# The value of FFR and iFR in characteristic cases: Myocardial bridge

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# Case presentation: Myocardial bridge

Case : 71 y.o. Male Past history: none

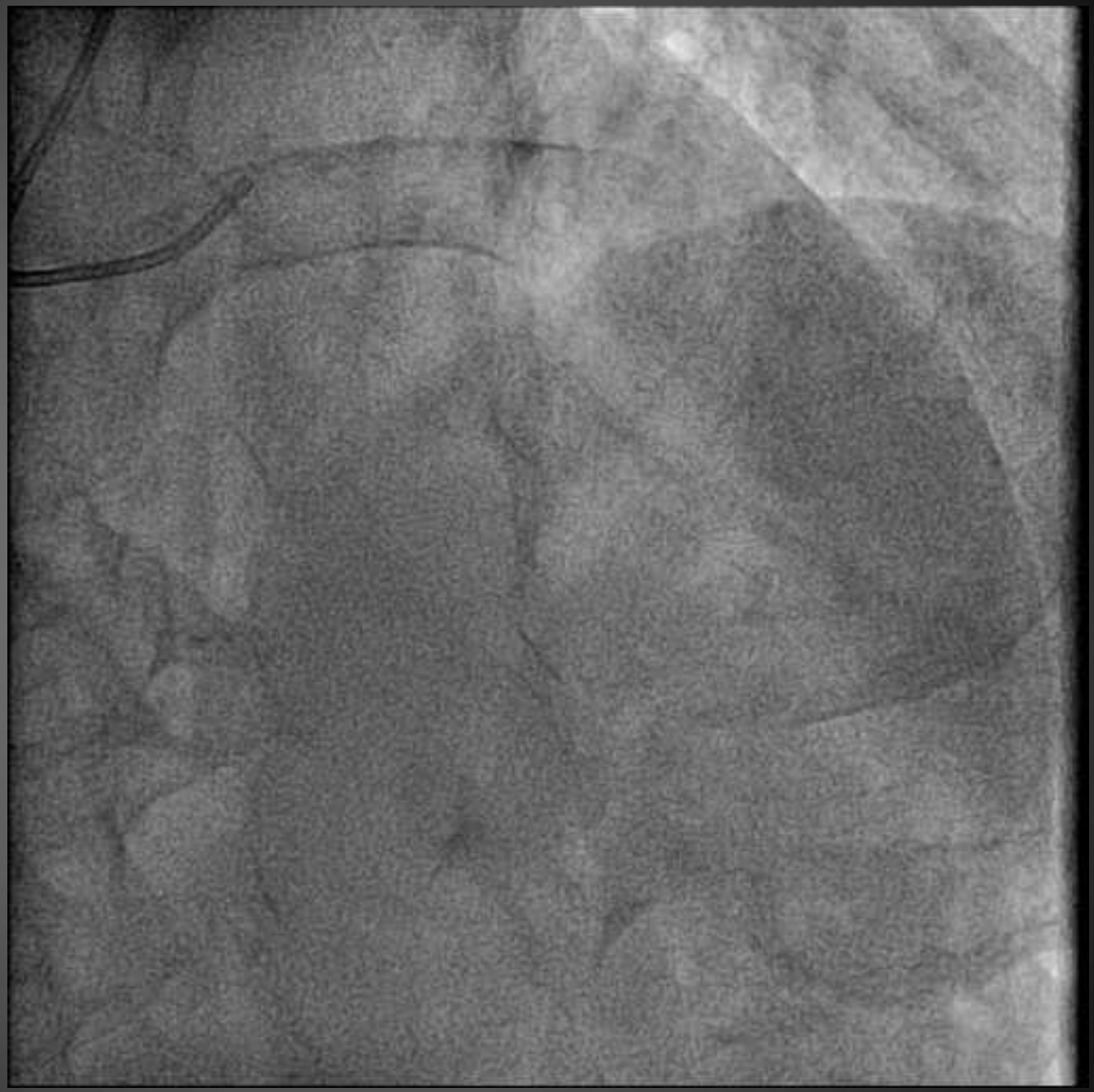
Symptom: Post AMI (no symptom)

Coronary risk factors: HTN, HL

Medical history: A percutaneous coronary intervention was performed for an acute myocardial infarction of the LCX in this patient. A moderate stenosis in LAD was observed at that time. A physiological study was performed before discharge.

110/60mmHg, Cre 0.71 mg/dl, EF=41%, LVDd=47mm

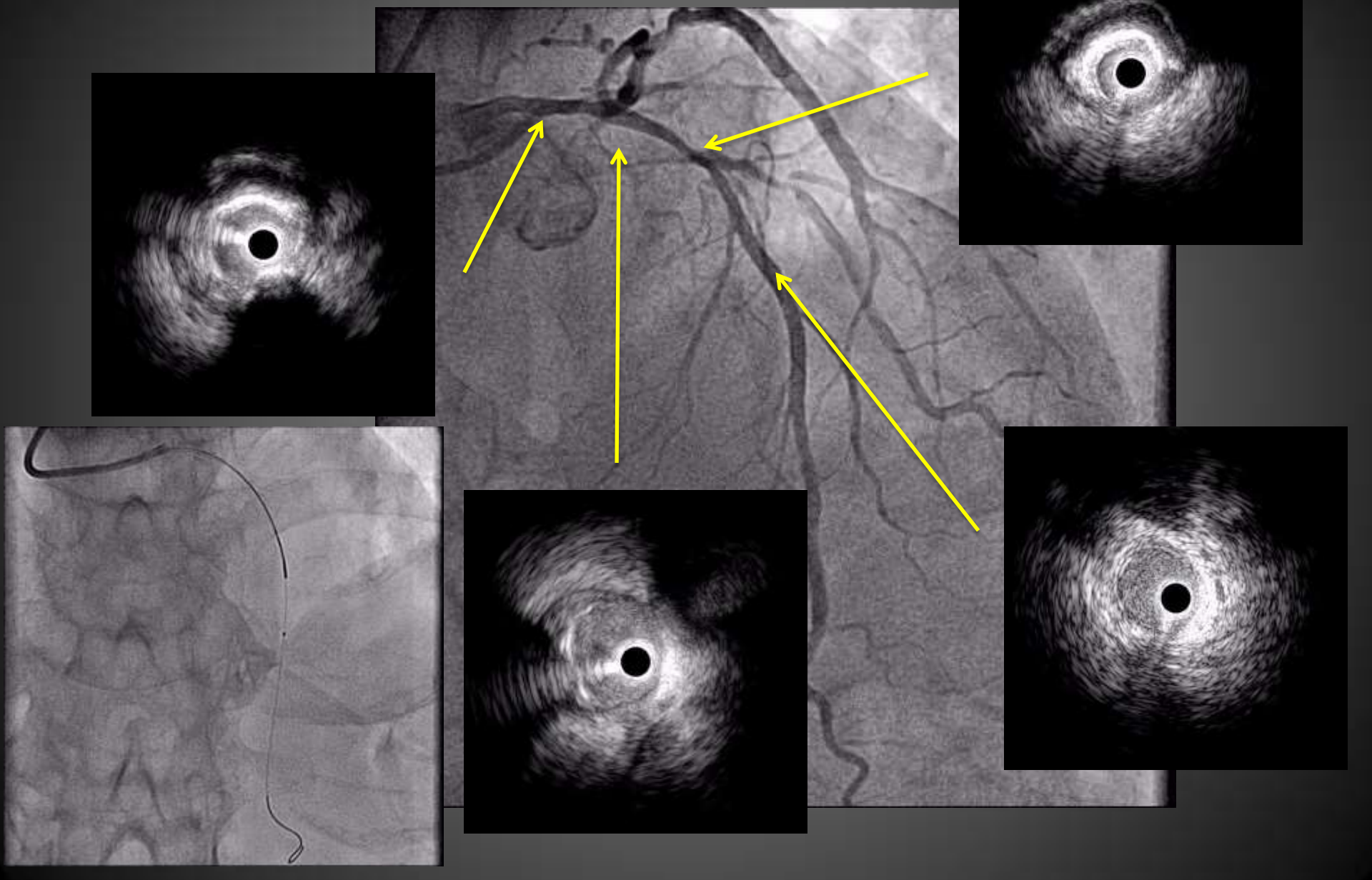
# CAG



iFR=0.81

FFR=0.63

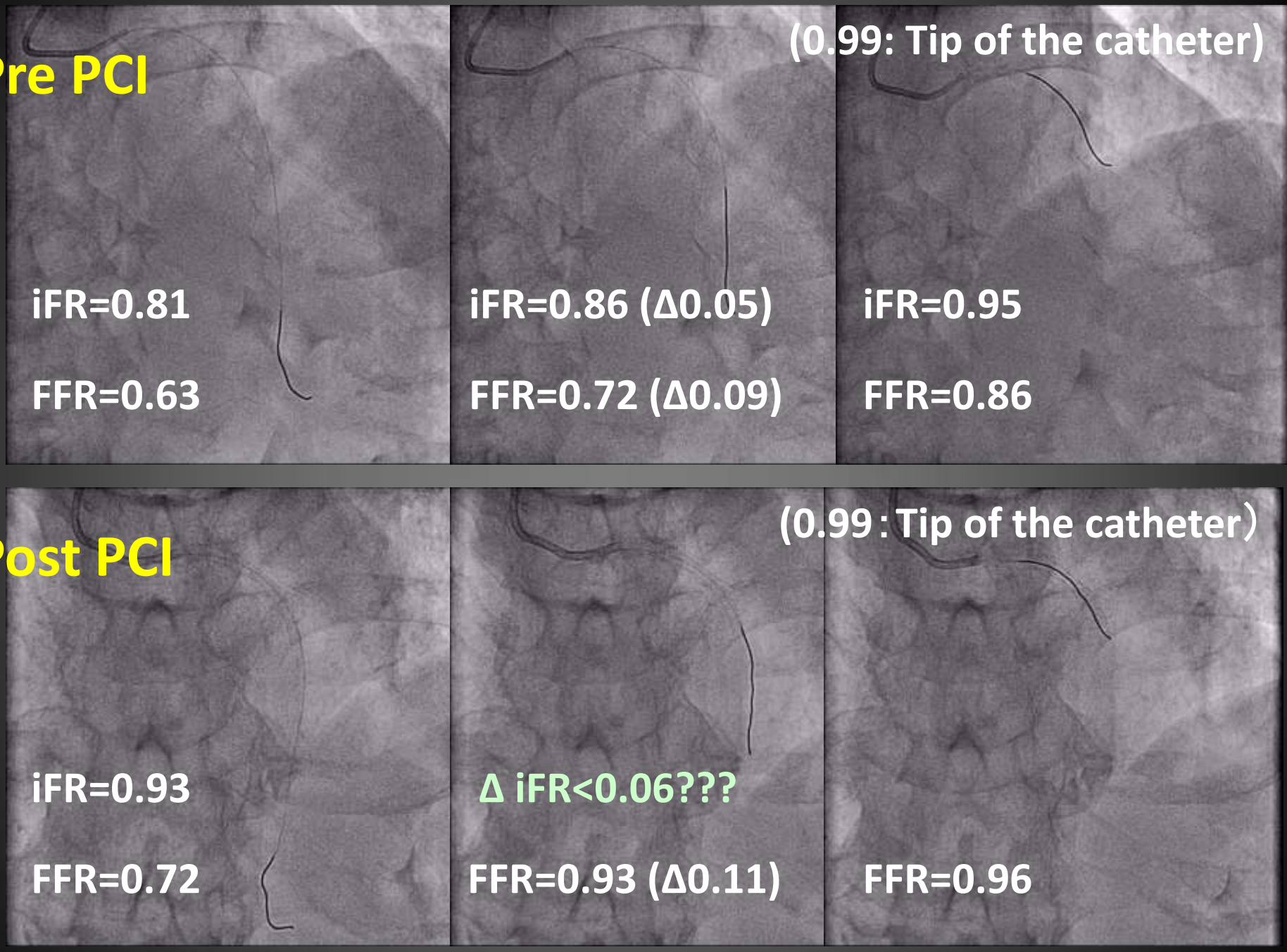
# Pre IVUS



# CAG after stenting

iFR=0.91

FFR=0.72

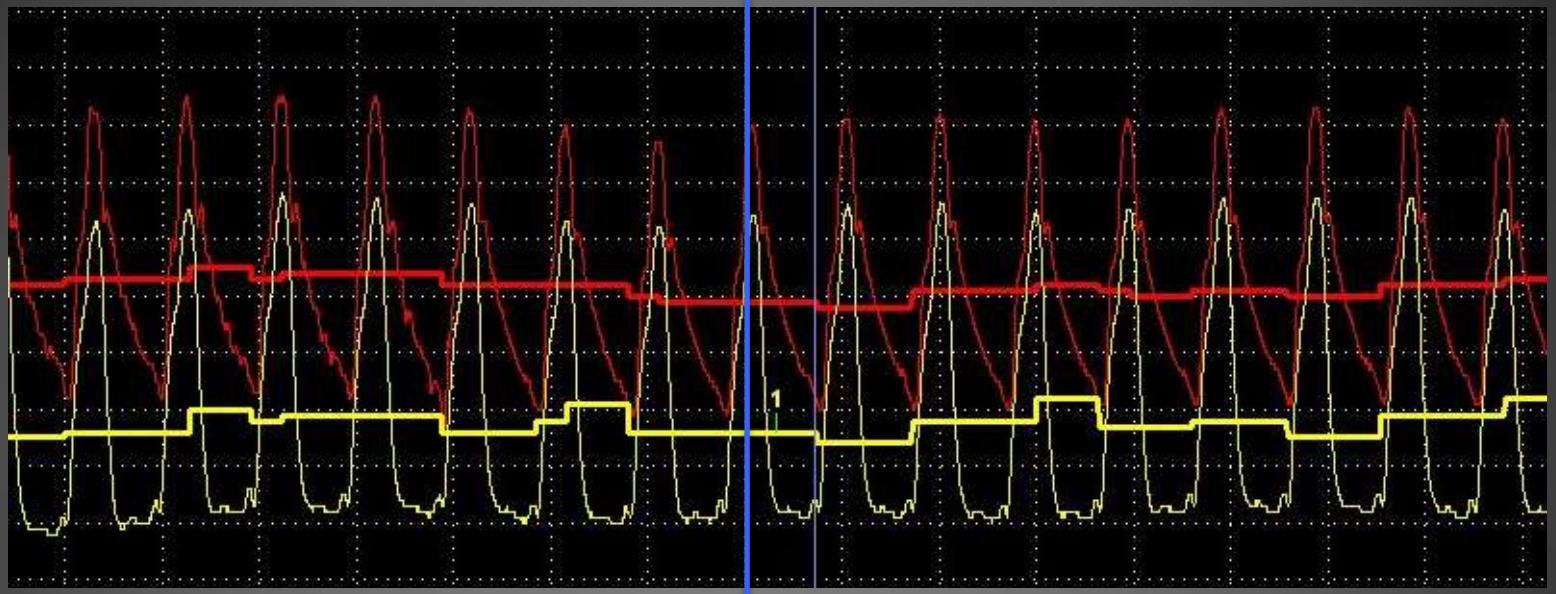

Pre PCI
(0.99: Tip of the catheter)
iFR=0.81
FFR=0.63
iFR=0.86 (Δ0.05)
FFR=0.72 (Δ0.09)
iFR=0.95
FFR=0.86
Post PCI
(0.99：Tip of the catheter)
iFR=0.93
FFR=0.72
Δ iFR<0.06???
FFR=0.93 (Δ0.11)
FFR=0.96

# Pre PCI

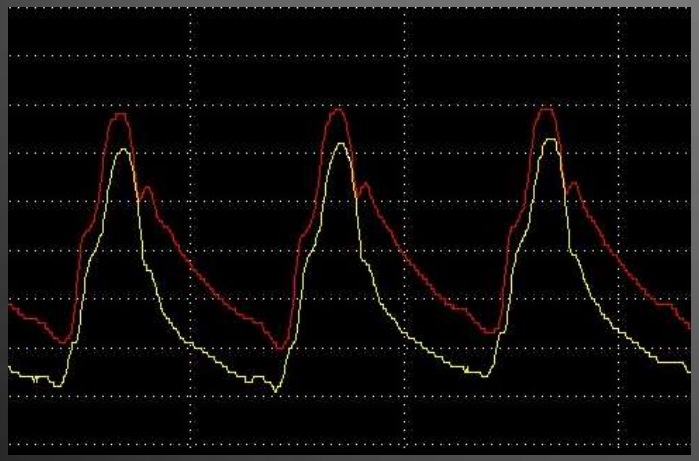
Bridge distal

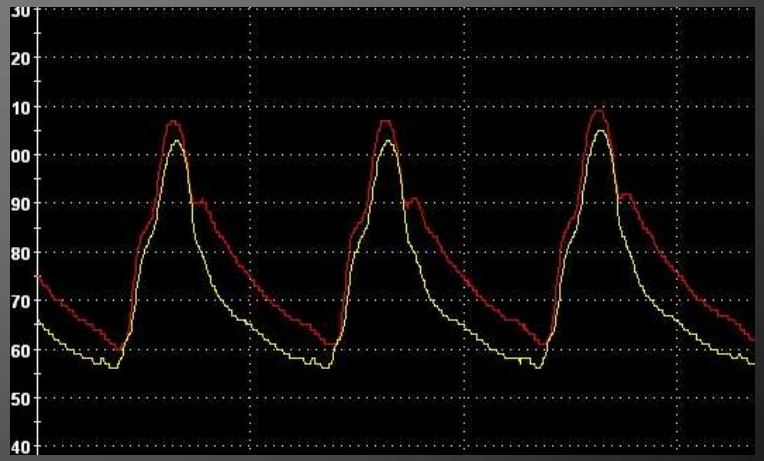
Bridge proximal

**FFR**



**iFR**



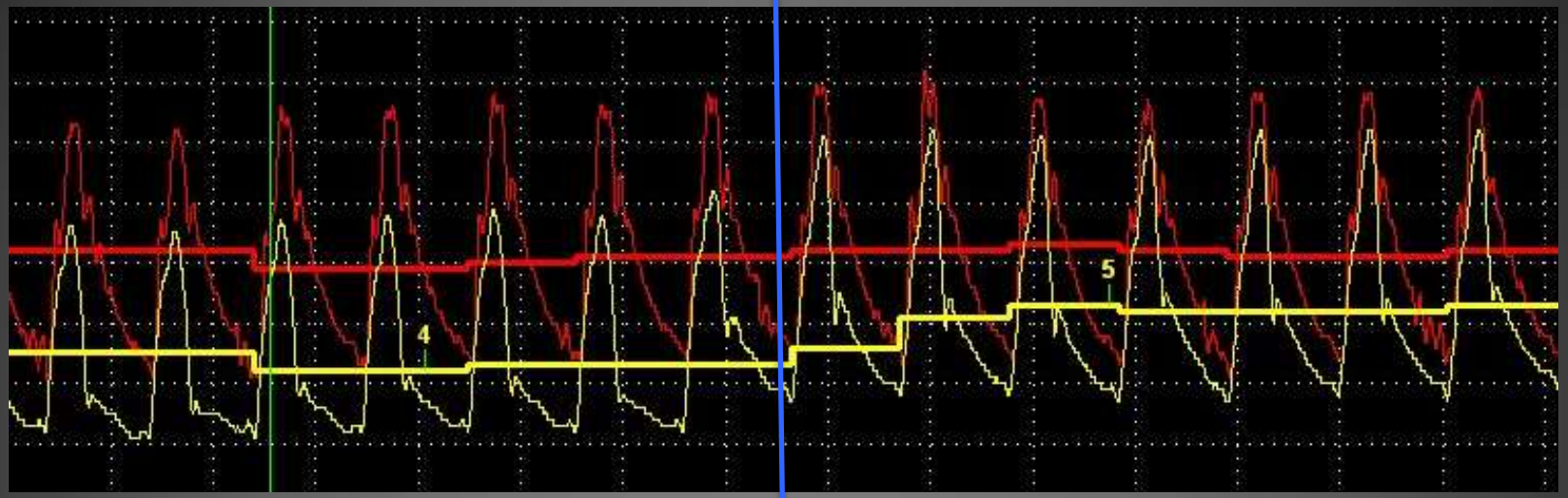


# Post PCI

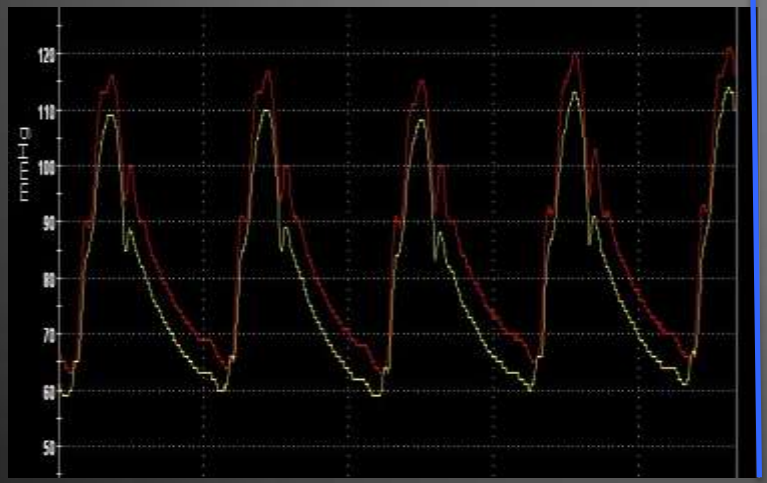
Bridge distal

Bridge proximal

**FFR**




**iFR**




Bridge distal

# The flow pattern of Myocardial bridging

The characteristic flow pattern of myocardial bridging is an abrupt flow acceleration in early diastole, followed by immediate deceleration and subsequent plateau of mid-to-late diastolic flow. Systolic flow is reduced, absent or even retrograde, and these sudden changes in flow velocities cause secondary fluid waves, which in turn are responsible for the nonlaminar blood flow in myocardial bridging

Inder et al reported the case of no symptoms and a normal stress test, but an abnormal FFR value across the myocardial bridging. He raised the concern about the assessment of ischemia using FFR in patient with myocardial briding

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# Summary

- We experienced a discordant result between the value of iFR and FFR in a lesion with severe myocardial bridge emerged after the treatment
- The discrepancy might be due to the difference of the data source (mean blood pressure and wave-free period) between iFR and FFR
  The clinical meaning of this discordance should be clarified with more cases using other modalities such as SPECT


Thank you for your attention!

# Myocardial bridging

- The incidence is 15-85% at pathological examination
- The incidence is 0.5-2.5% at angiographical examination
- Can be associated with myocardial ischemia, ventricular tachycardia, conduction disturbances, myocardial infarction, variant angina, and sudden death
- Both BMS (75%) and DES (25%) showed a high restenosis ratio when used for the treatment of ischemia caused by myocardial bridging

# Coronary flow pattern

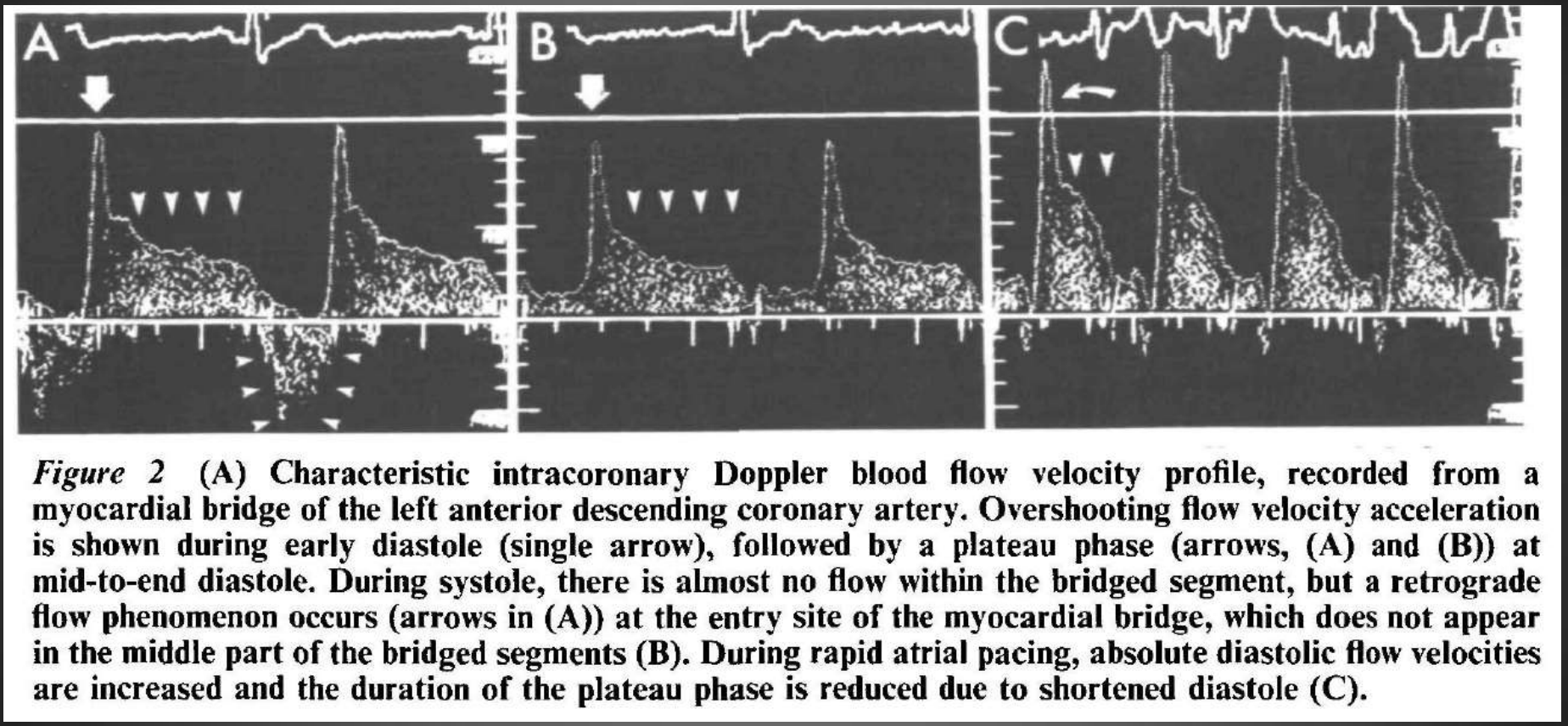
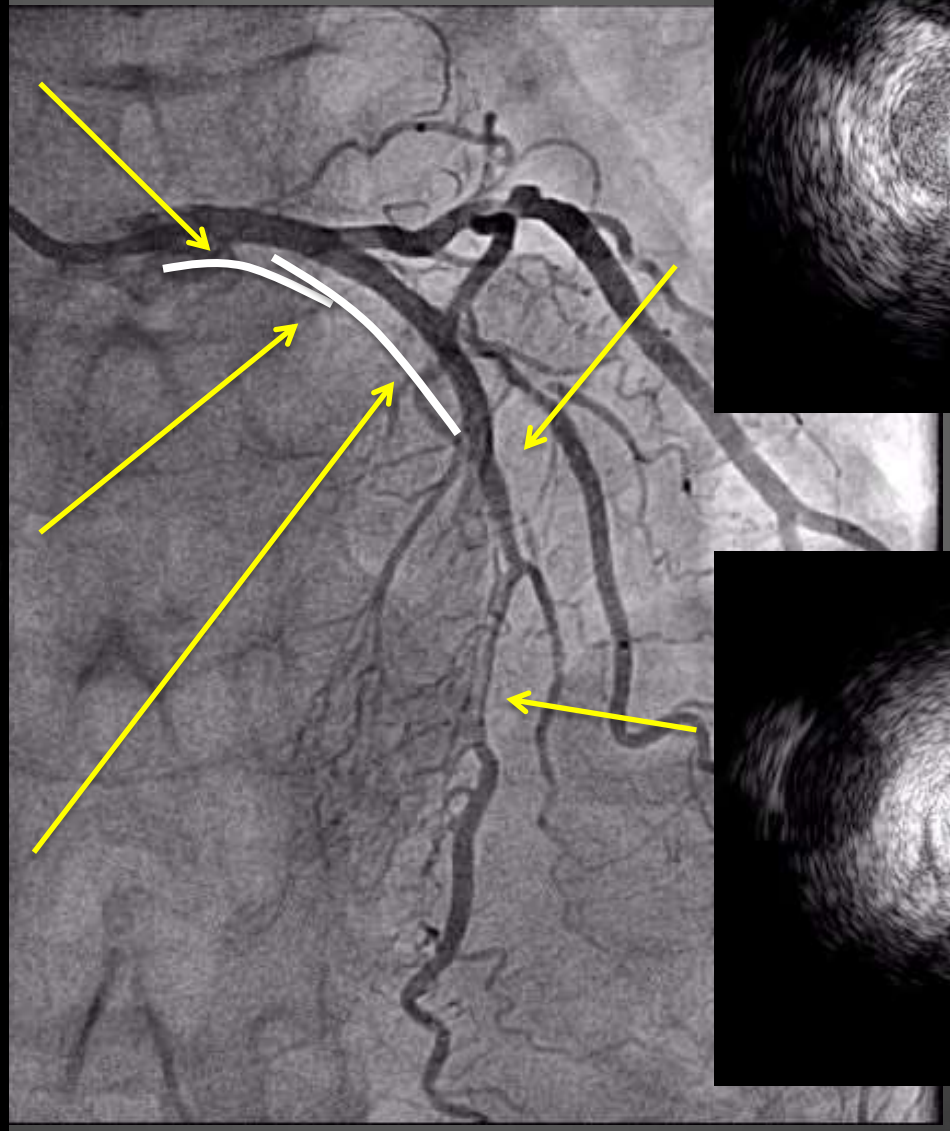
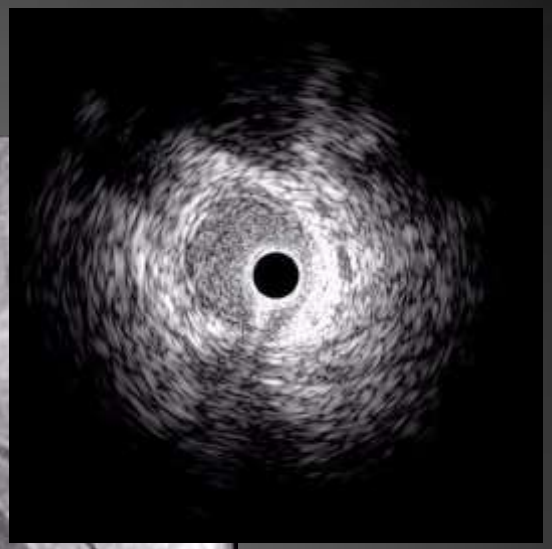


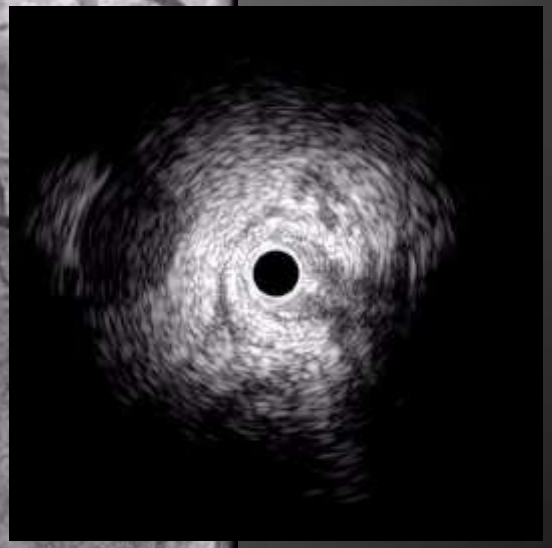

*Figure 2* (A) Characteristic intracoronary Doppler blood flow velocity profile, recorded from a myocardial bridge of the left anterior descending coronary artery. Overshooting flow velocity acceleration is shown during early diastole (single arrow), followed by a plateau phase (arrows, (A) and (B)) at mid-to-end diastole. During systole, there is almost no flow within the bridged segment, but a retrograde flow phenomenon occurs (arrows in (A)) at the entry site of the myocardial bridge, which does not appear in the middle part of the bridged segments (B). During rapid atrial pacing, absolute diastolic flow velocities are increased and the duration of the plateau phase is reduced due to shortened diastole (C).

E. R. Schwarz et al. European Heart Journal 1997: 18; 434-442

# Final IVUS







# CAG after stenting