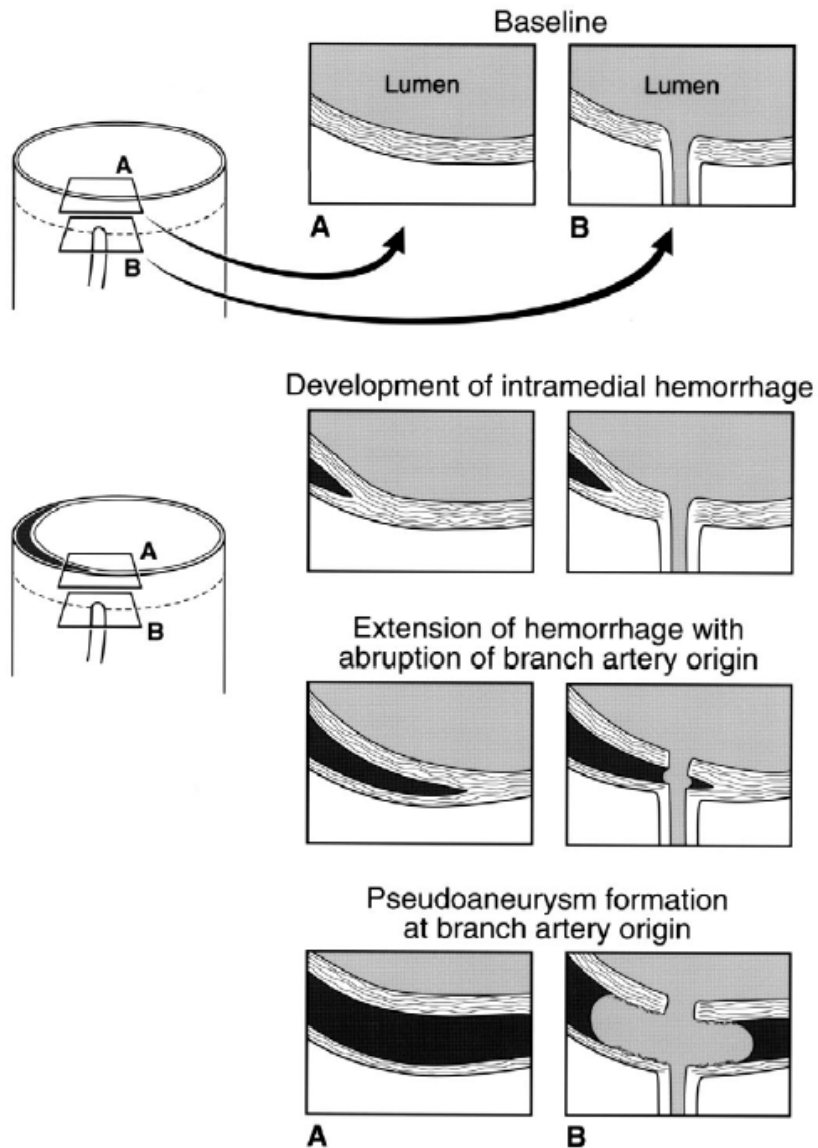


Jan 30th, 2012



Mar 6th, 2012

Pseudoaneurysm in IMH



Pseudoaneurysm in IMH



Summary/Conclusions

- FCE in patients with distal IMH are common.
- Although development of localized AD occurred more frequently in pts with FCE, hematoma resorption was the most common pattern of remodeling.
- Urgent intervention is not necessary and watchful waiting is a better option.

Disease is very old, and noting about it has changed. It is we who changes as we learn to recognize what was formerly imperceptible.

..... Jean Martin Charcot

