Invited Experts' Case Presentation and 5-Slides Focus Review

FFR and IVUS in Myocardial Bridging

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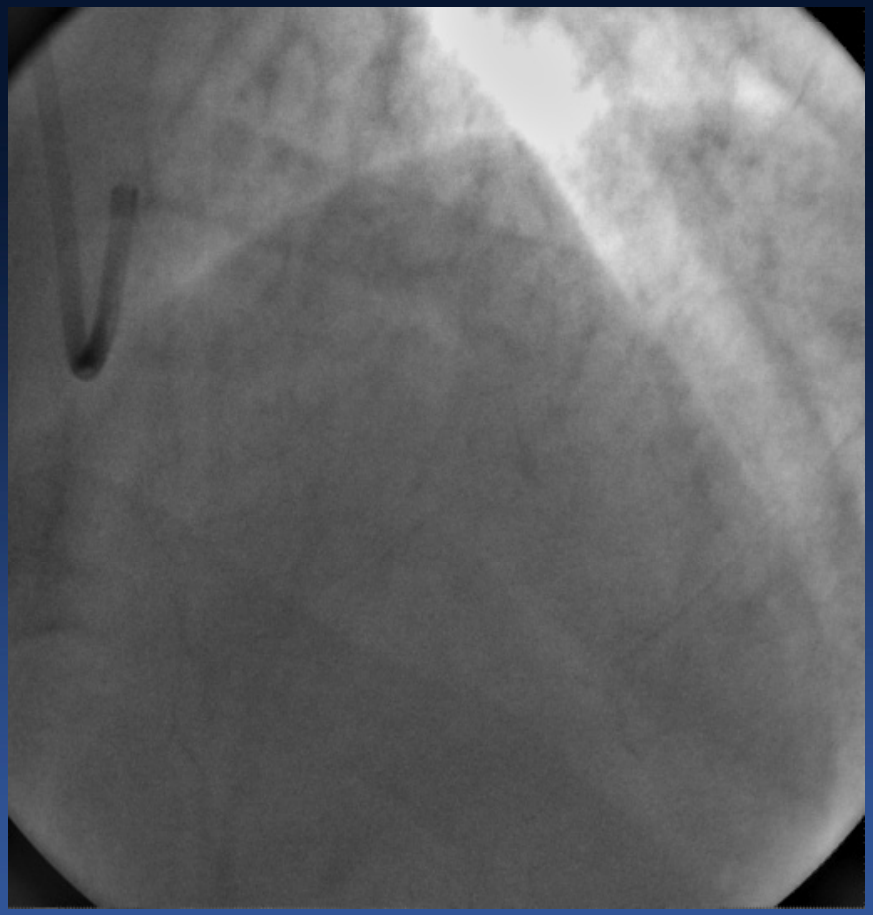
Myocardial Bridging



- **Common congenital coronary anomaly**

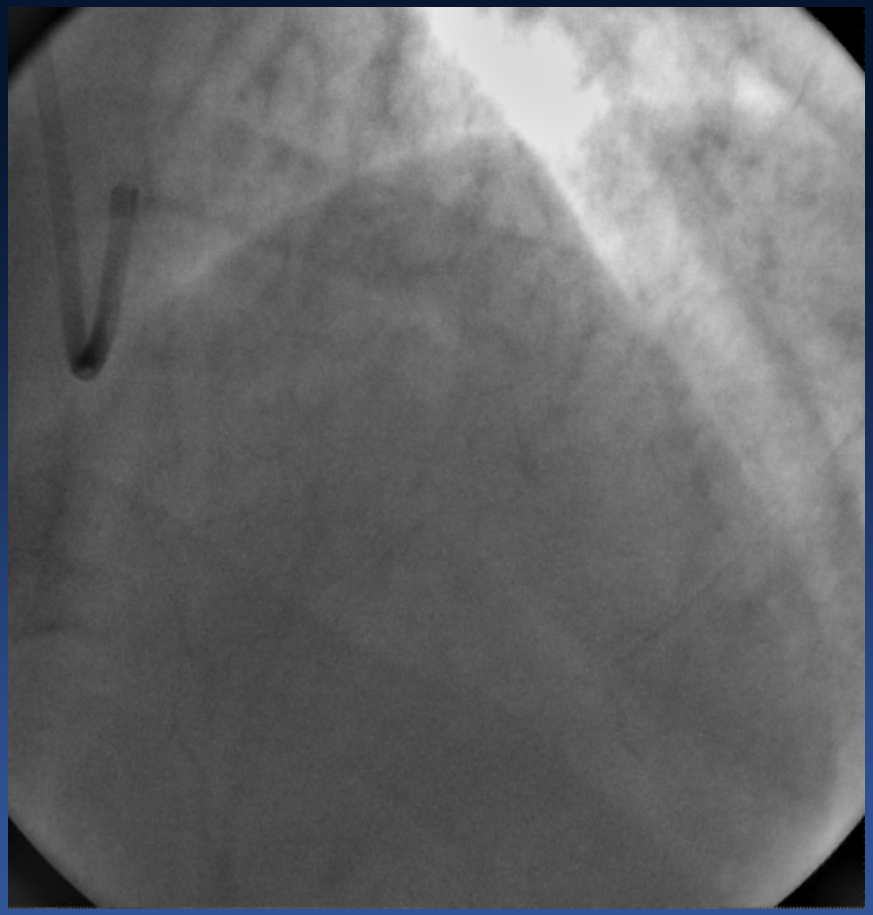
: segment of a major epicardial coronary artery runs intramurally.

: systolic narrowing, delayed diastolic relaxation→Induce ischemic heart disease.

- **Frequency varies from 0.5 - 33% by Coronary angiography.**

: In autopsy series : 15-85 %

Myocardial Bridging



- **Clinical relevance is debated**

: Harmless normal variant,

but may cause angina, MI, life-threatening arrhythmia and even sudden cardiac death.

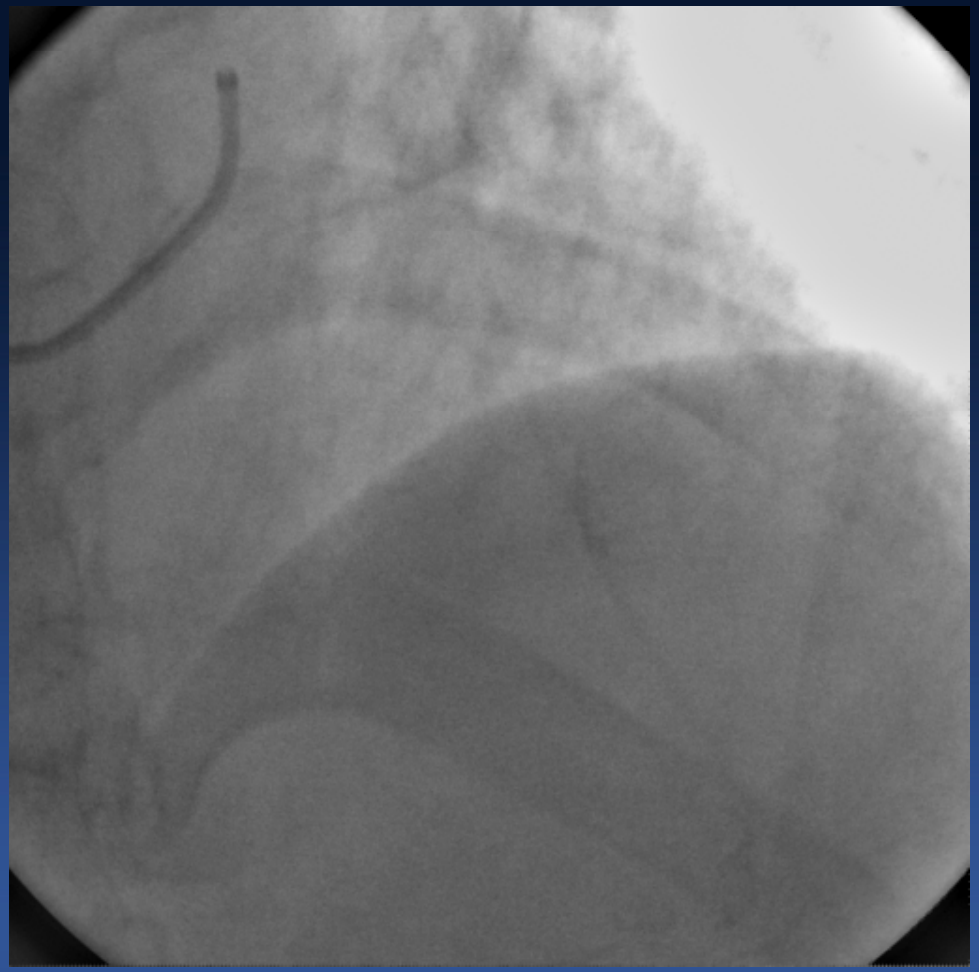
: No study for long term clinical prognosis of MB.

CASE 1.

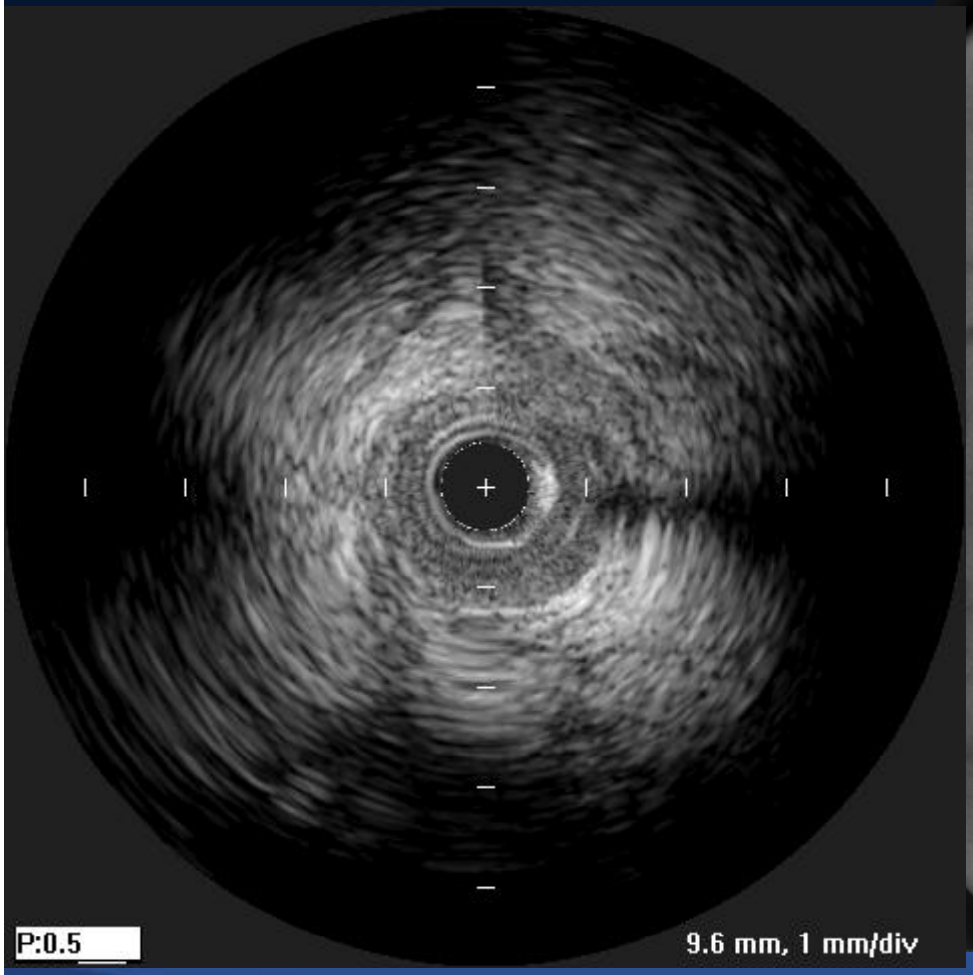
- 62/F
- Typical effort chest pain
- Thallium SPECT:

  Normal myocardial perfusion
- Treadmill test :

  Positive (at stage 4)



CASE 1.

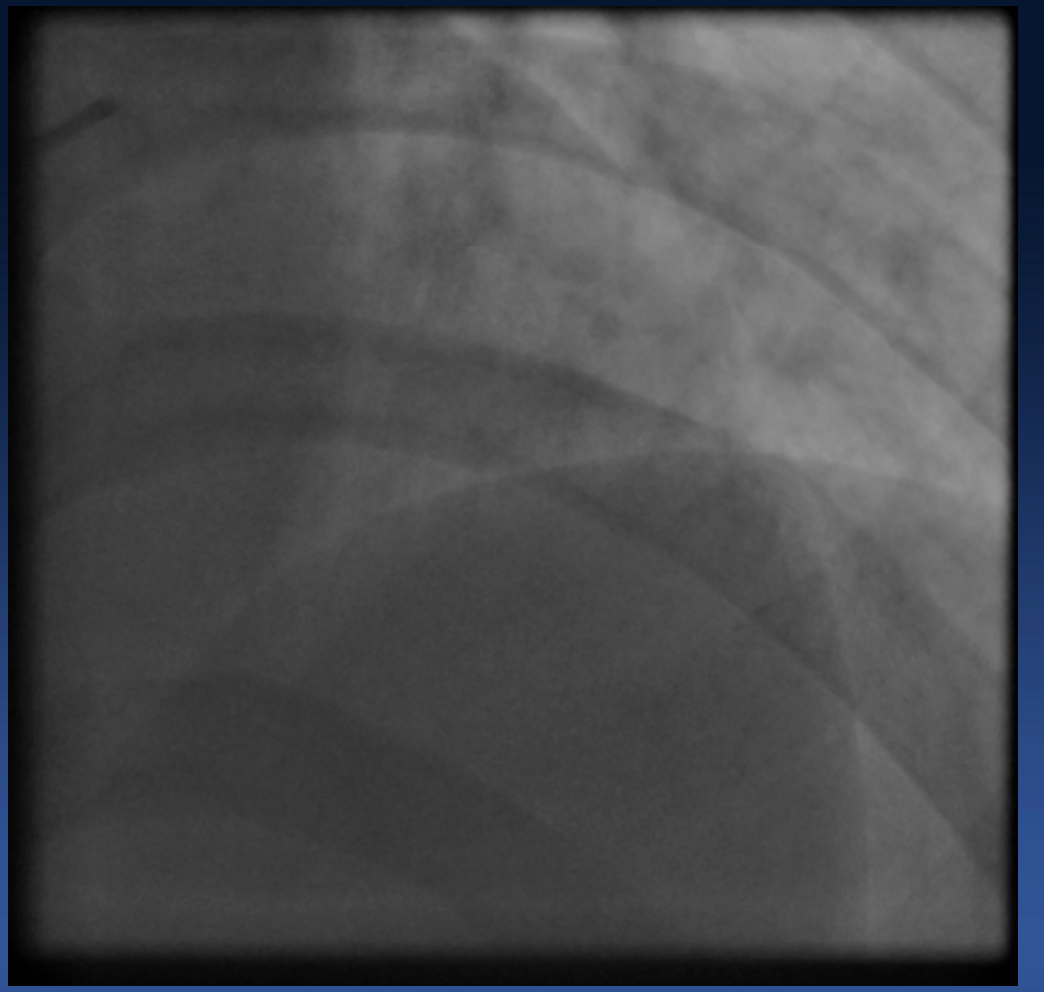


CASE 2.

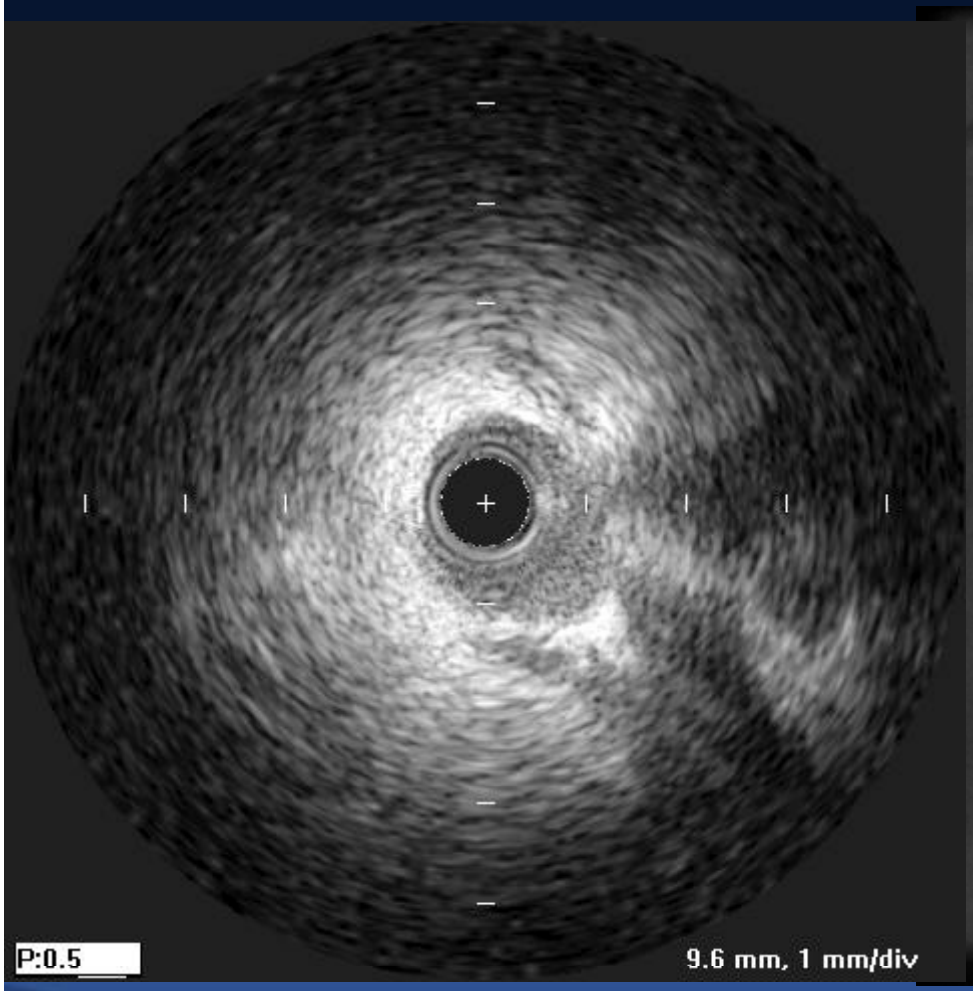
- 55/F
- Typical effort chest pain
- Thallium SPECT:

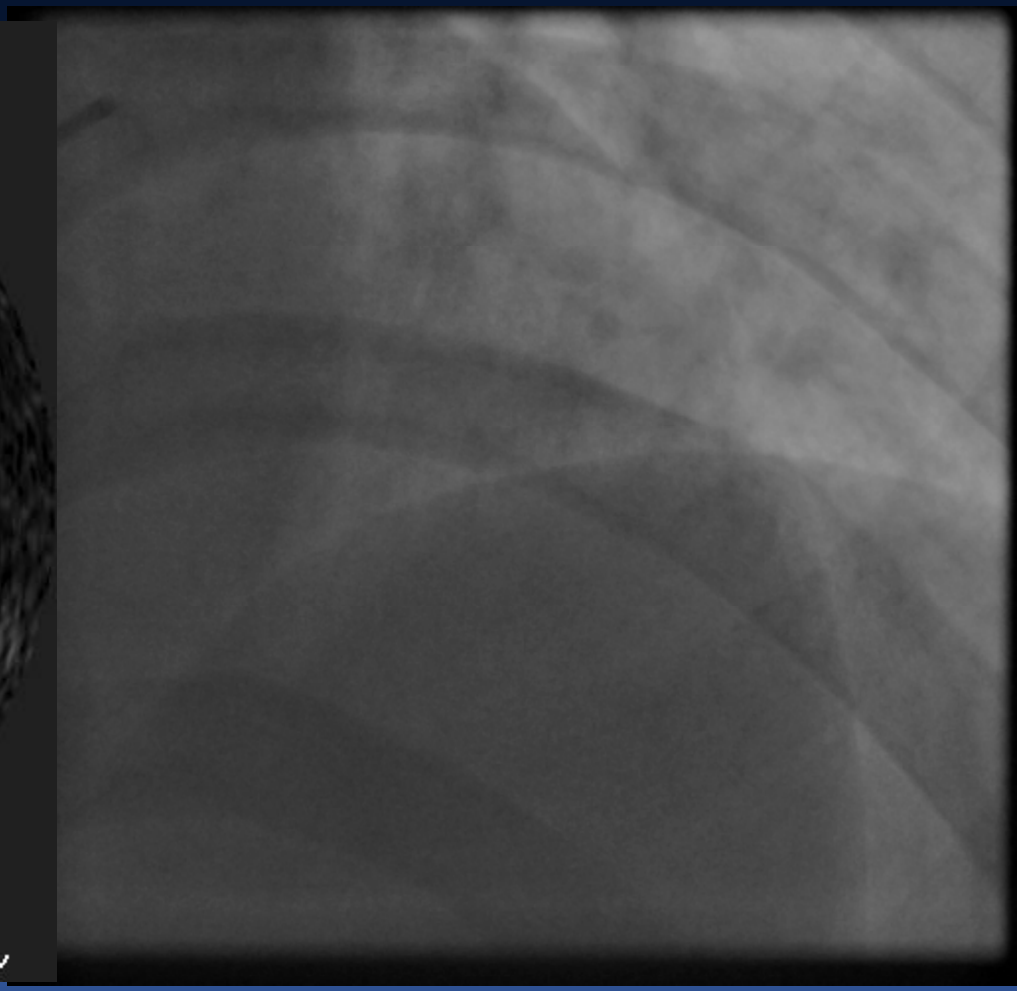
  Normal myocardial perfusion
- Treadmill test :

  Negative



CASE 2.





Myocardial bridging is generally believed to be a benign disease…

1. Can we reassure these patients confidently ?

2. Treatment options ?

   Medical treatment vs. Revascularization (Stenting or Surgery)

Myocardial bridging is not a benign variation of coronary anatomy

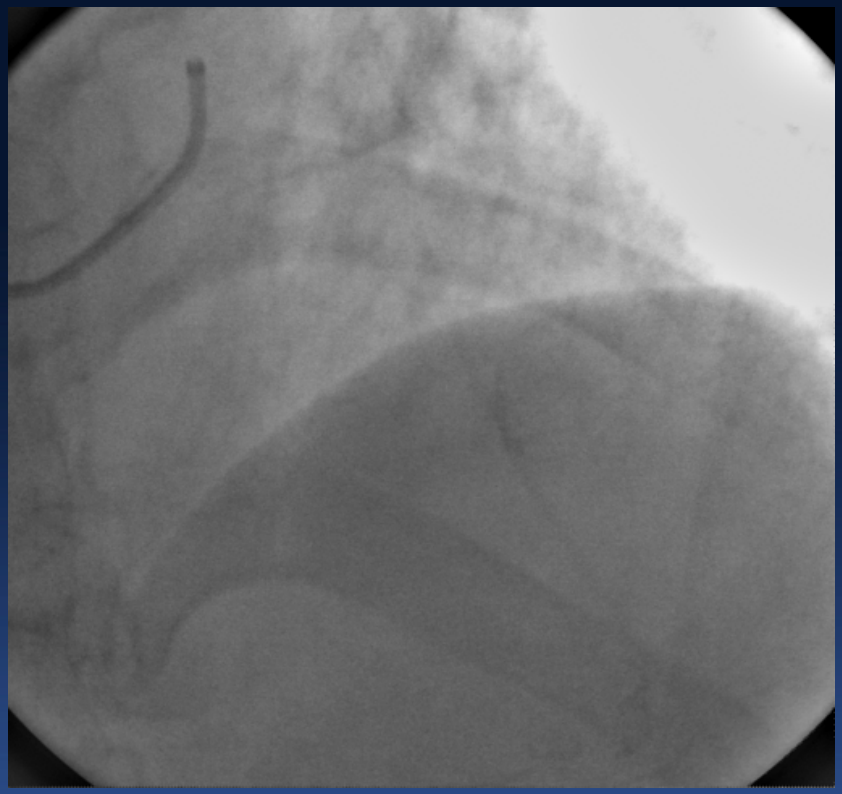
- Retrospective review :2002 -2005 (Follow up duration: 12±2 months)
- 226 patients (1·57%) were symptomatic isolated myocardial bridging.
- Group I (< 50% systolic compression), Group II (50–70%), Group III (≥ 70%).

Can we evaluate the physiologic severity of MB with FFR ?

Can we predict the prognosis of the patients with MB ?

F. Mookadam et al. Eur J Clin Invest 2009; 39 (2): 110–115

CASE 1



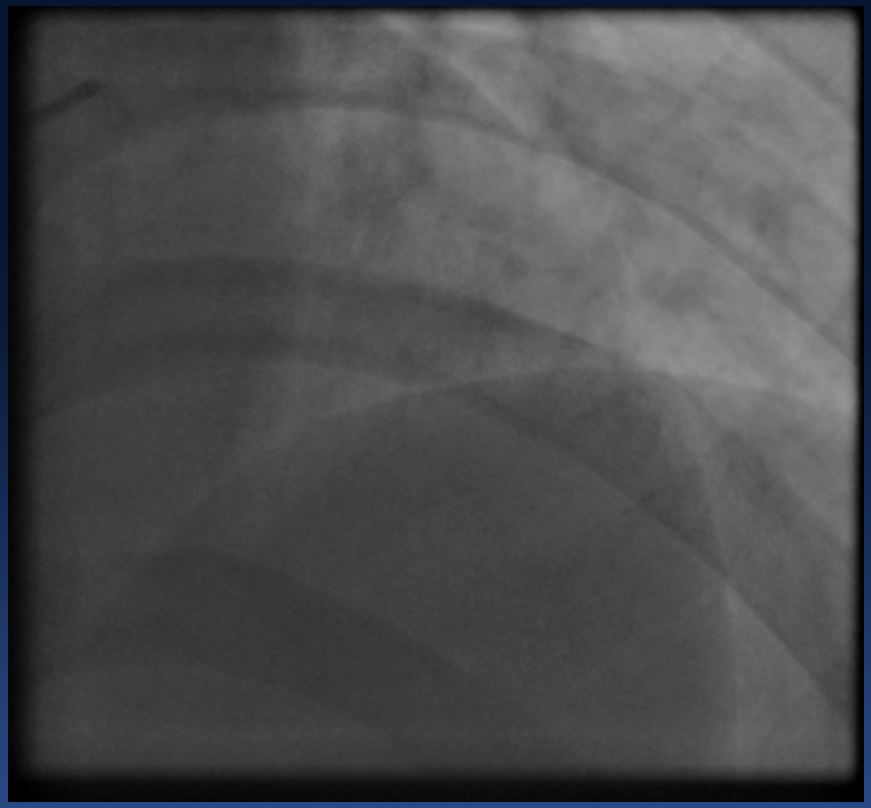
Effort chest pain

Thallium SPECT : Normal

TMT : Positive at stage 4

FFR : 0.84

CASE 2



Effort chest pain

Thallium SPECT : Normal

TMT : Negative

FFR : 0.87

Adequate identification of Myocardial bridging?

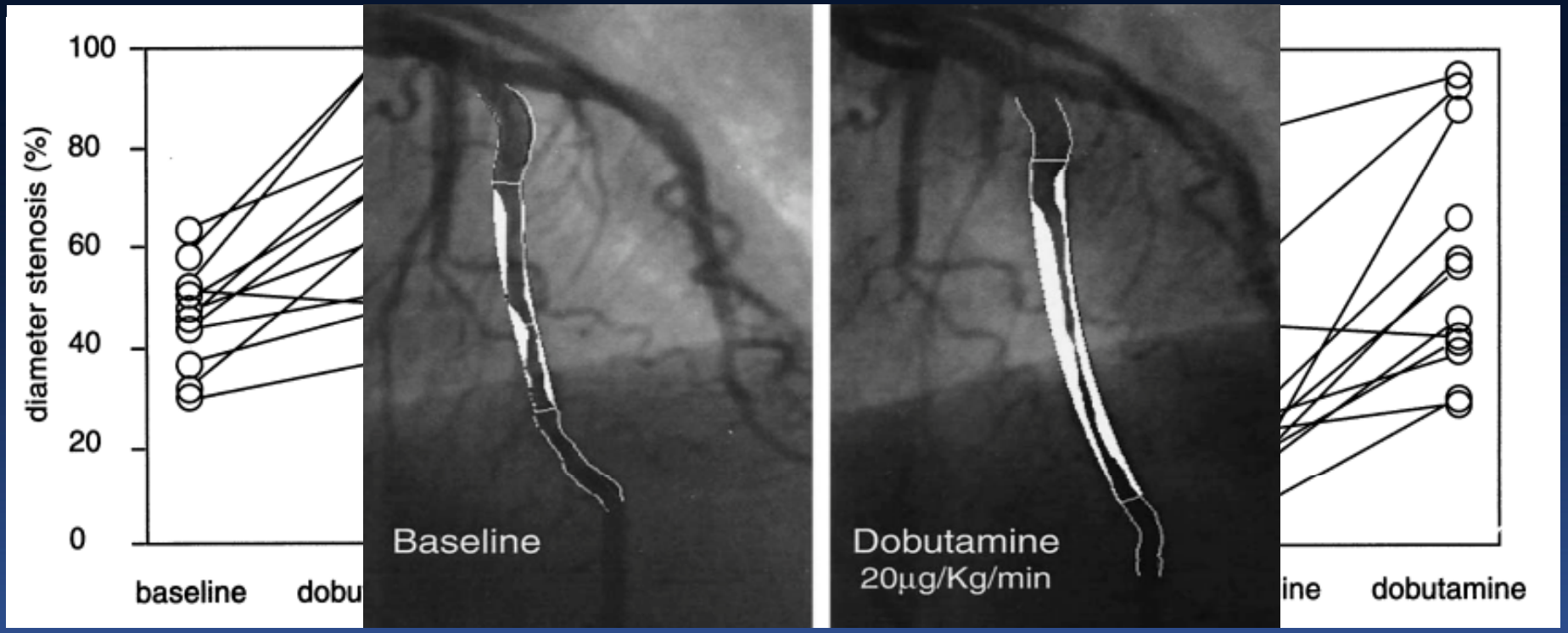
- Dynamic stenosis :
  - Degree of extravascular compression
  - Intra-myocardial tension (contractility)

- In rest conditions :

  might leave un-identified the hemodynamic relevance.

(Ischemia only during exercise / situations of increased inotropism)

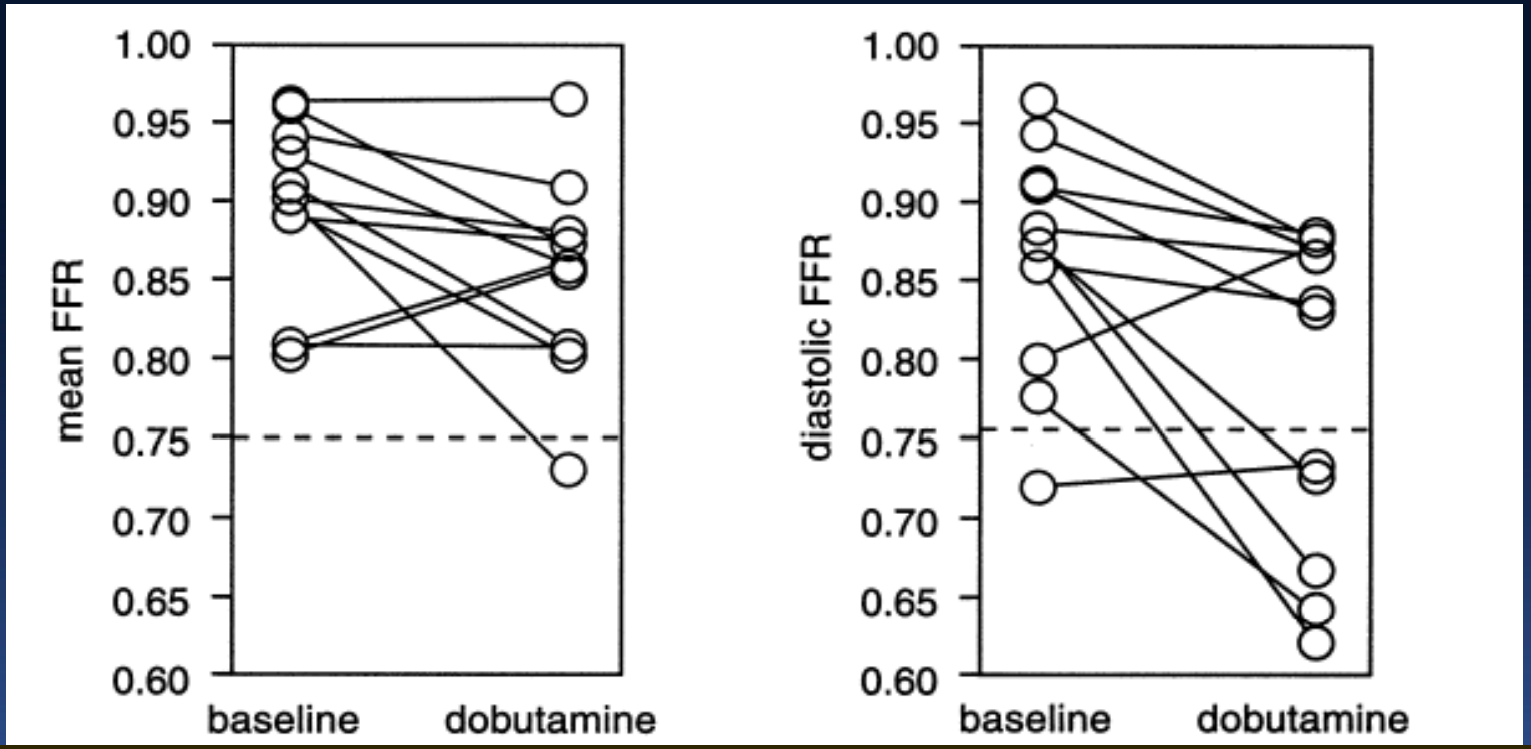
Dobutamine Challenge in Physiologic Assessment of MB



46.1±10.5 → 68.7±17.9% (p<0.0001)	1.5± 0.4 → 0.8± 0.4mm (p=0.001)	12.4 ± 9.1 →24.0±9.2 mm (p=0.0005)

Javier Escaned et al. J Am Coll Cardiol 2003;42:226 –33

Importance of Diastolic FFR and Dobutamine Challenge in Physiologic Assessment of MB



The “milking” of blood in the compressed epicardial segment against systole

- Premature overshooting of intracoronary over aortic pressure
- Negative systolic pressure gradient across the MB.
- Diastole FFR avoids the influence of systolic negative intracoronary Pr.
- Allows quantification of the effect of the MB

CASE 1

Thallium SPECT : Normal

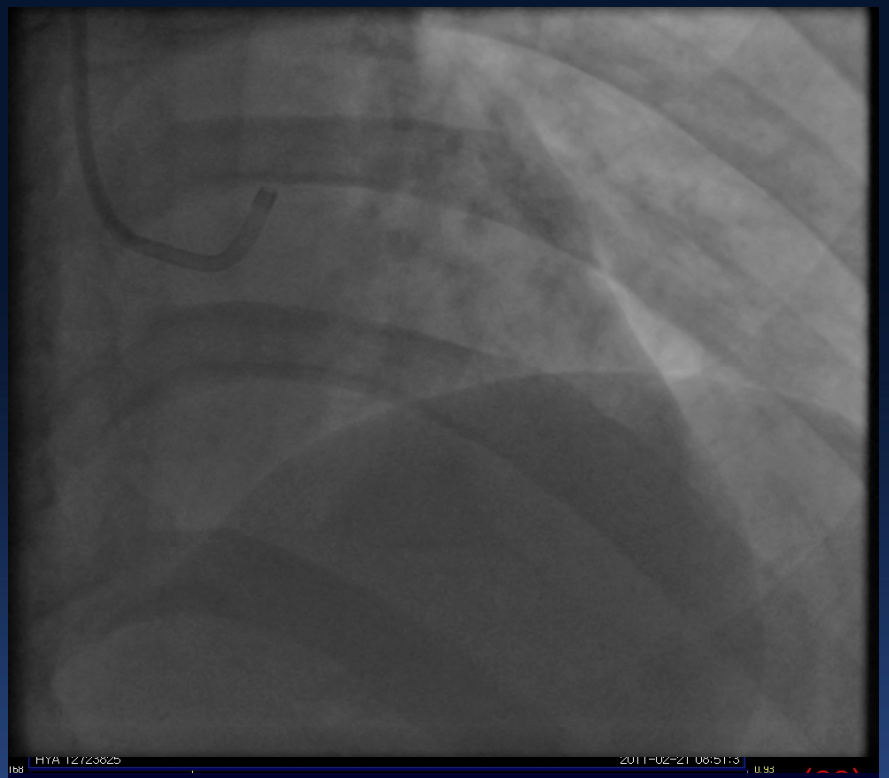
TMT : Positive at stage 4

FFR : 0.84

Dobutamine FFR : 0.81

Diastole Dobutamine FFR: 0.74

CASE 2



Thallium SPECT : Normal

TMT : Negative

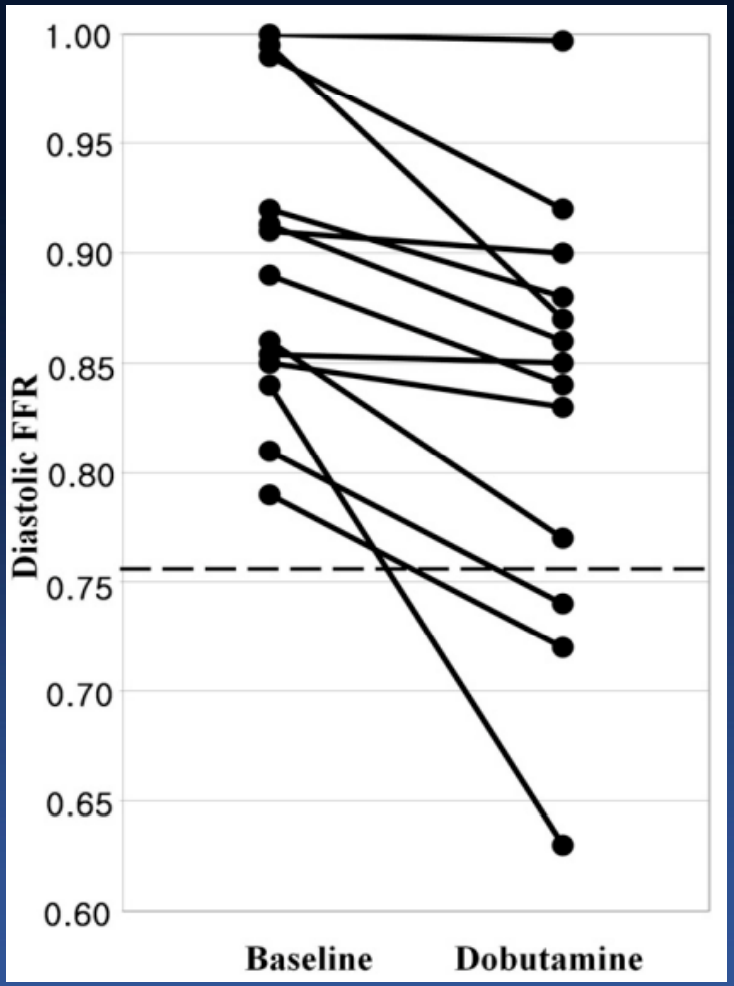
FFR : 0.87

Dobutamine FFR : 0.87

Diastole Dobutamine FFR : 0.84

Are there differences of prognosis between the two patients?

Clinical Follow-up of isolated MB patients



14 patients
median follow-up:54 months (30-74m)

1 patient died from femur fracture

2 patients underwent TLR
(1 patient: PCI, initial FFR <0.75,
1 patient: CABG, diastolic FFR >0.76)

11 patients : free of symptom after Meds

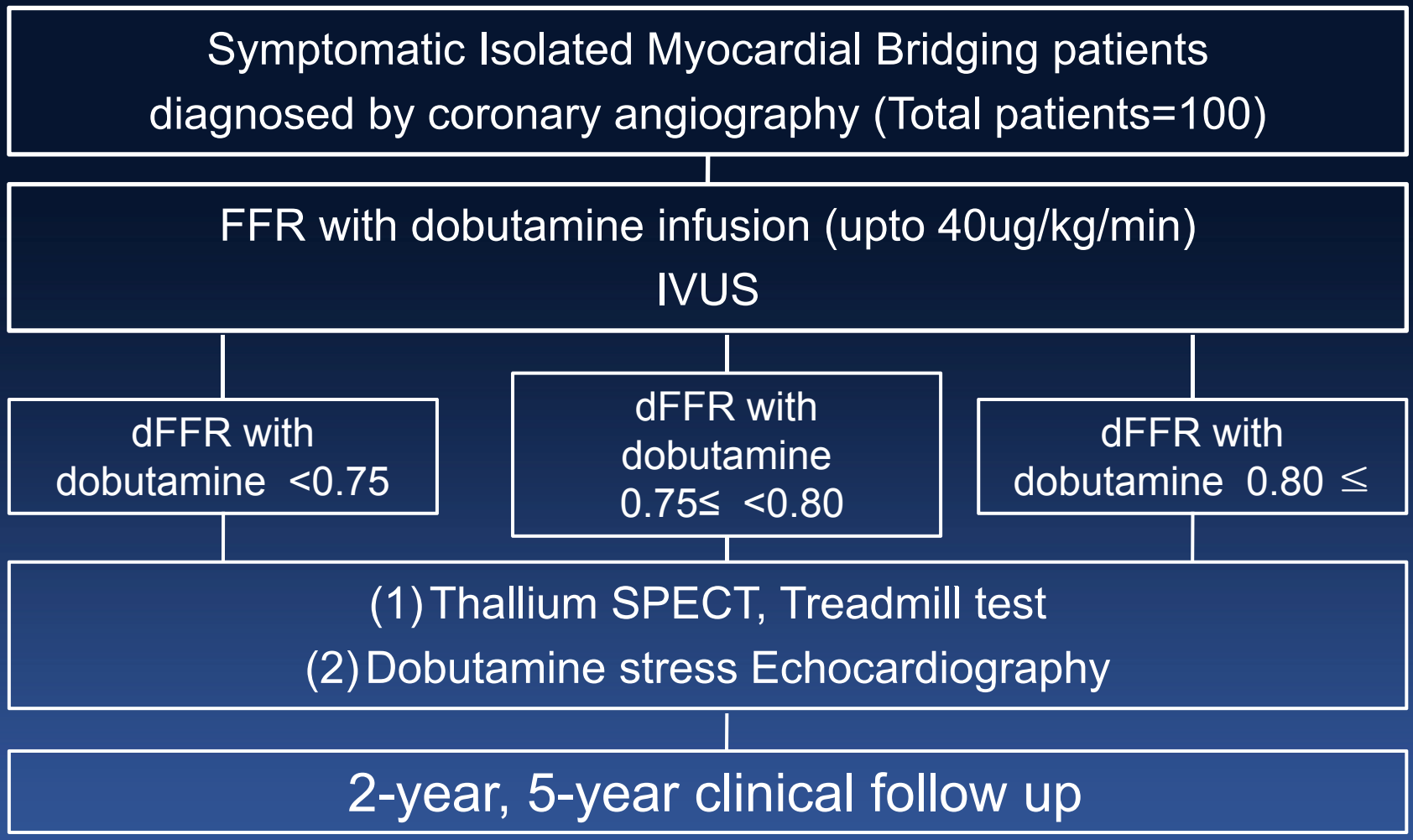
Kyungil Park et al, Canadian Journal of Cardiology 27 (2011) 596–600

We need more study to prove…

- Evaluation of clinical prognosis in Myocardial bridging according to functional significance using diastolic FFR with dobutamine.

- Evaluation of concordance between diastole-FFR and other non-invasive stress test (TMT, Thallium SPECT, Dobutamine Echo)

STUDY PROTOCOL in AMC



End point : Re-admission, Intractable chest pain with medication, MI, TLR, Life- threatening arrythmia, cardiac death