Coronary Artery Disease 2008

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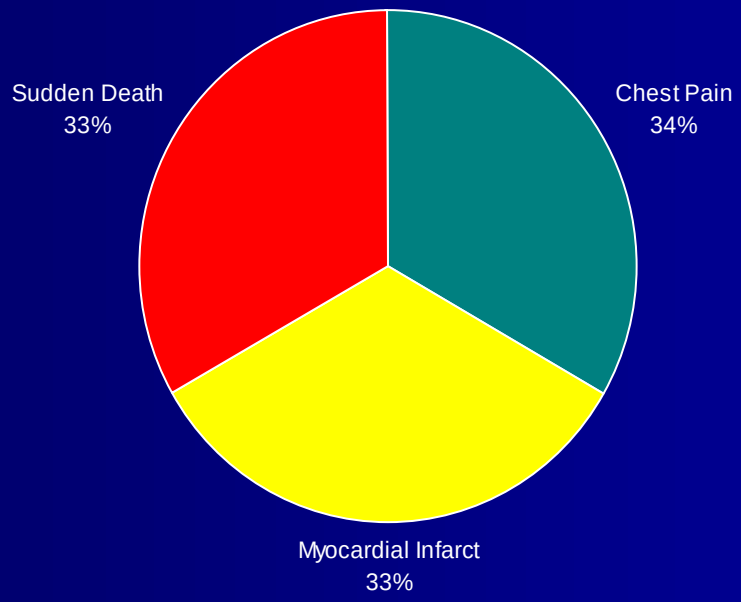
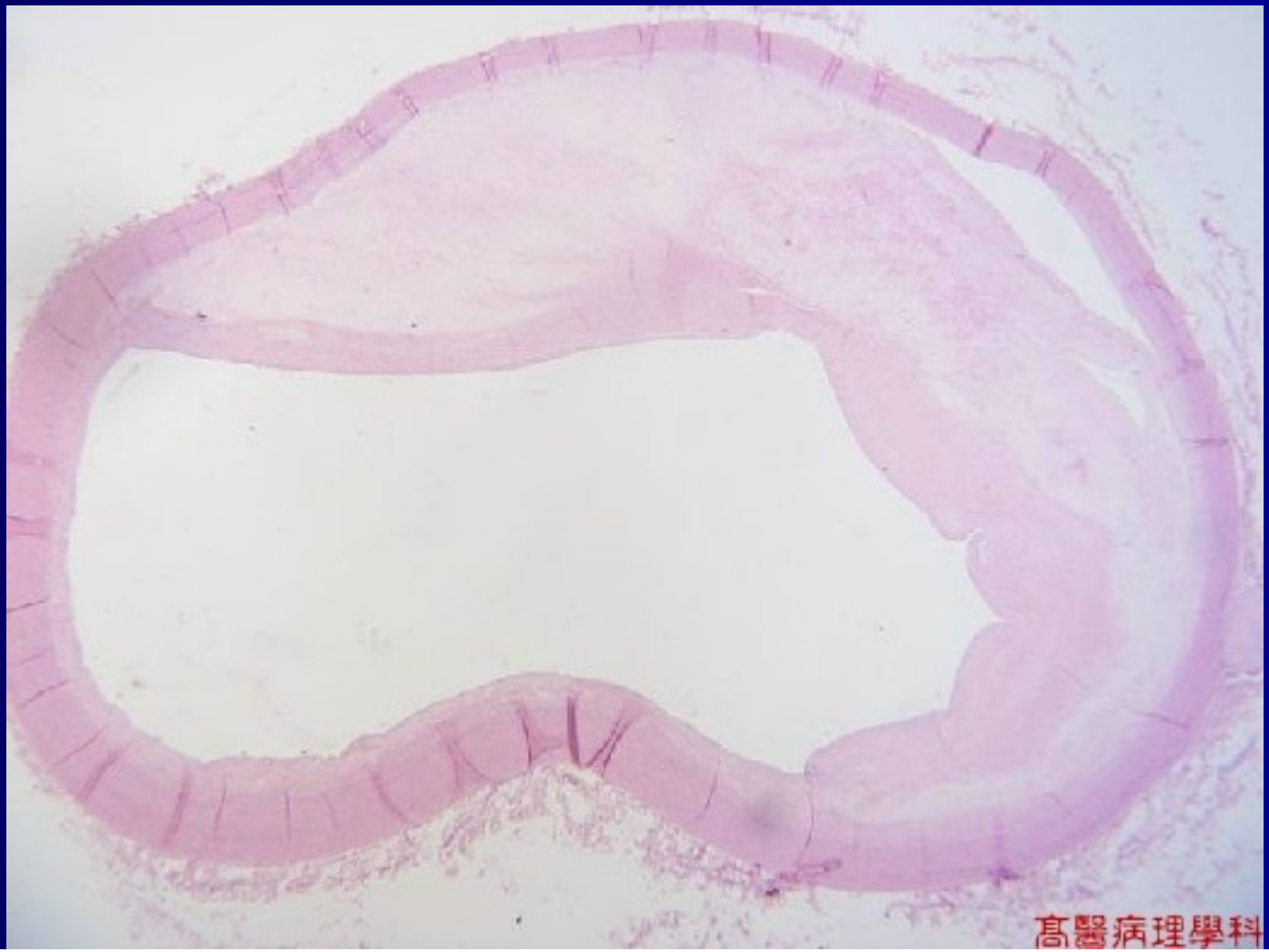
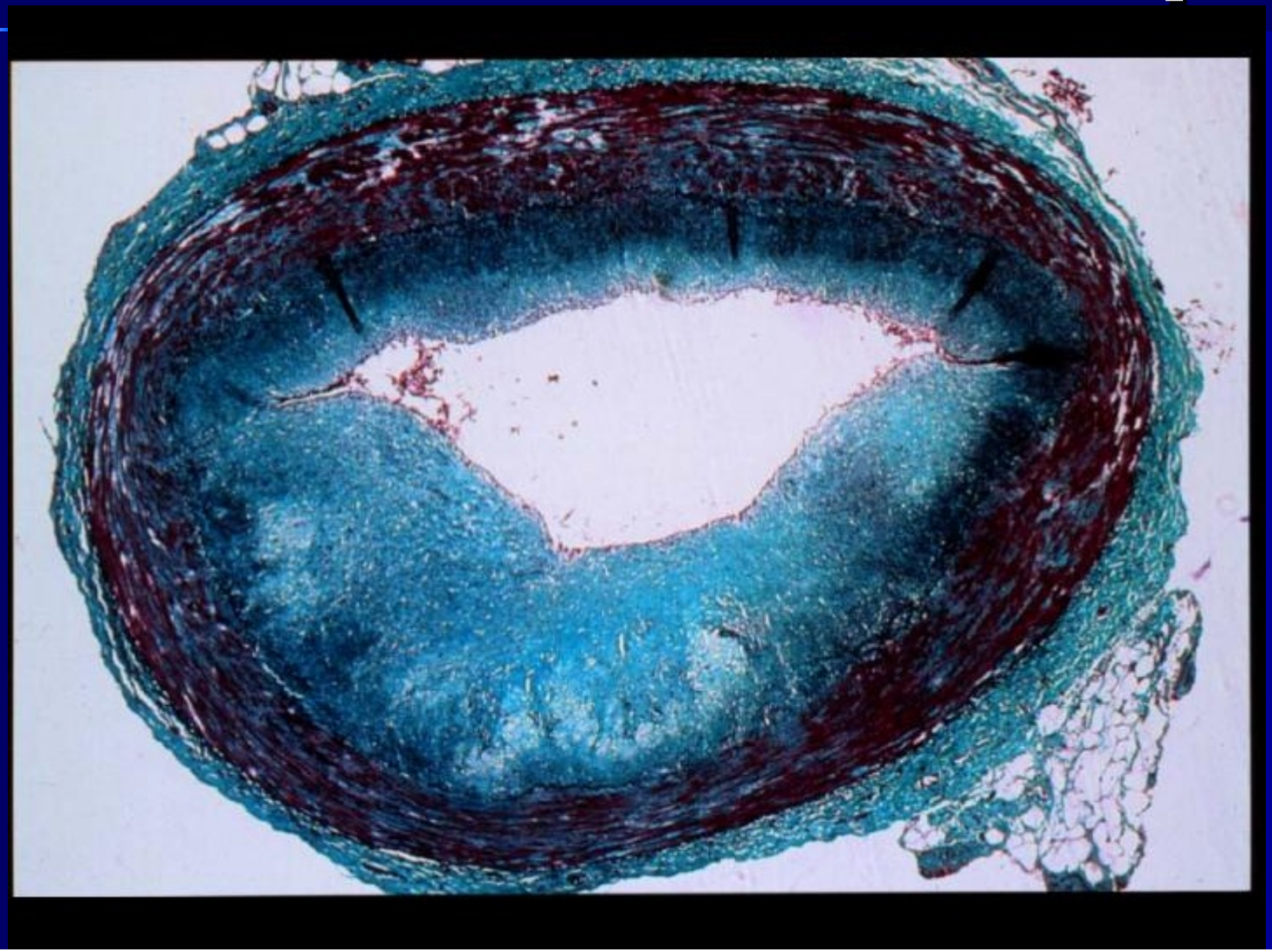
Presentation of IHD



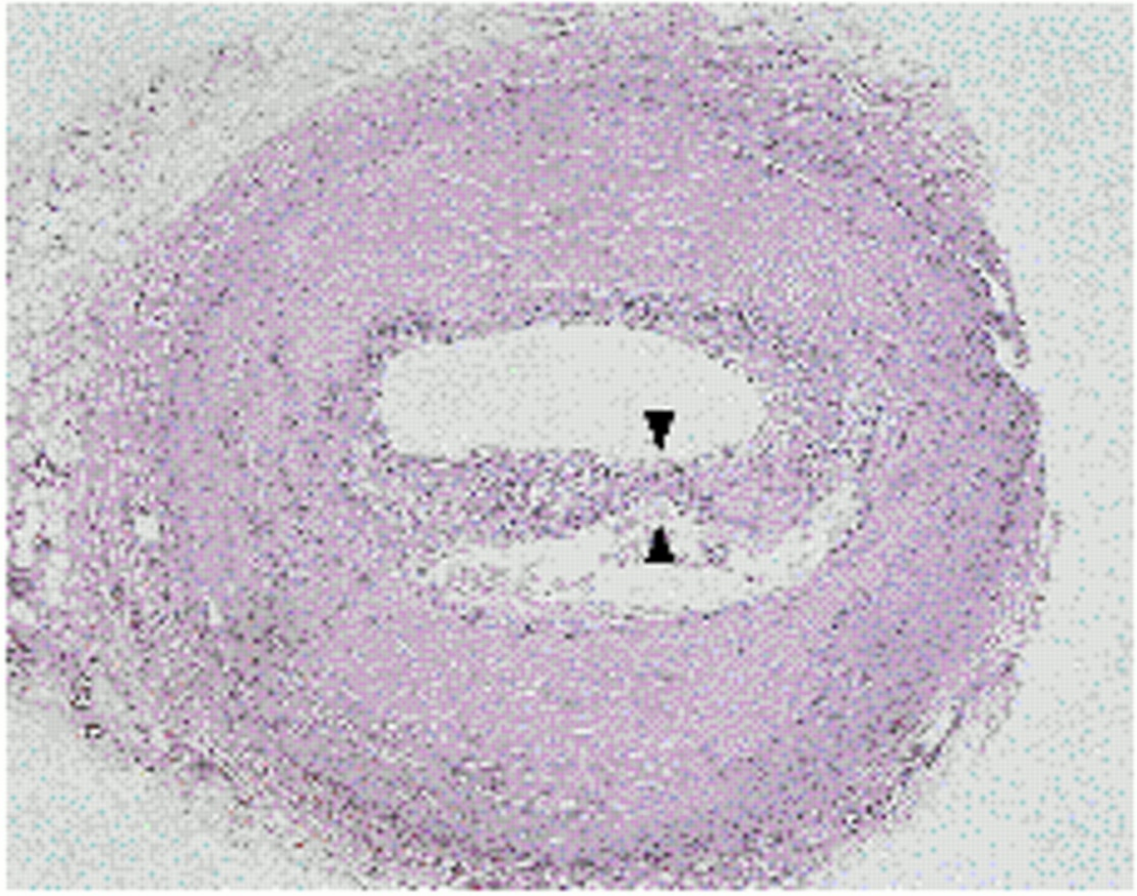
Non occlusive- stable plaque



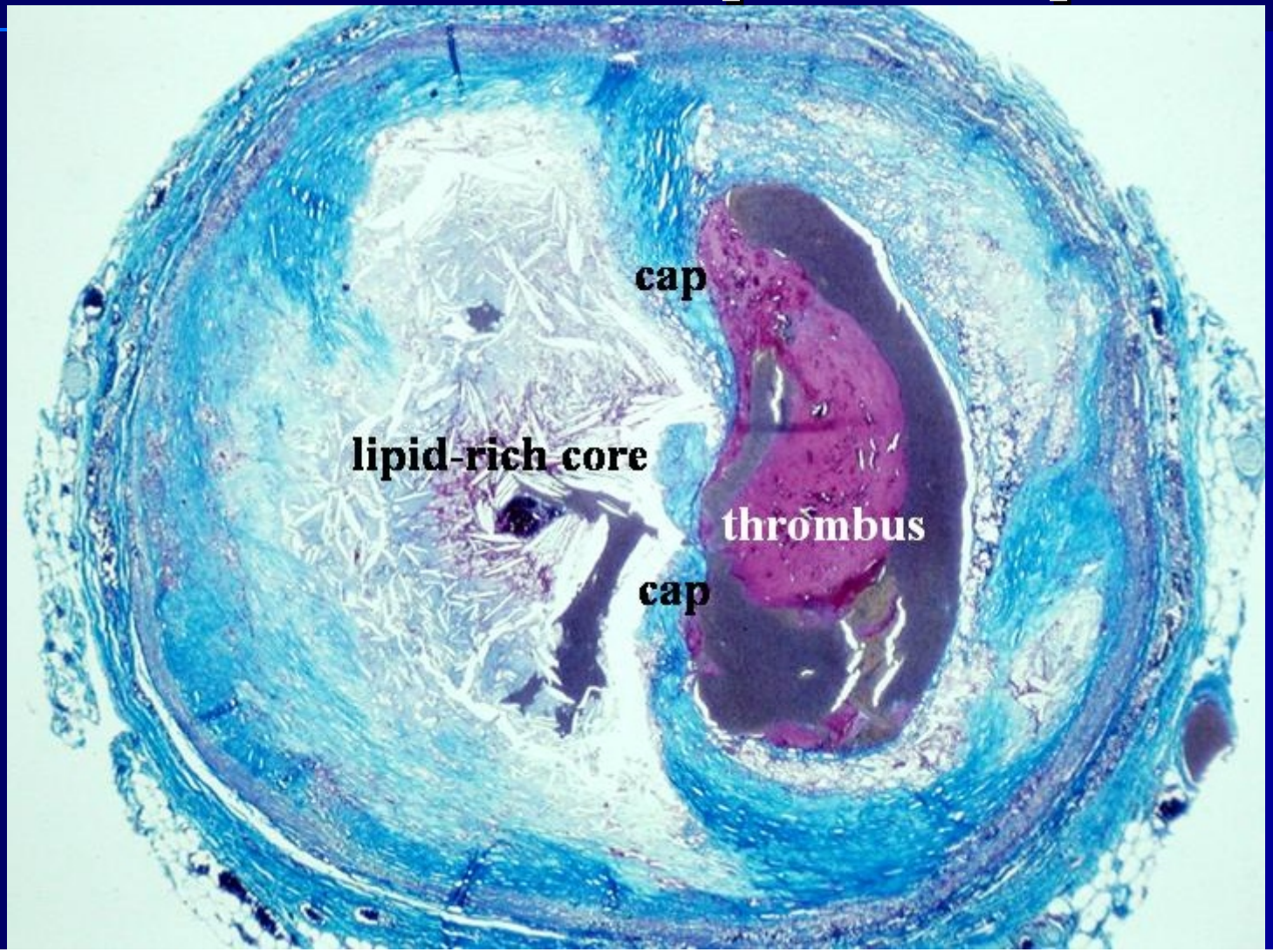
Occlusive Fibrotic Plaque



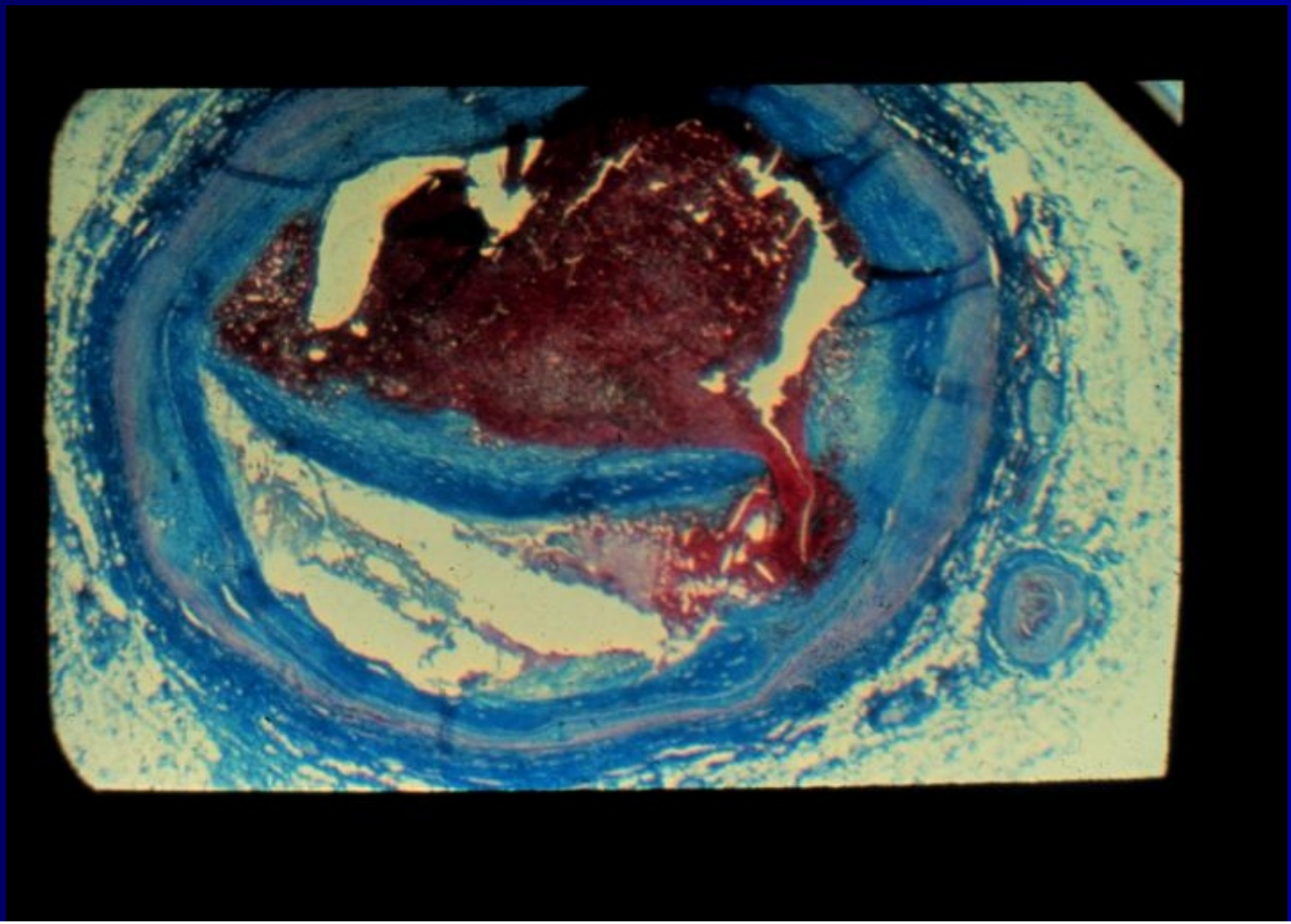
Occlusive Vulnerable Plaque



Occlusive Plaque Rupture



Non Occlusive Plaque Rupture



Myocardial Infarction

- Most commonly occurs on a non occlusive plaque and there is rupture with thrombus formation
- There are many more small plaques so statistically there is a greater chance that any MI will come form one of these
- Doesn’t mean severe or critical plaques are unimportant
- Most patients don’t have any severe plaques

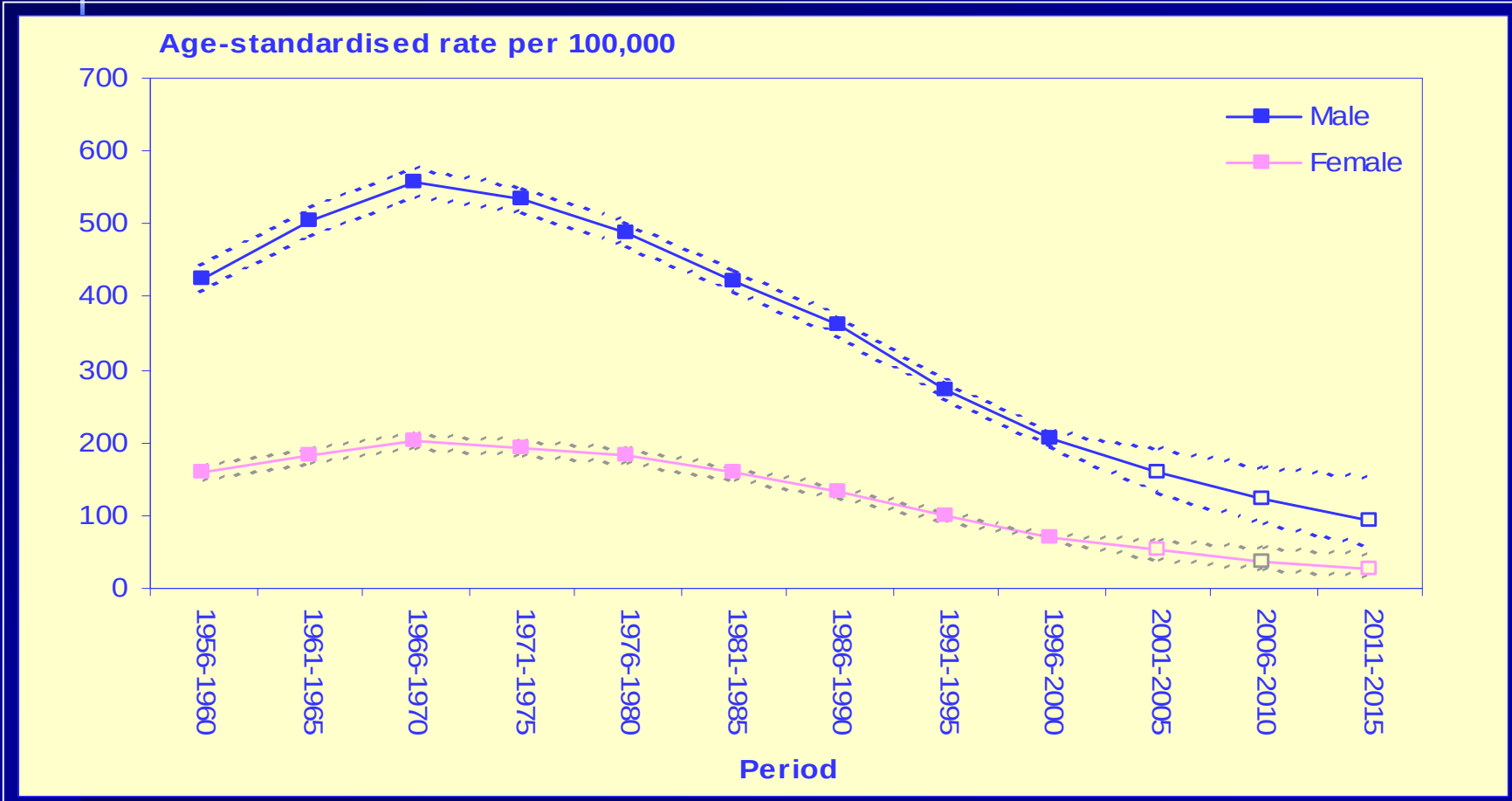
Patients who die suddenly of IHD

- Most often have a small non occlusive plaque
- Approximately 75% show rupture of the cap that separates the atheroma from the lumen, and thrombus forms
- 25% show erosion of the surface of the plaque usually with thrombus

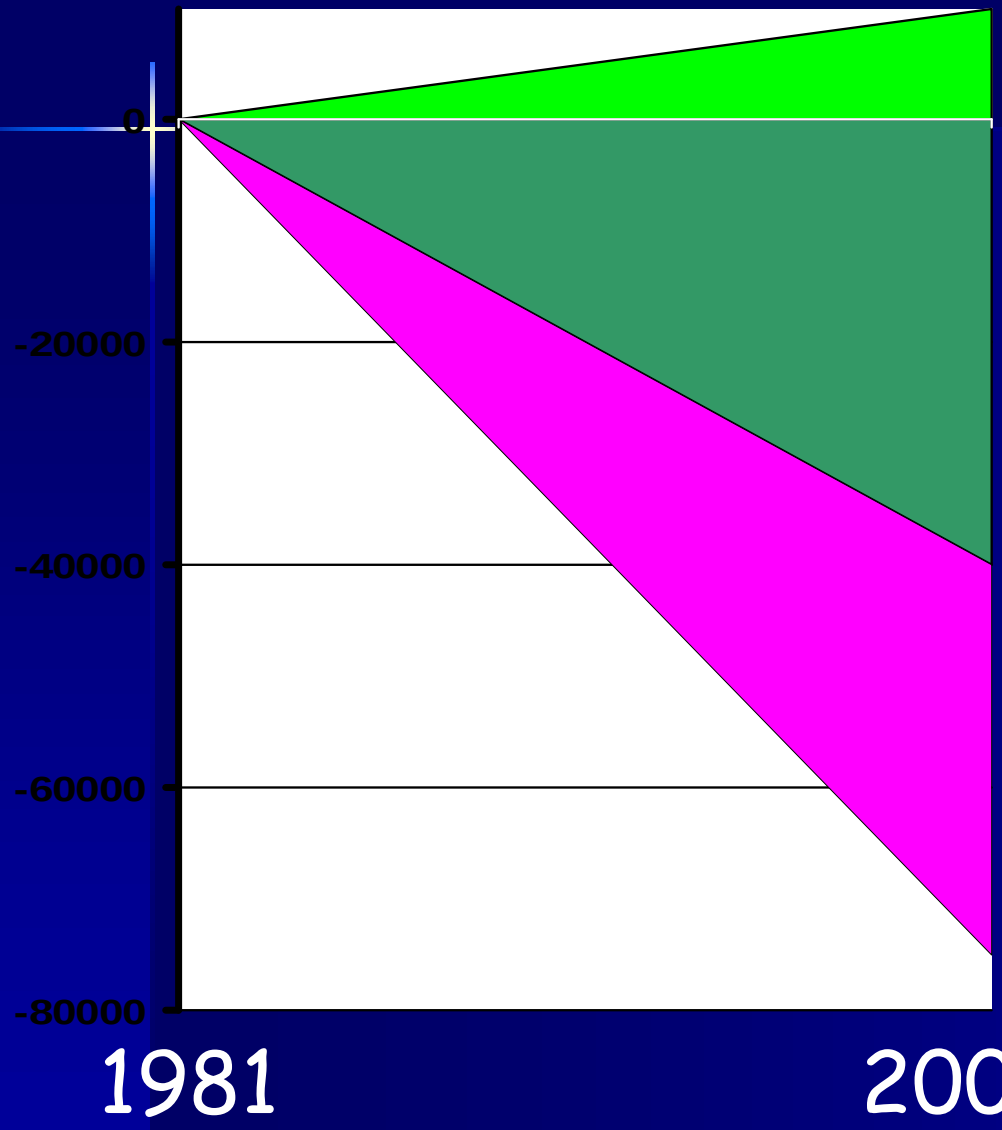
Implications for Management

- Prevention and stabilization of small plaques in asymptomatic patients is the only way to impact greatly on mortality from IHD
- Individuals with severe occlusive plaques in proximal coronary arteries need identification and treatment

Age standardised (35 – 74) IHD mortality rates and projections, 1956 – 2015, by sex, total population



Explaining the fall in coronary heart disease deaths in England & Wales 1981-2000



Risk Factors worse +13%

Obesity (increase)	+3.5%
Diabetes (increase)	+4.8%
Physical activity (less)	+4.4%

Risk Factors better -71%

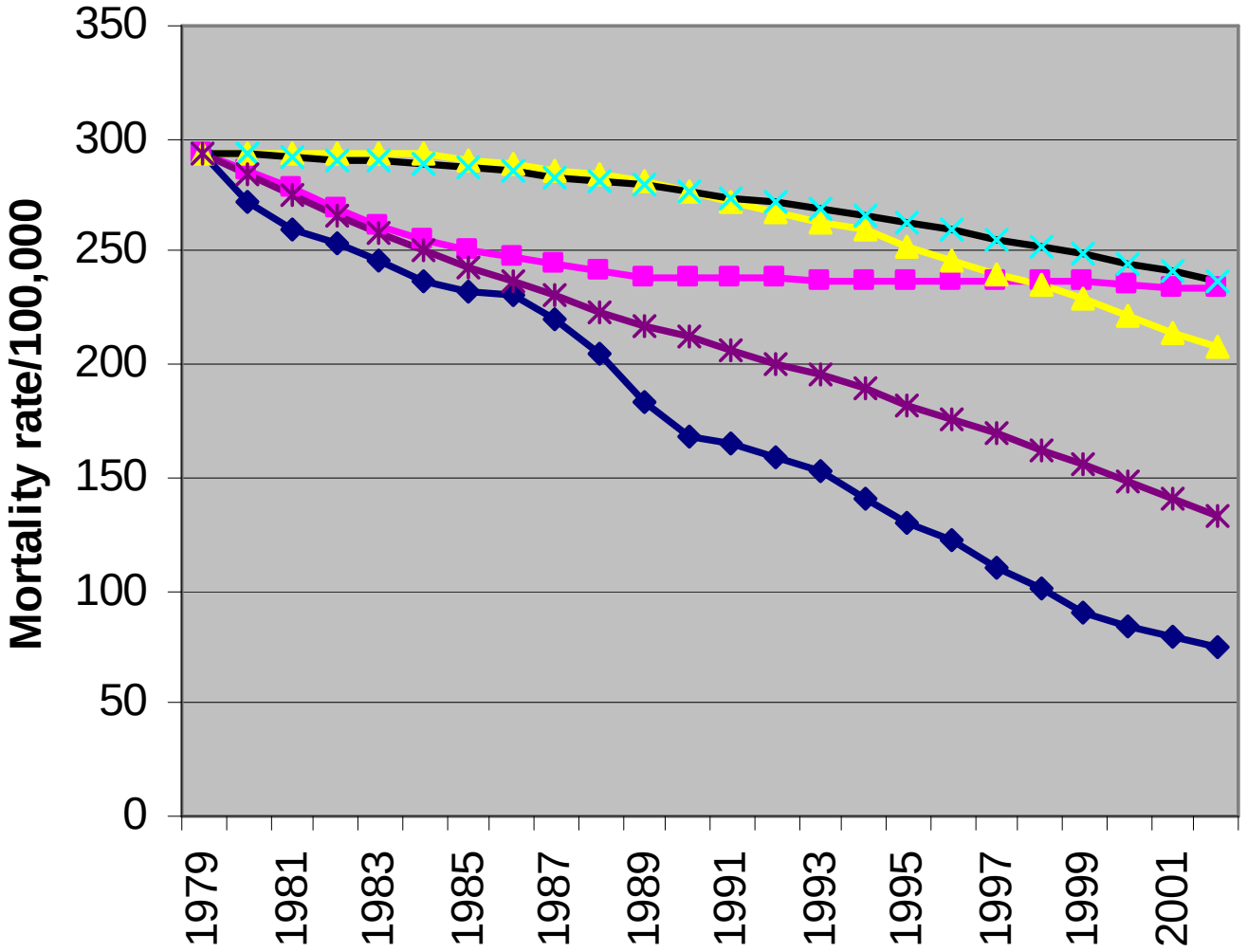
Smoking	-41%
Cholesterol	-9%
Population BP fall	-9%
Deprivation	-3%
Other factors	-8%

Treatments -42%

AMI treatments	-8%
Secondary prevention	-11%
Heart failure	-12%
Angina:CABG & PTCA	-4%
Angina: Aspirin etc	-5%
Hypertension therapies	-3%

Unal, Critchley & Capewell
Circulation 2004 109(9) 1101

Observed trend in CAD mortality with calculated contribution of risk factors - MALES



Management Strategies

- Population based public health measures e.g. oils/salt, exercise
- Individual risk factor modification
- Identifying and treating patients with established disease

Targeted Risk Factor Modification

- Pivotal role of the General Practitioner
- The role of a casual comment to your patient about a lifestyle improvement

e.g. its really good for you do a bit more exercise, you know too many takeaways are bad for you, you need to stop smoking

Screening in General Practice

- Current age for screening under review (45 for men and 55 for women)
- Age, Family history, ethnicity, Blood Pressure, weight, height, waist circumference, Glucose, Lipids
- Aim to reduce 5 year cardiovascular risk to less than 15%
- Thresholds for pharmacological treatment

Chest Pain Assessment Unlikely Cardiac

- Low grade rest pain
- localized pin point pain
- sharp stabbing character
- present for many years especially in a younger patient

Variations in cardiac pain

- Sometimes precipitated by stress
- belching
- sweating
- breathlessness
- rest pain

Looking at the whole patient

- The more risk factors a patient has, the greater the chance of coronary disease
- Any chest pain in a very high risk patient is a cause for concern
- Low threshold for referral if cardiac cause not ruled out
- Refer patients with typical symptoms for risk stratification

Treatment while waiting for Out Patient assessment

- Minimum is low dose aspirin
- B Blockers +TNG for most patients if there is a reasonable likelihood of IHD especially if there is a long delay. No B Blocker on day of treadmill
- Treat risk factors

Investigation of CAD

- Functional Tests – detect flow limitation due to reduced supply (epicardial or resistance), or increased demand
- Anatomical – imaging the artery

Functional Tests

- Detect only flow limiting epicardial disease where collateral circulation is inadequate and area of ischaemia is significant – provide risk stratification
- Exercise ECG
- Stress Echo
- Nuclear Imaging
- Fractional Flow Reserve

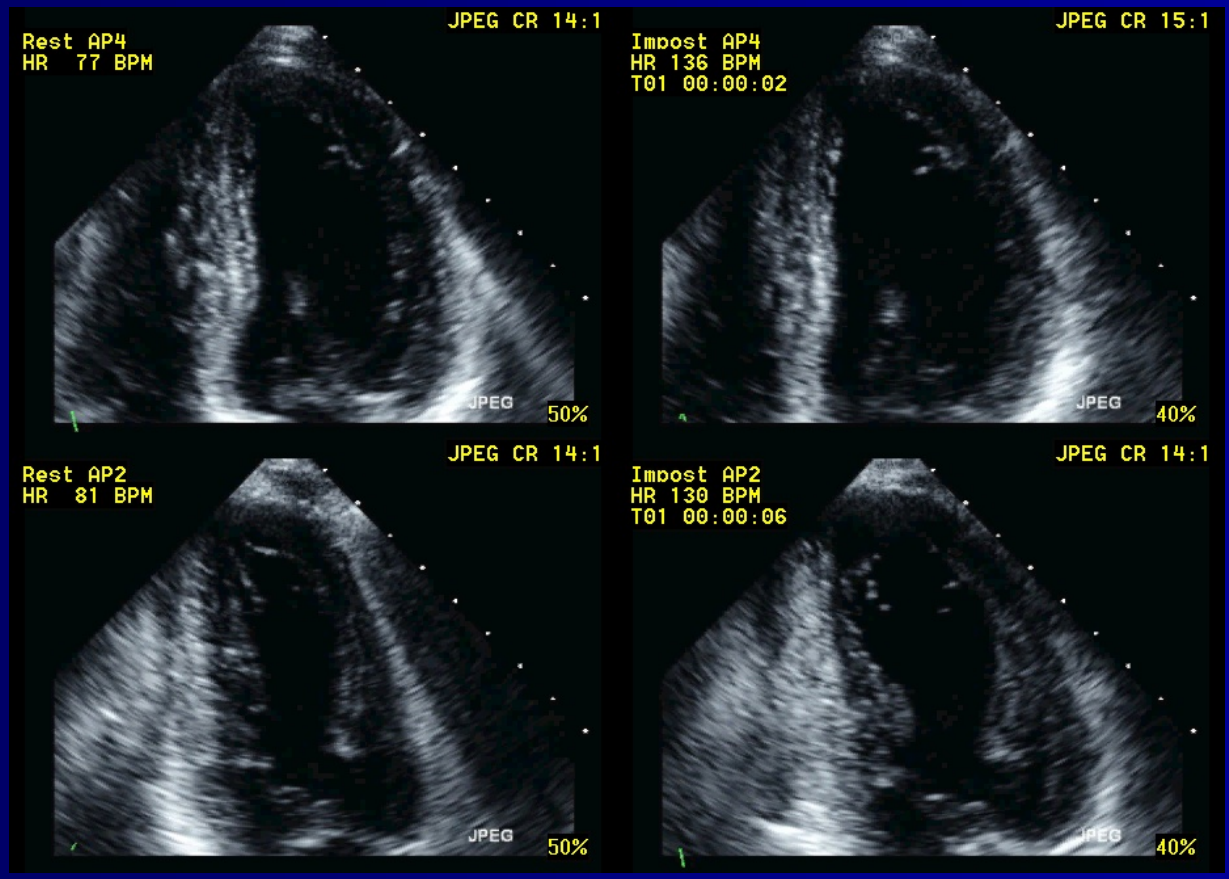
Treadmill Testing

- Most useful in patients with 50 % chance of having CAD
- false negative rate of 20-40%
- false positives a problem
- avoid B Blockers for a diagnostic treadmill

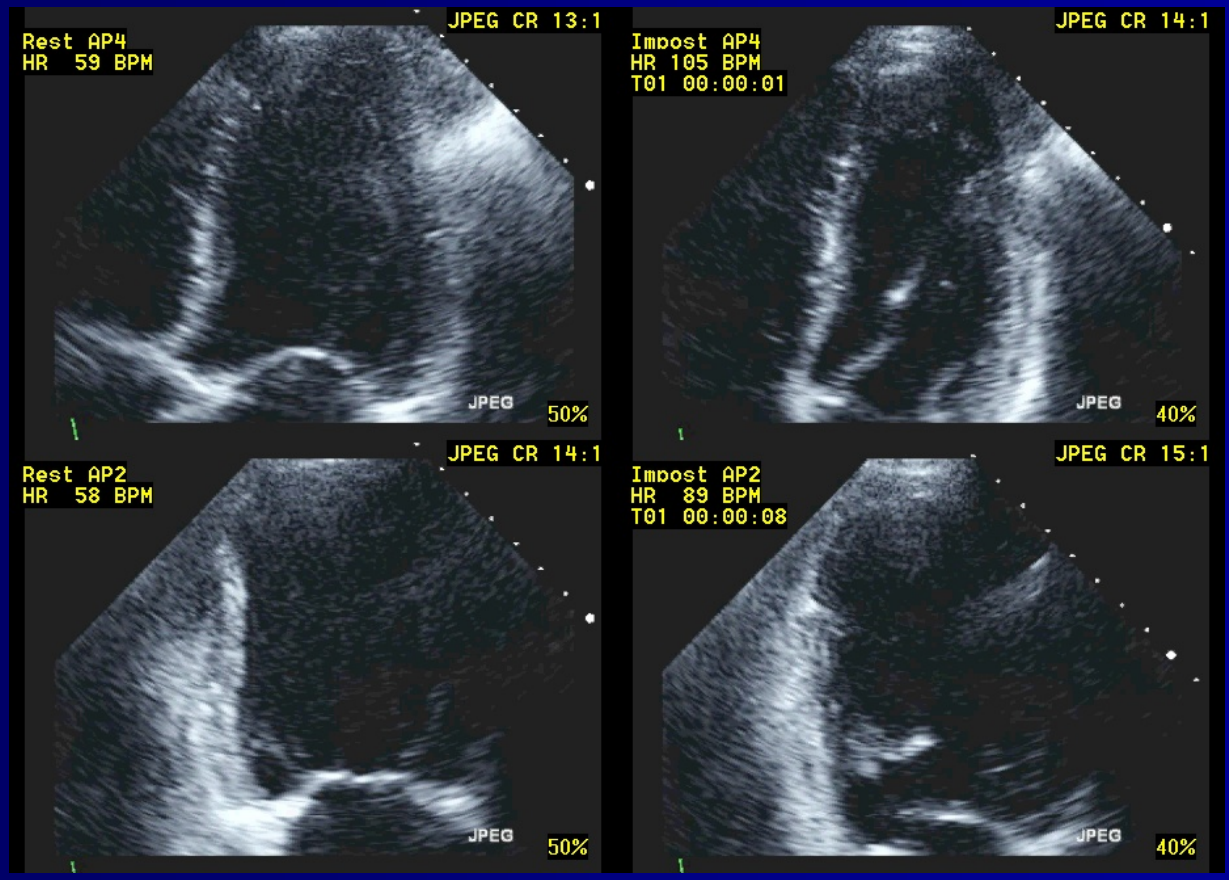
Stress Echocardiography

- Done as part of an ETT
- Uses subjectively assessed wall motion
- Detects major ischaemia
- Higher accuracy than treadmill
- Much fewer false positives
- Additional information available
- Can use dobutamine if patient cannot exercise

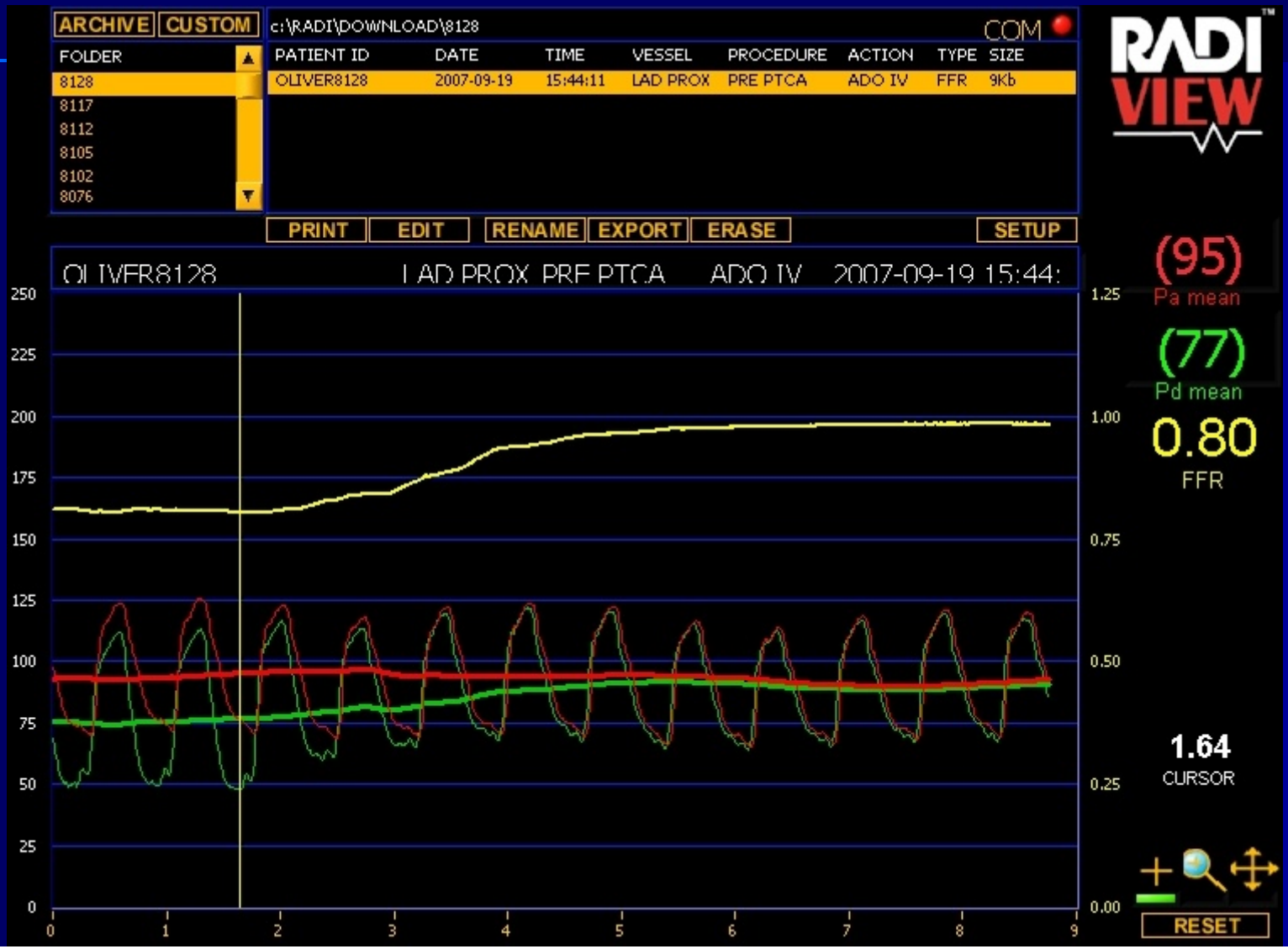
Normal Stress Echo



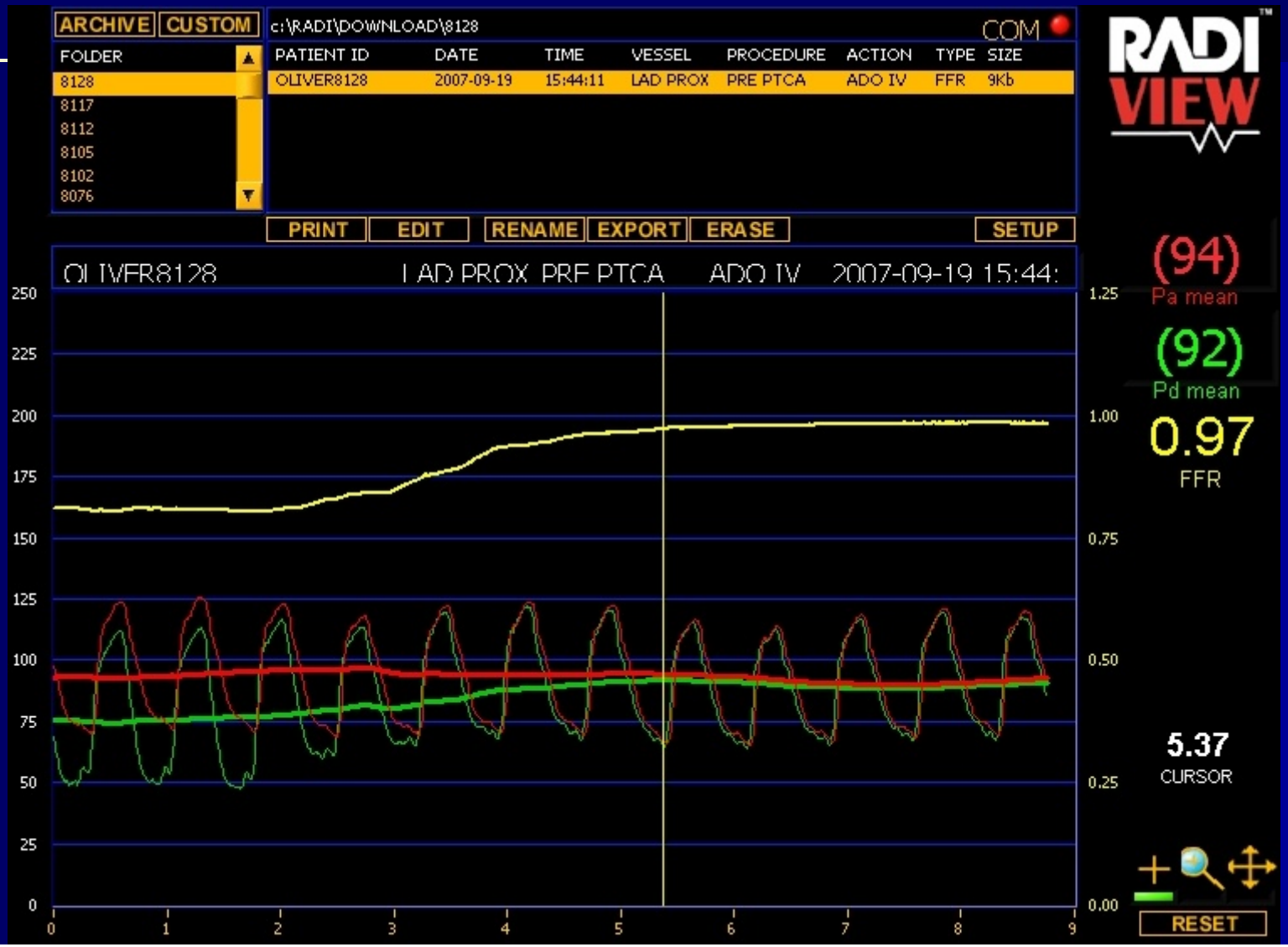
Stress Echo – LAD lesion



Fractional Flow Reserve



Fractional Flow Reserve

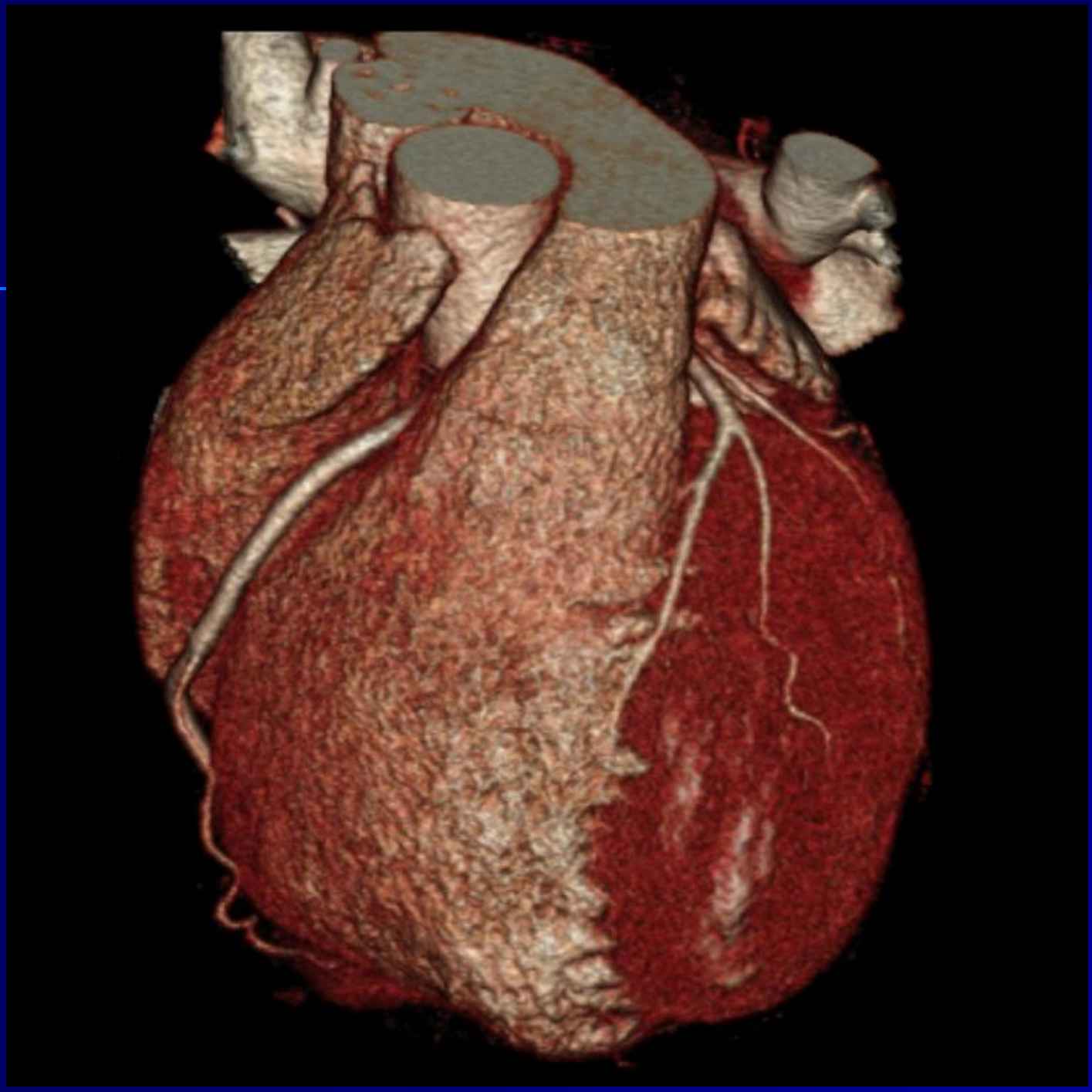


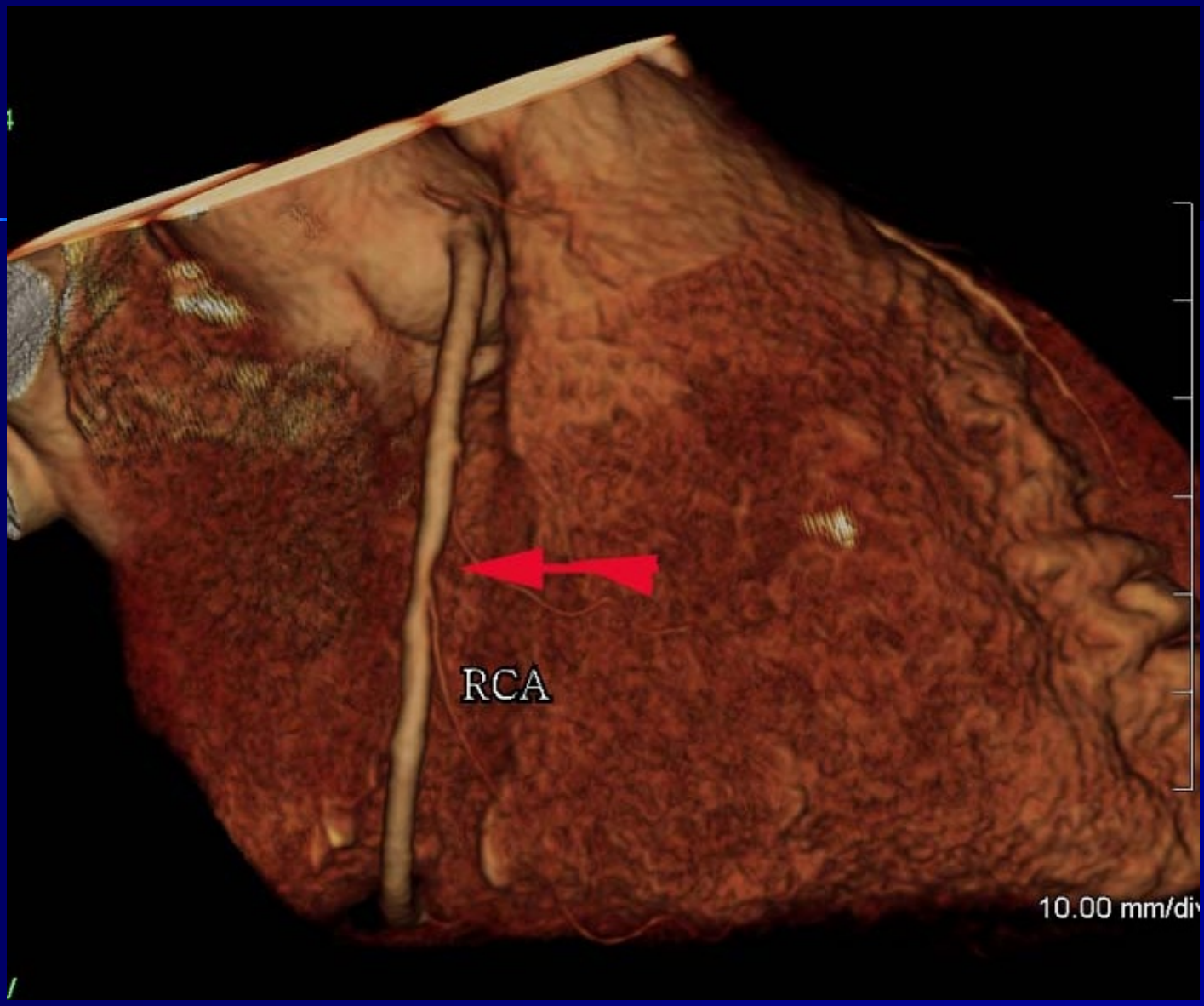
Anatomical Imaging

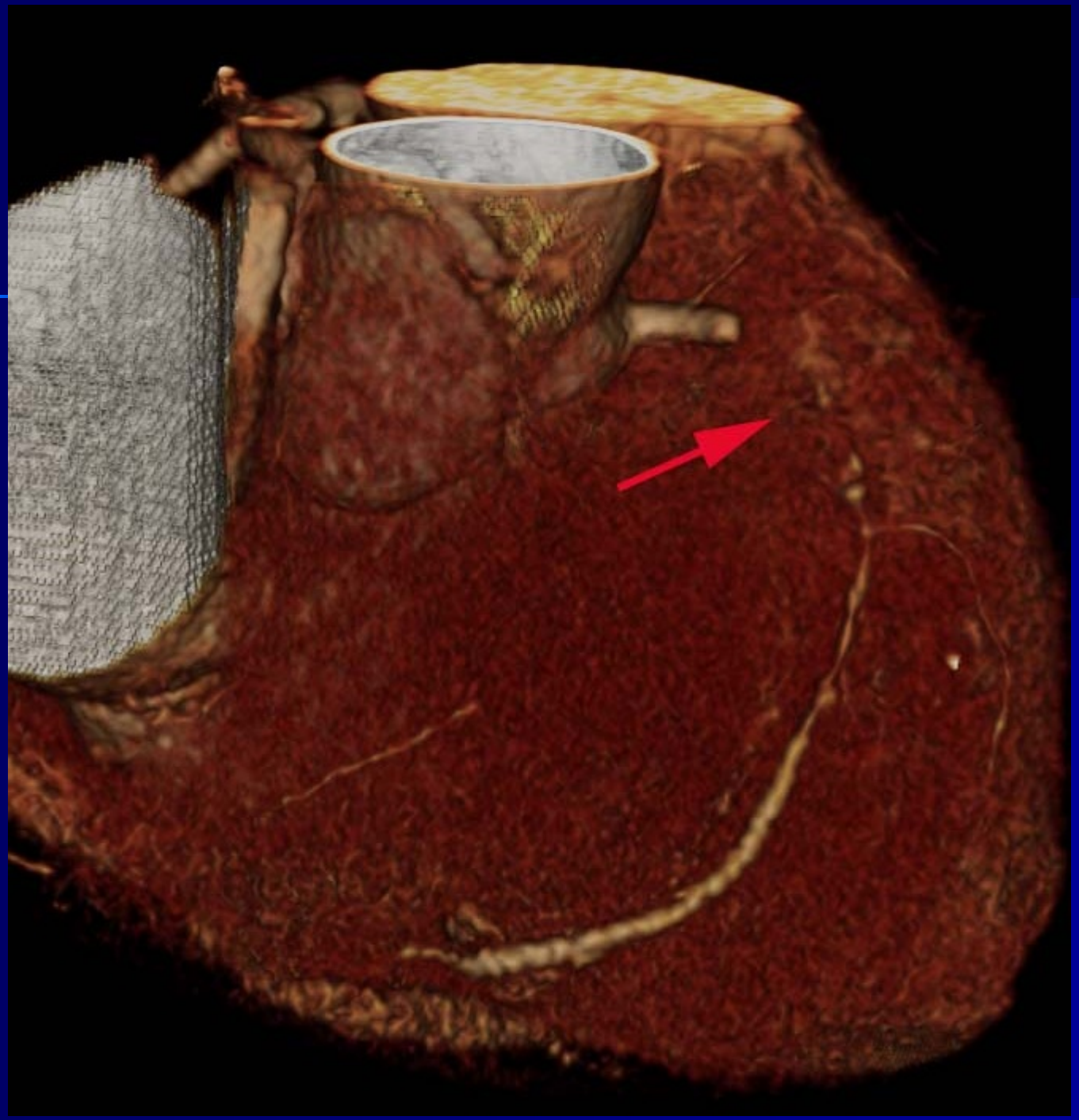
- CT coronary angiogram
- Invasive coronary angiogram
- Intravascular Ultrasound

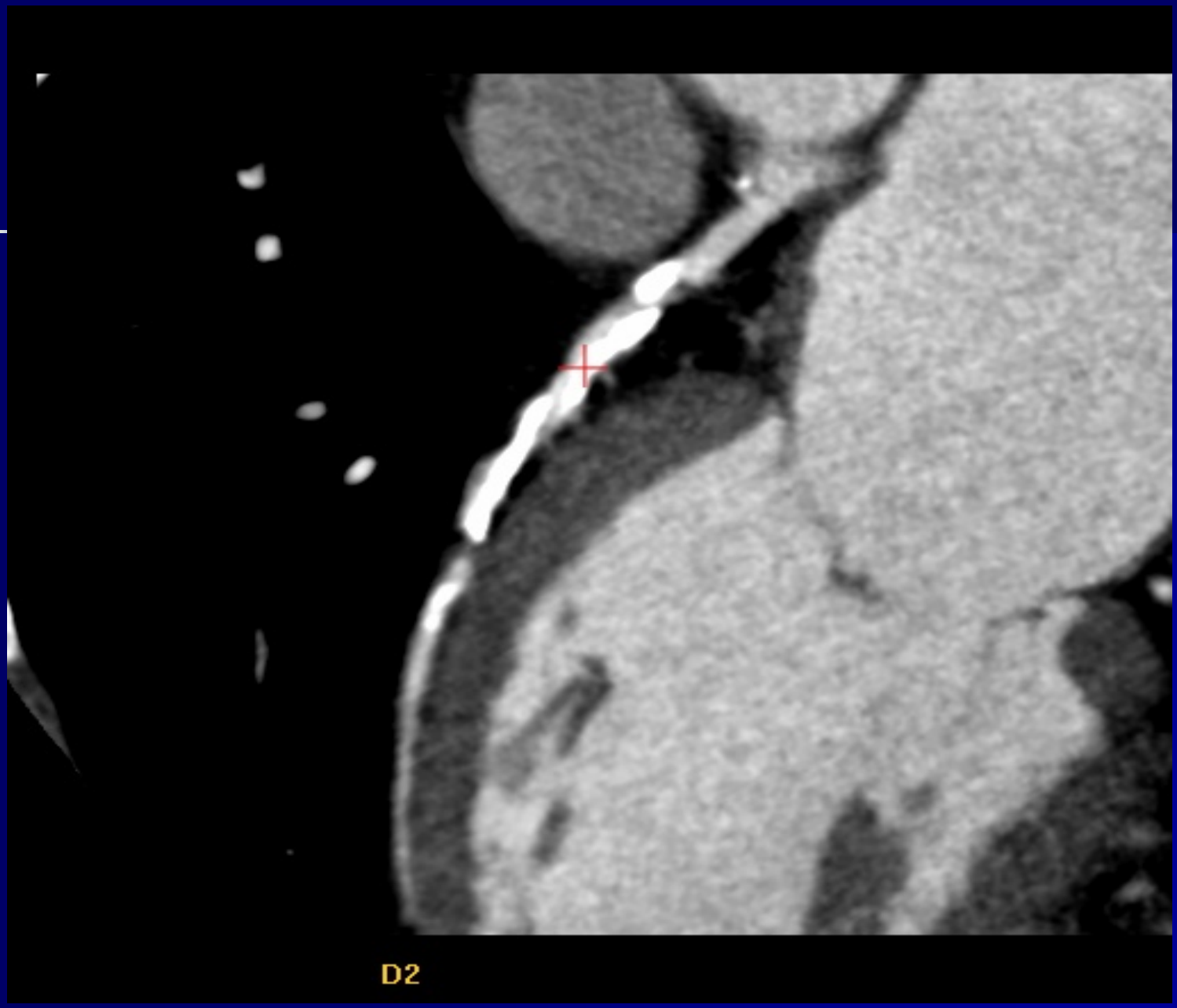
CT Coronary Angiography

- 64 Slice CT scan
- Intravenous Contrast injection
- Heart Rate needs to be slow – B Blockers, AF very difficult
- Significant Radiation Dose 1/1500 CA
- Vessel size of 2mm or grater
- Calcification may be a problem




RCA
10.00 mm/di

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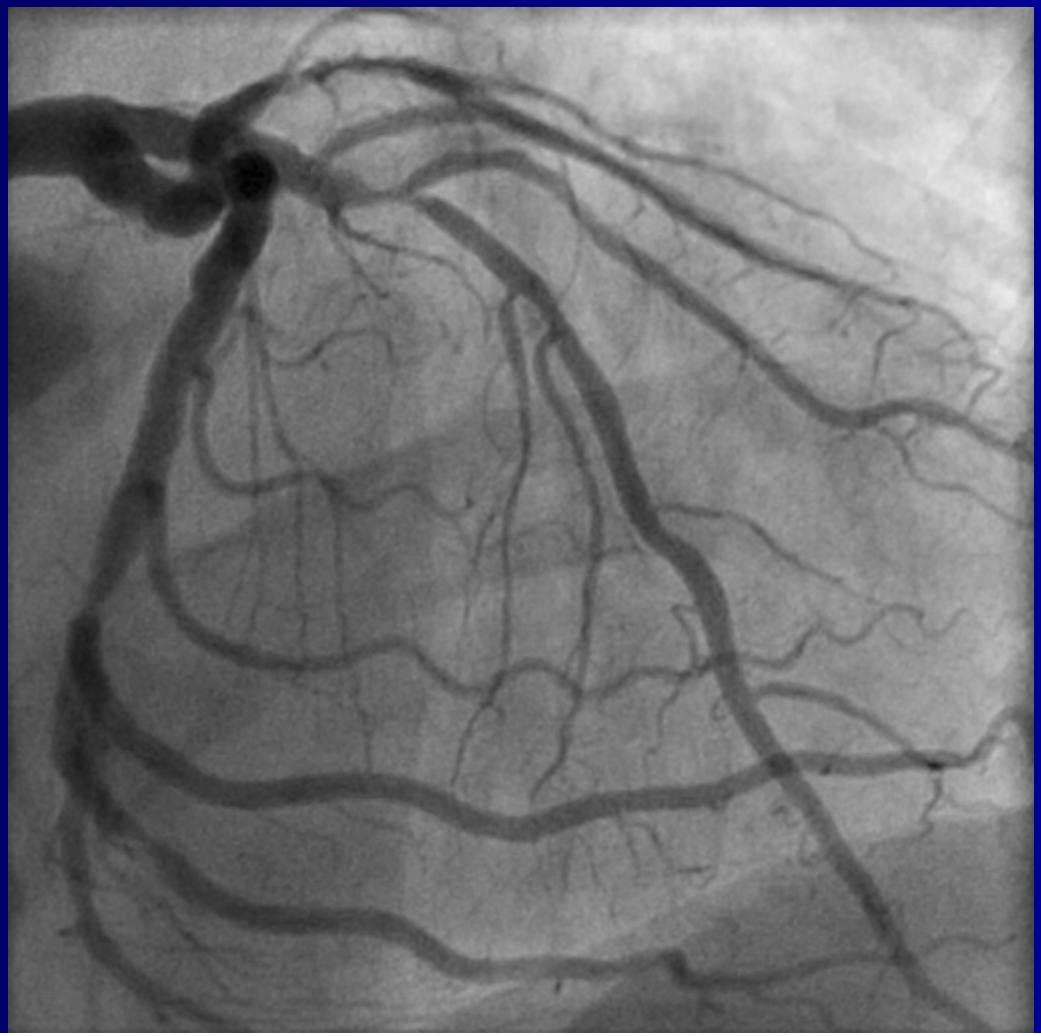
Role Of Coronary CT

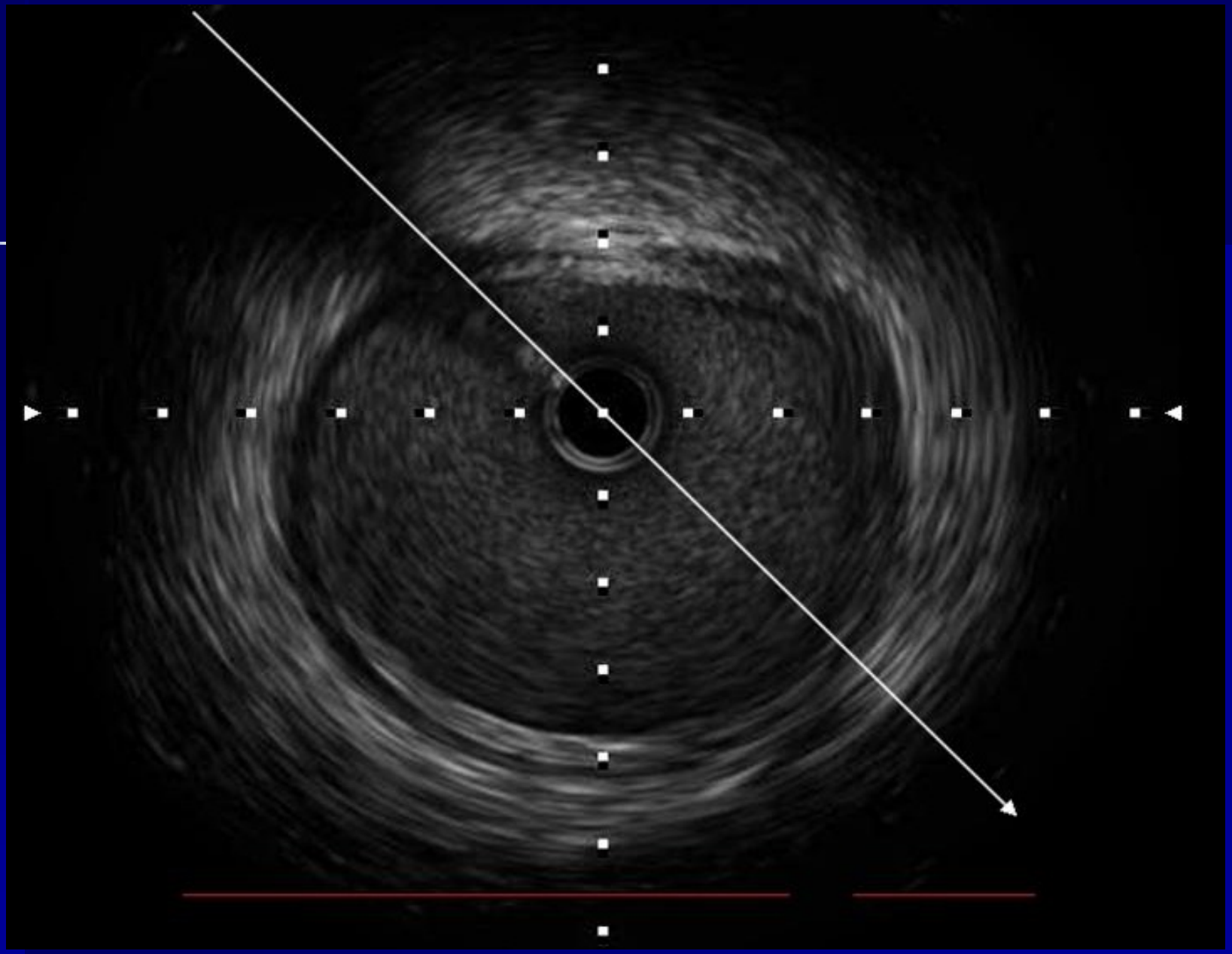
- Intermediate probability of disease where the patient has chest pain
- Asymptomatic multiple risk factors
- to convince the patient to adhere to treatment
- Patients with a high Calcium score
- High negative predictive value
- Many false positives

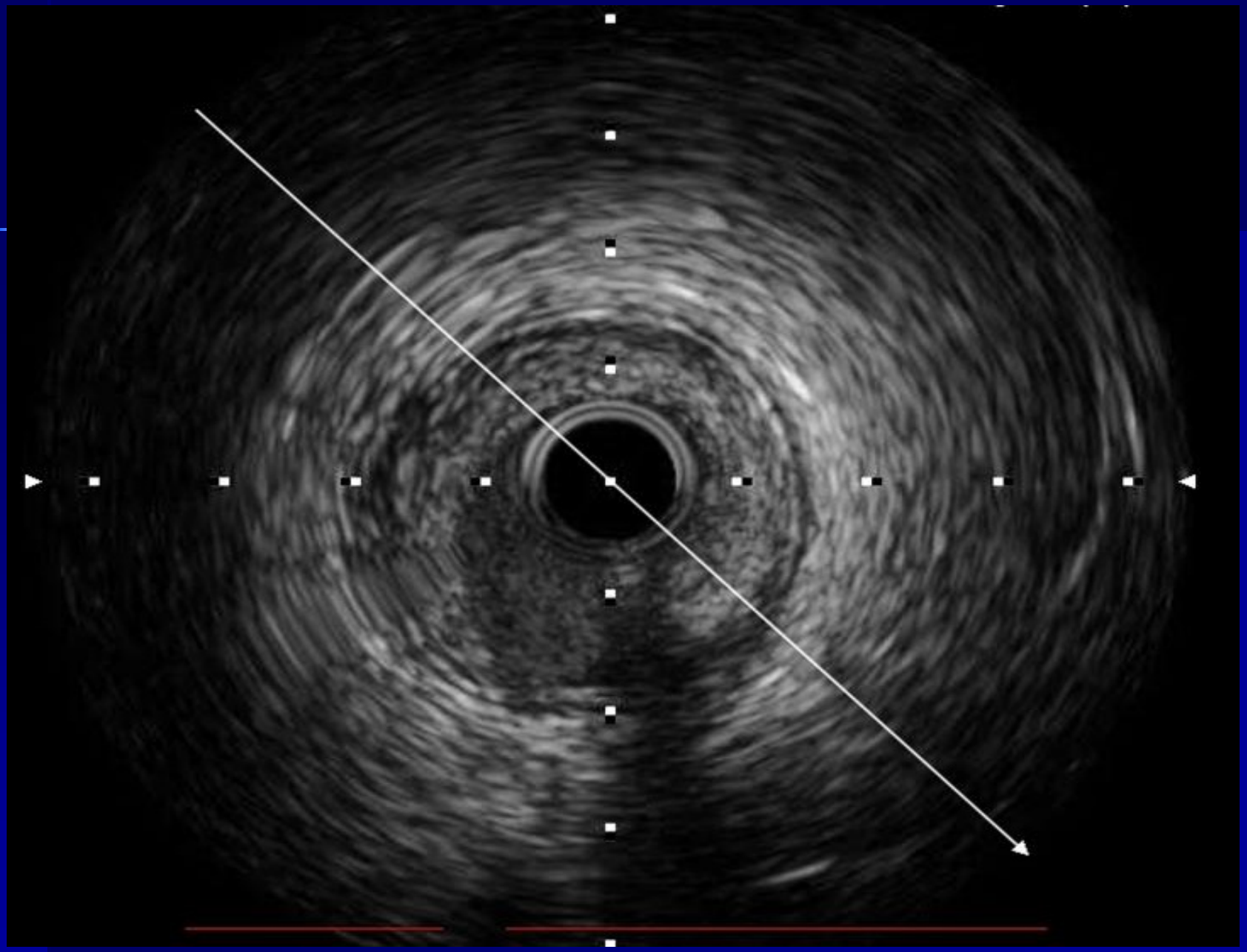
Indications for Invasive Angiography

- strongly positive non invasive test
- younger patients where a definite diagnosis is indicated
- where angioplasty rather than drugs is an alternative method of treatment

Coronary Angiogram







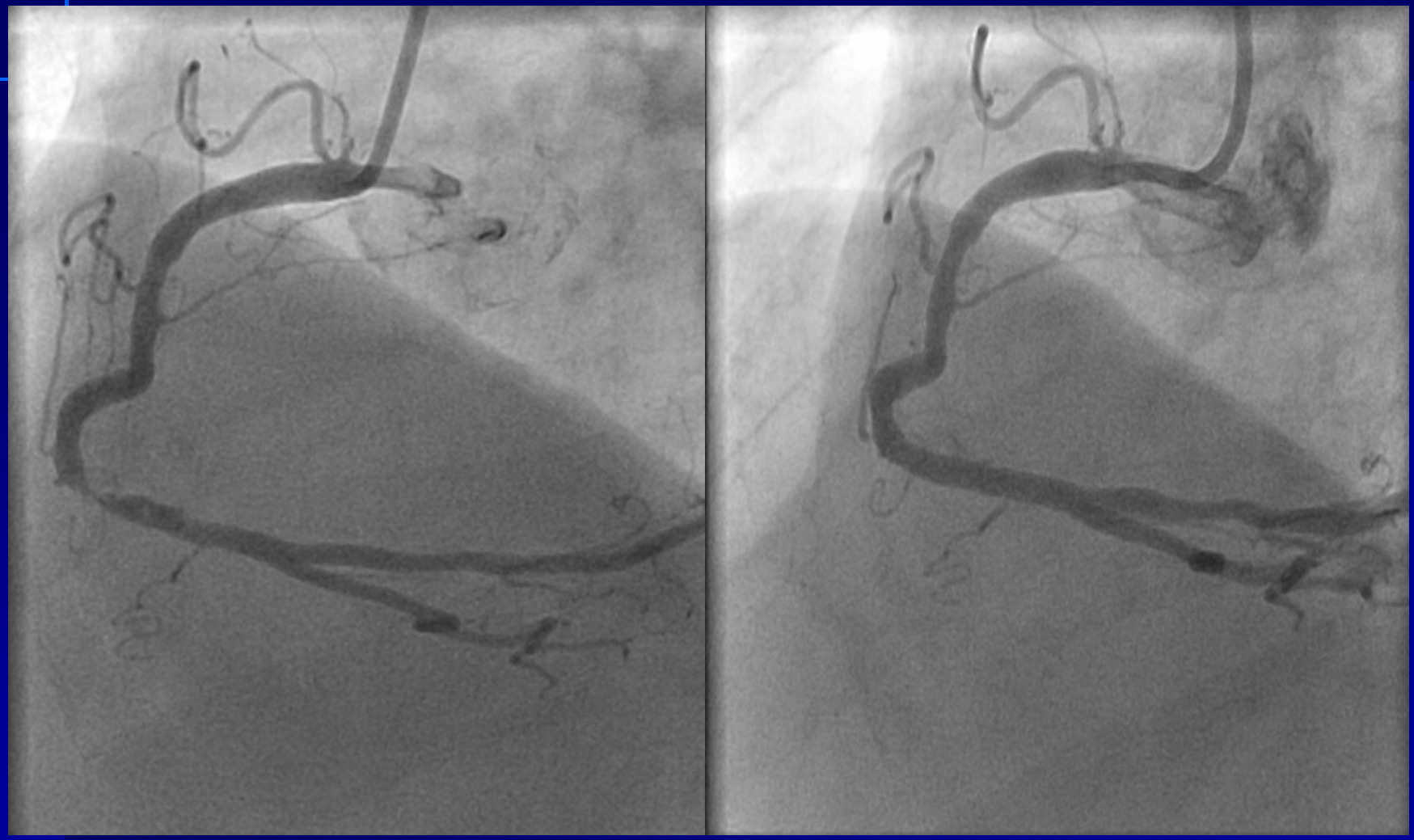
Coronary Angioplasty

- Renamed PCI
- Main indication is to relieve angina
- Also for prognostic reasons
- Usually performed immediately after angiogram
- Patients require anti-platelet agents
- Main problem has been restenosis and unsuitability of many lesions

COBALT CHROMIUM TECHNOLOGY

MULTI-LINK® Stents:

ML VISION® AND ML MINI VISION™

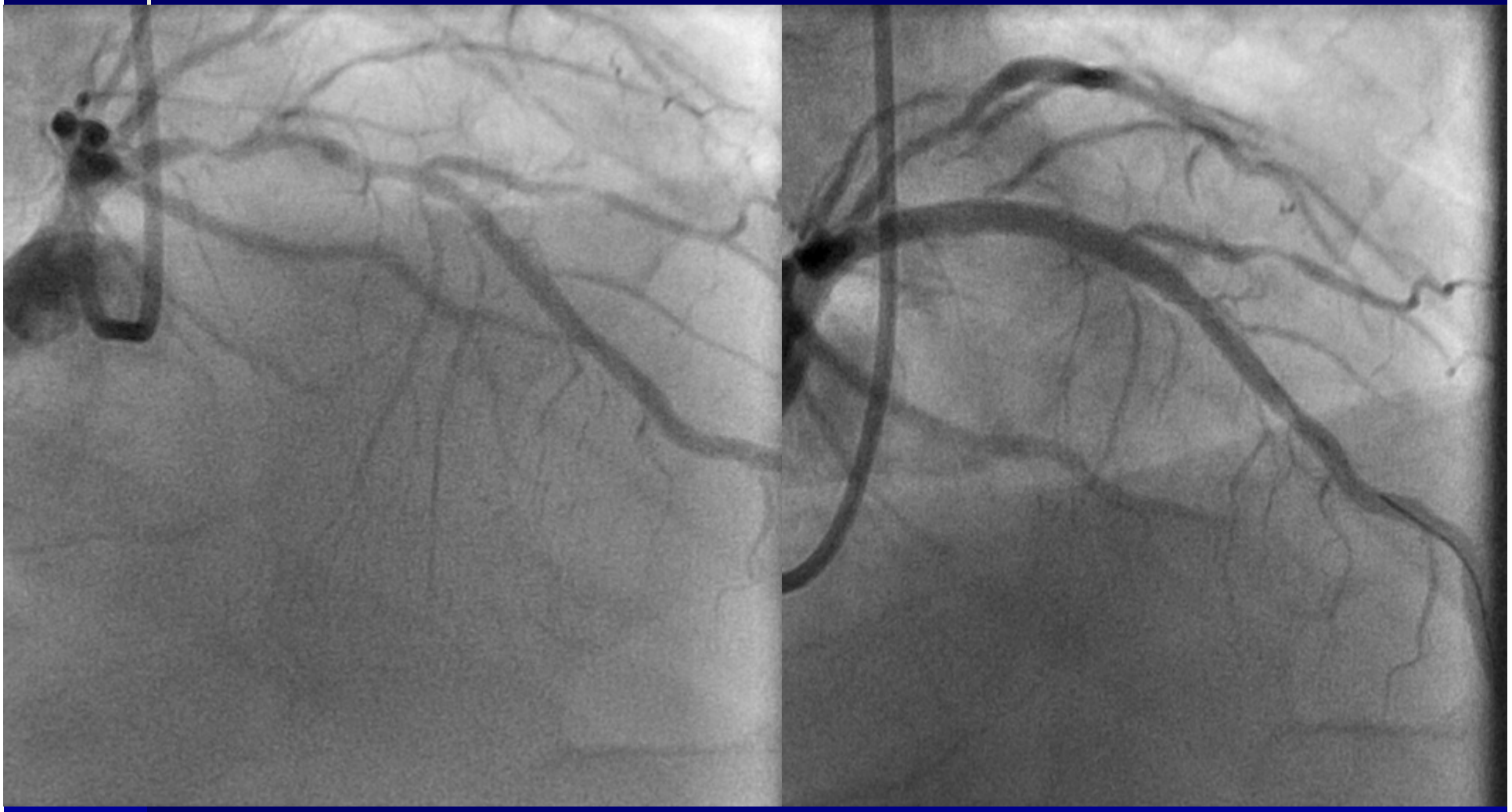


Advances in PCI

- Stenting
- Drug Eluting Stents
- Smaller and More flexible stents
- Distal protection devices

Most patients with IHD can be revascularised percutaneously now.

Complex Disease of LAD



Care after PCI

- Plavix should not be stopped except in extreme cases
- Recovery is fast
- Longer course of Plavix with drug eluting stents
- Minor chest discomfort common for after weeks.
- Can resume full activity within a week

B Blockers

- Reduce reinfarction
- Prevent silent ischaemia

- Generally should be used in most patients with IHD if they tolerate them
- Low threshold for stopping in patients with side effects if they have no angina, or are more than 1 year post infarction.

- Metoprolol versus Atenolol

ACE Inhibitors

- A number of studies show a prognostic benefit in patients with IHD
- Usually high doses have been used

- Many patients without contraindication given an ACE inhibitor
- Absolute indication in patients with EF of < 40%

Conclusions

- Diagnosis of coronary artery disease is difficult
- it pays to be cautious
- low threshold for performing coronary angiography if diagnosis is uncertain, or to establish the severity of disease
- Risk factor reduction the cornerstone to reduce IHD mortality.