
FFR in Left Main Disease

William F. Fearon, MD

Professor of Medicine

Director, Interventional Cardiology

Stanford University



Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest /arrangement or affiliation with the organization(s) listed below

Affiliation/Financial Relationship

Grant/ Research Support:

Company

St. Jude Medical
Medtronic

Consulting Fees/Honoraria:

Medtronic
HeartFlow
Cathworks

Major Stock Shareholder/Equity Interest:

Royalty Income:

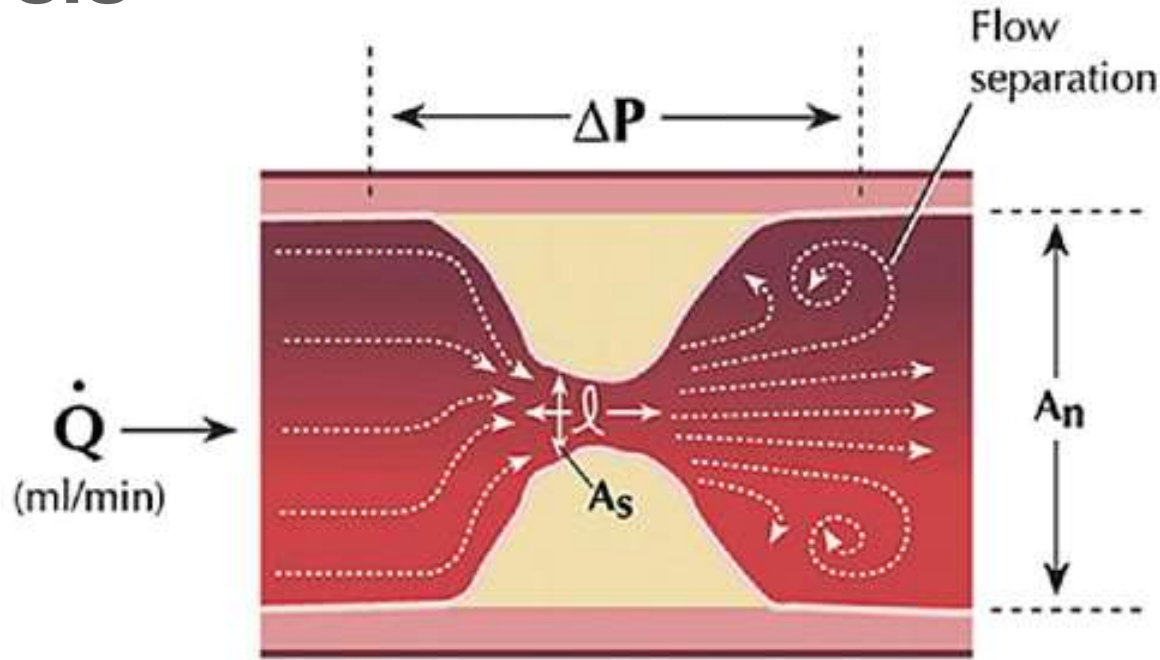
Ownership/Founder:

Salary:

Intellectual Property Rights:



Factors impacting ischemic potential of a stenosis

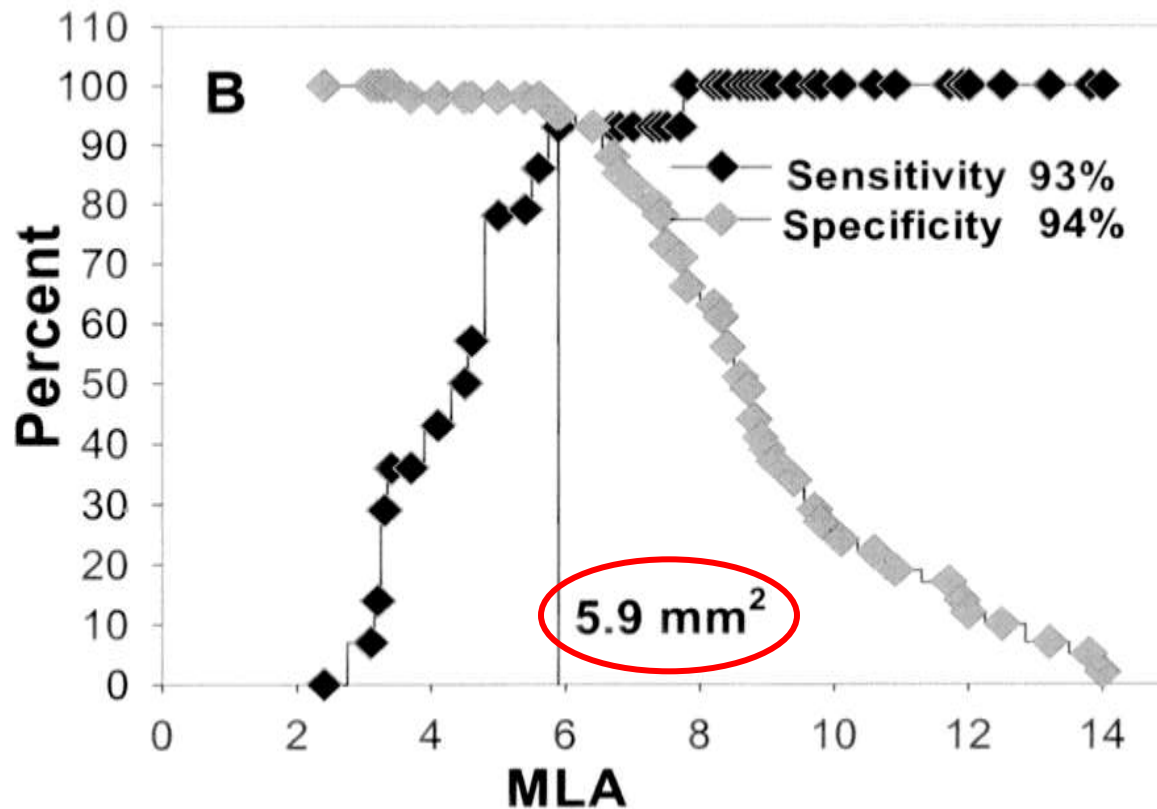


$$\Delta P = \underbrace{f_1(1/A_s^2, \ell, \dot{Q})}_{\text{Viscous}} + \underbrace{f_2(1/A_s^2, 1/A_n^2, \dot{Q}^2)}_{\text{Separation}}$$



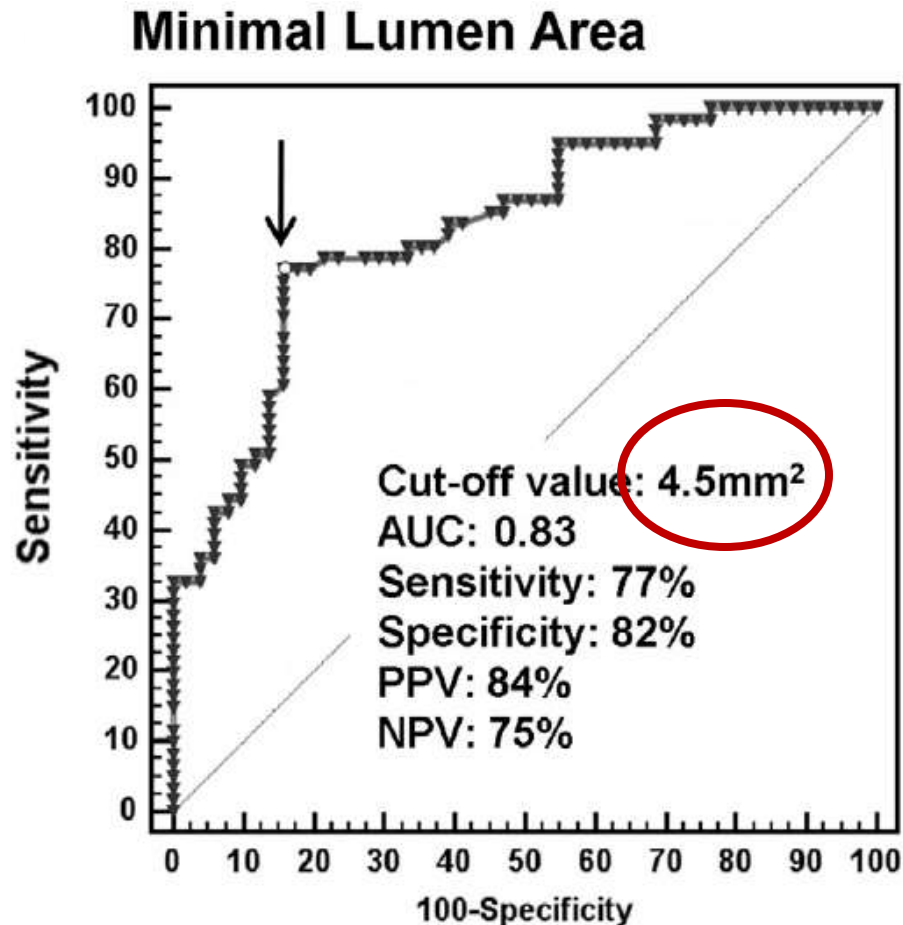
Variability of IVUS Cutoff Values

55 patients with ambiguous left main disease and IVUS compared to FFR



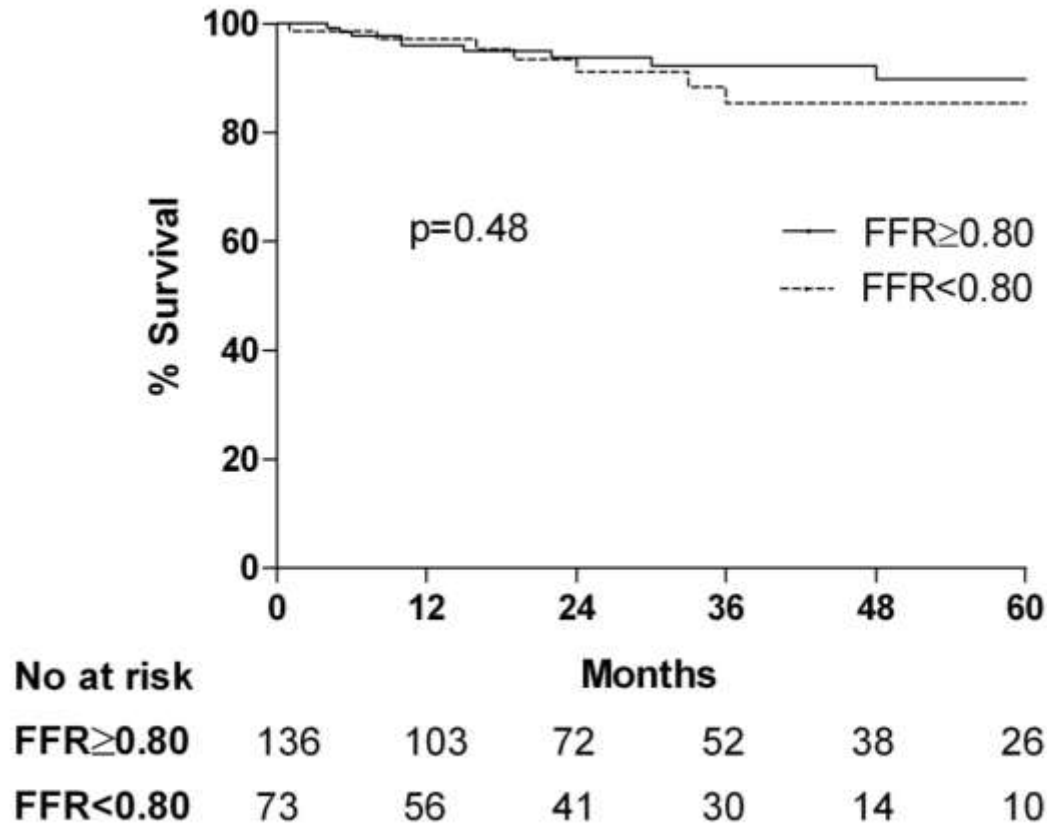
Variability of IVUS Cutoff Values

112 patients with 30-80% LM and FFR and IVUS



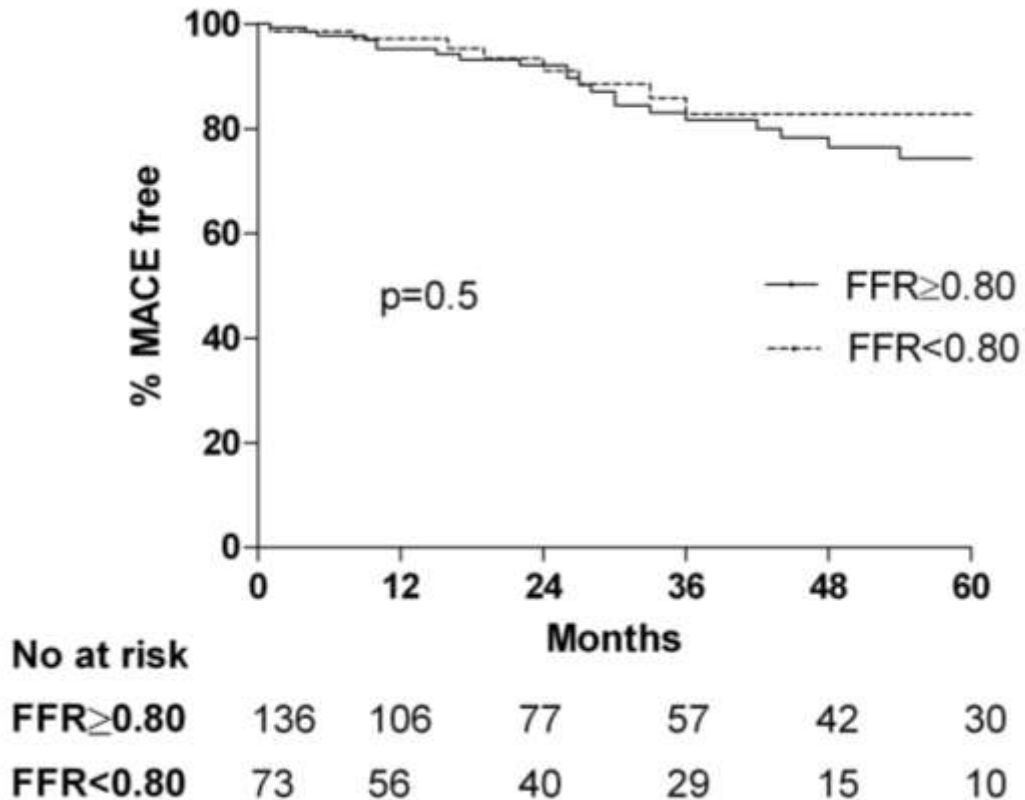
FFR for Assessing LM Significance

Survival Rate



FFR for Assessing LM Significance

MACE Rate

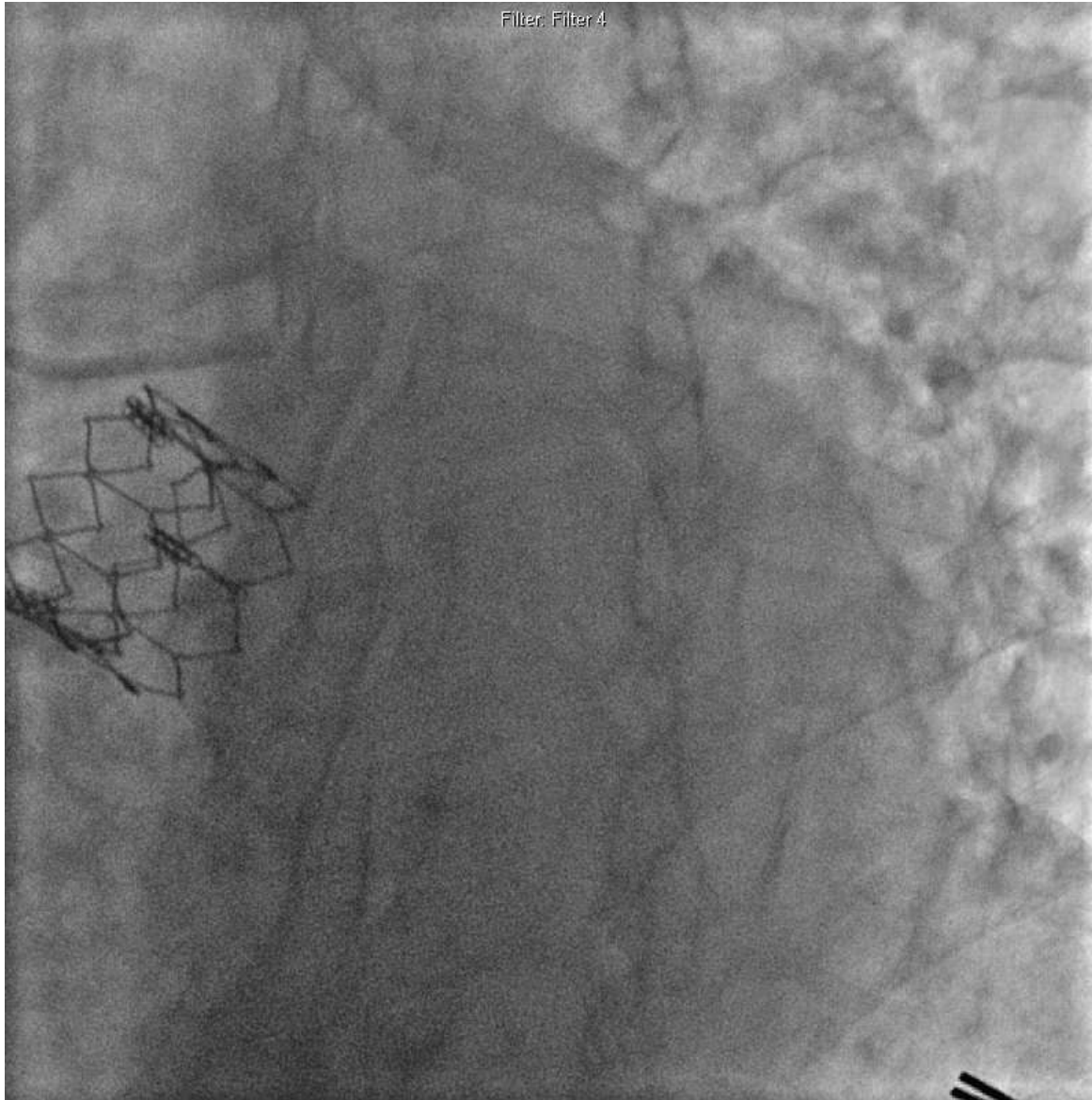


Case Example:

- 69 yo man with a history of Hodgkin's Disease who received chemotherapy and radiation.
- He subsequently developed symptomatic aortic stenosis and we performed TAVR a year ago.
- Now presents with new onset exertional angina.
- Echo shows normal ejection fraction with a well-functioning TAVR with a mean gradient of 10 mmHg.
- With exercise there was lateral and posterior wall hypokinesis.



Filter: Filter 4

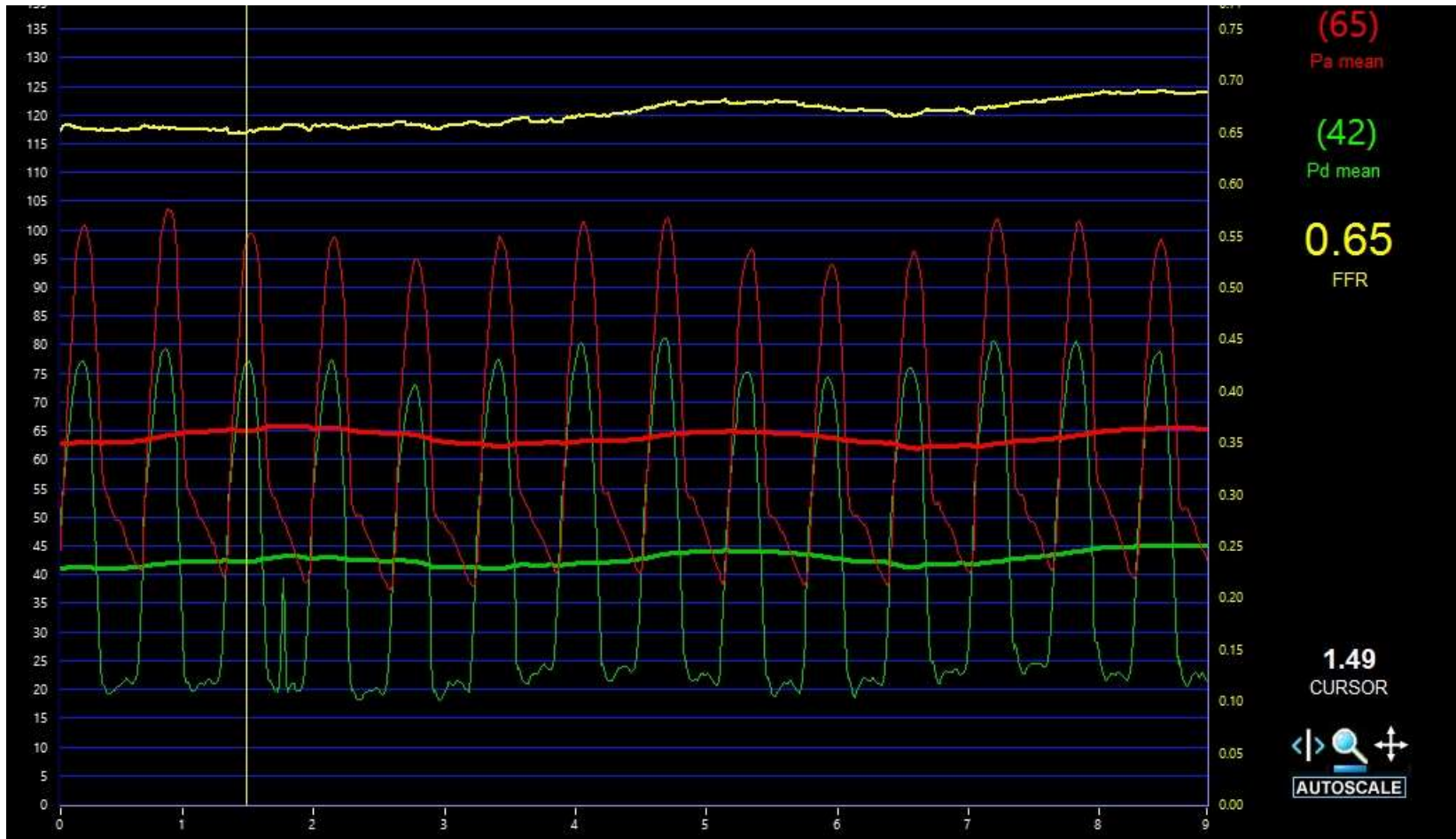


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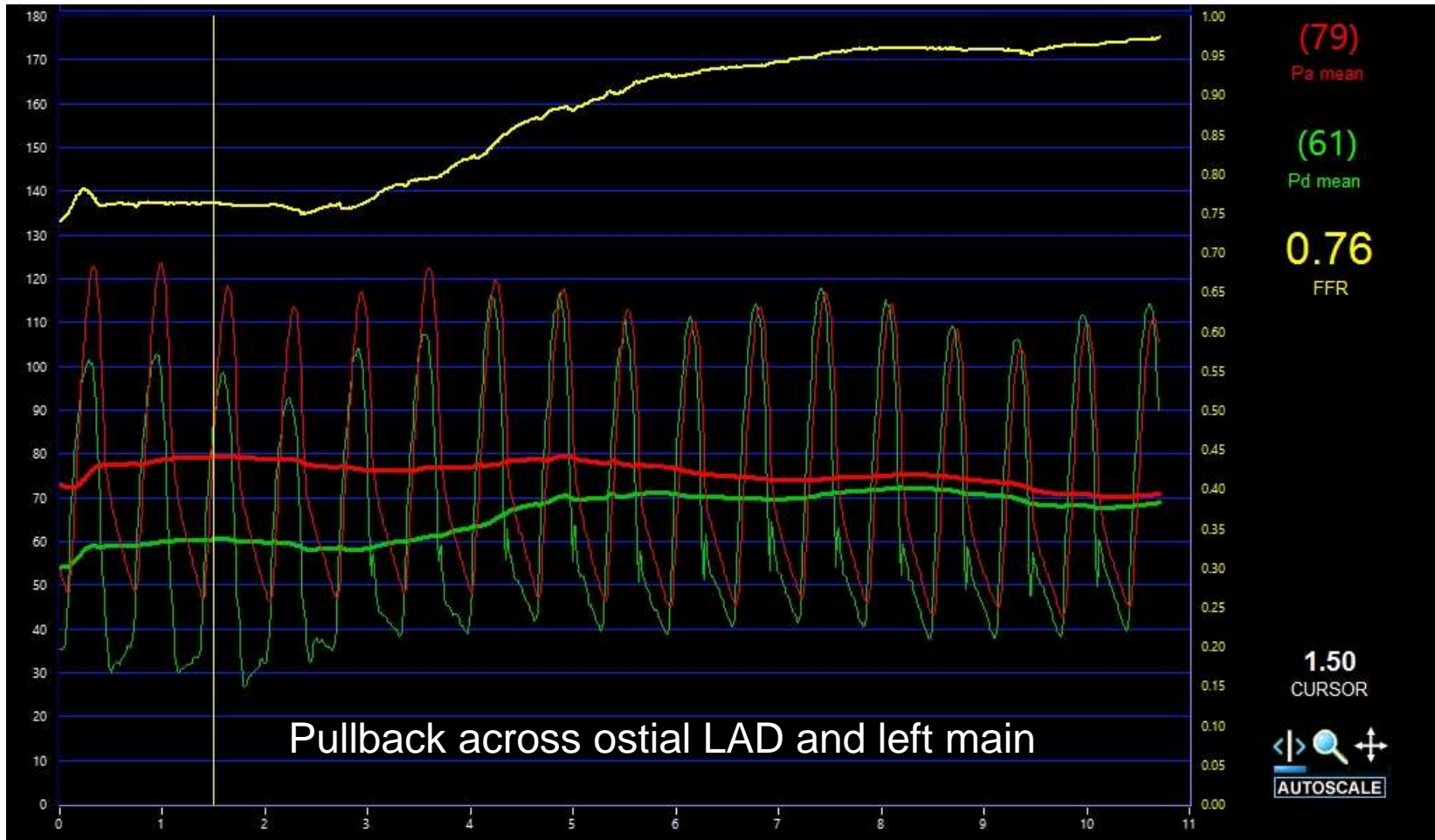




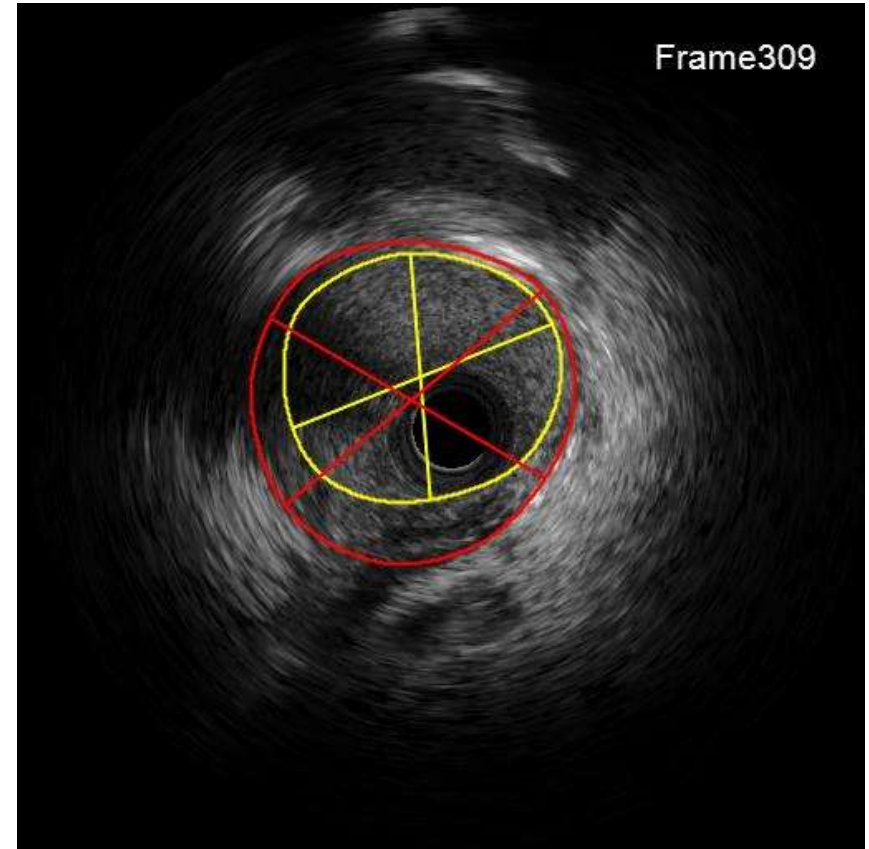
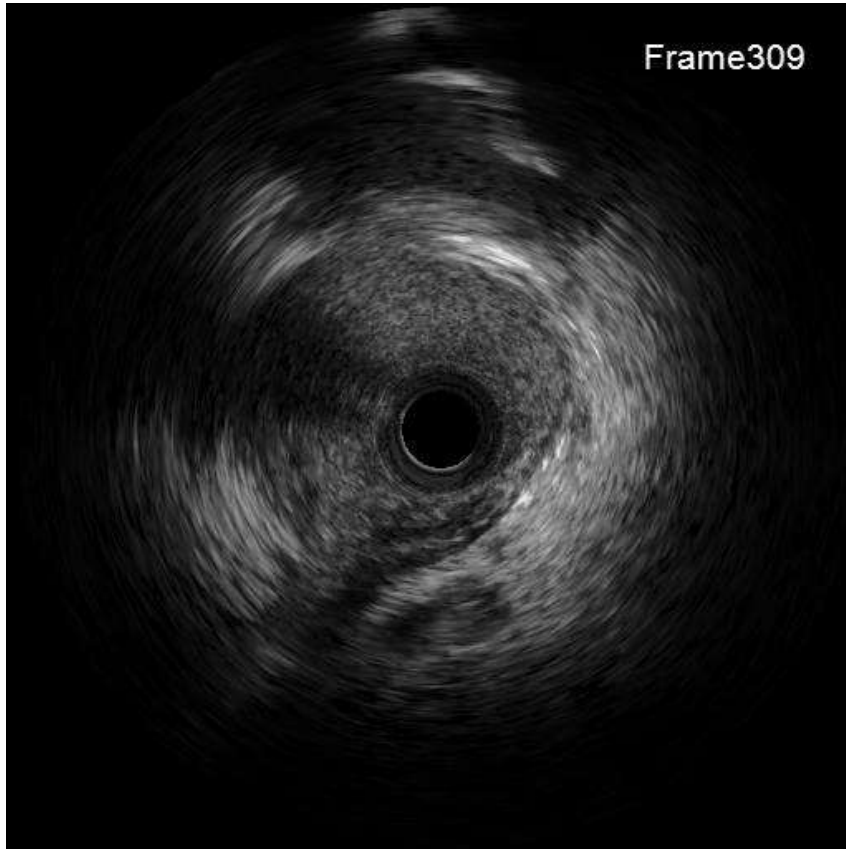
FFR of L Cx



FFR of LAD



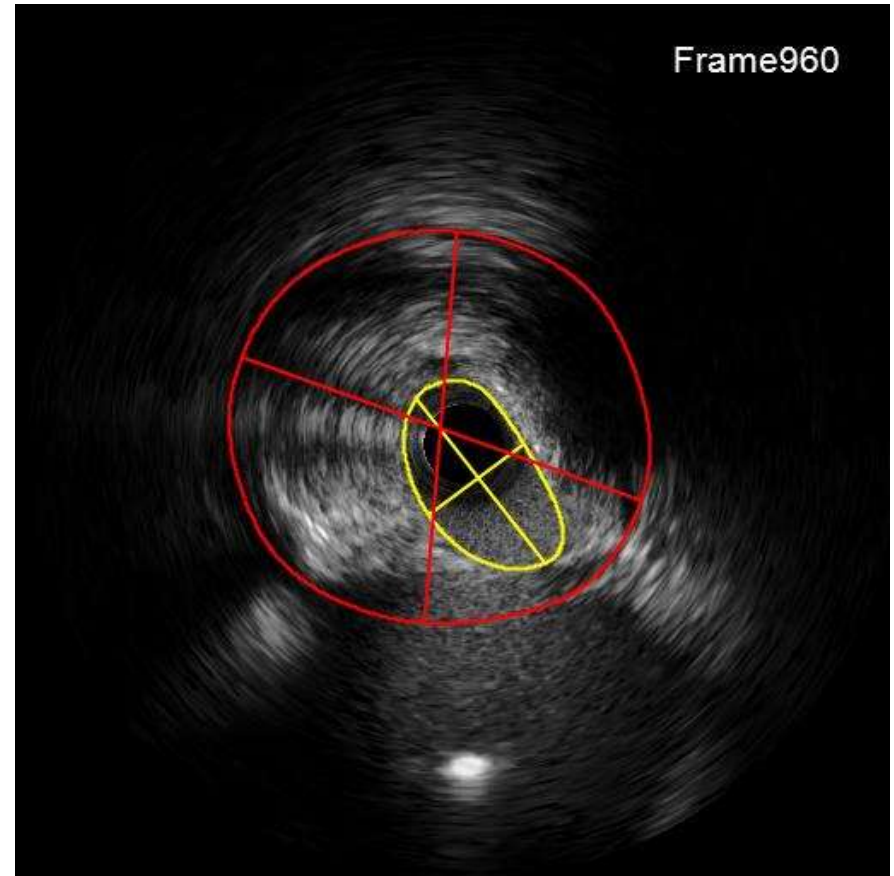
IVUS of LAD Ostium



Minimum Lumen Area = 9.2 mm²



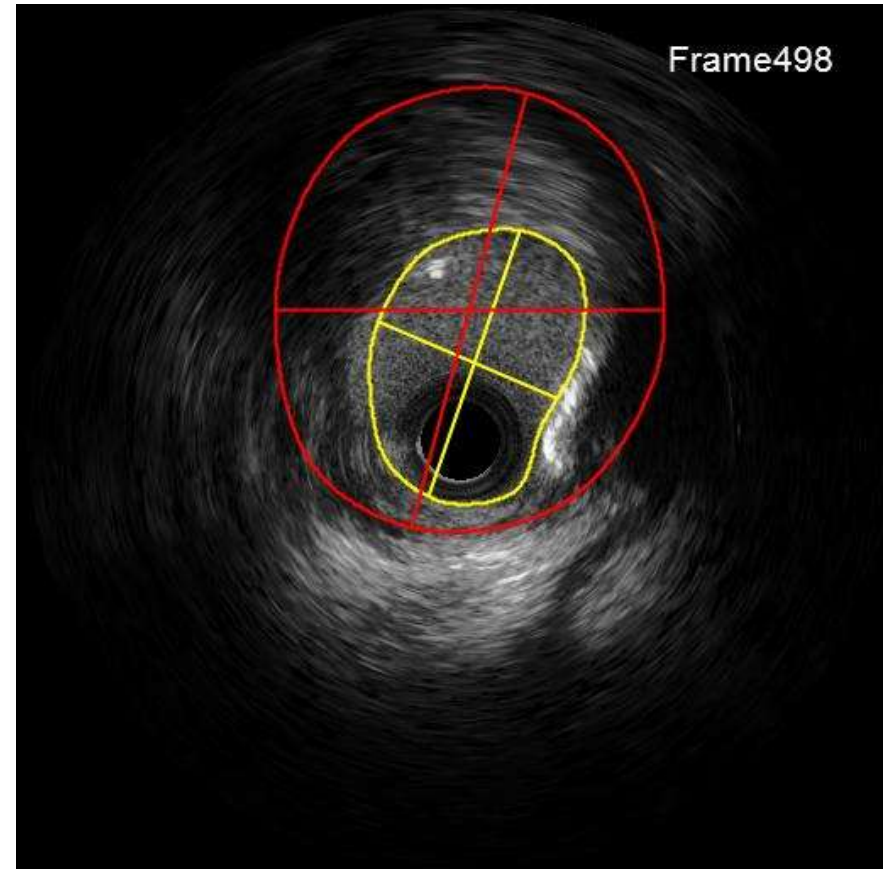
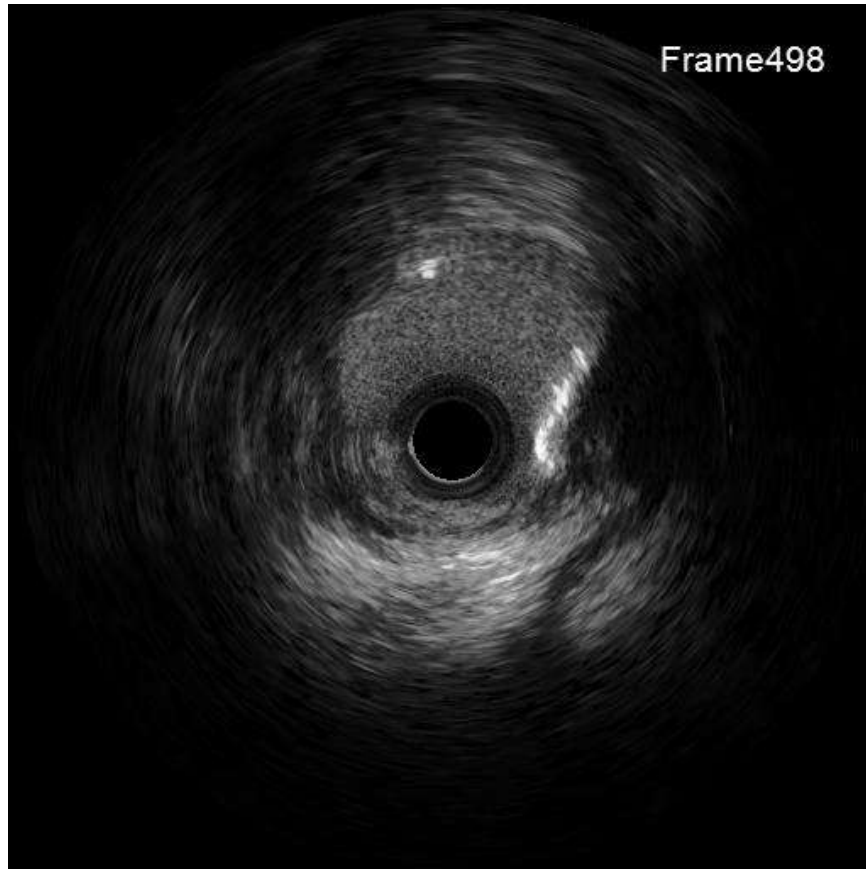
IVUS of Left Circumflex Ostium



Minimum Lumen Area = 3.1 mm²



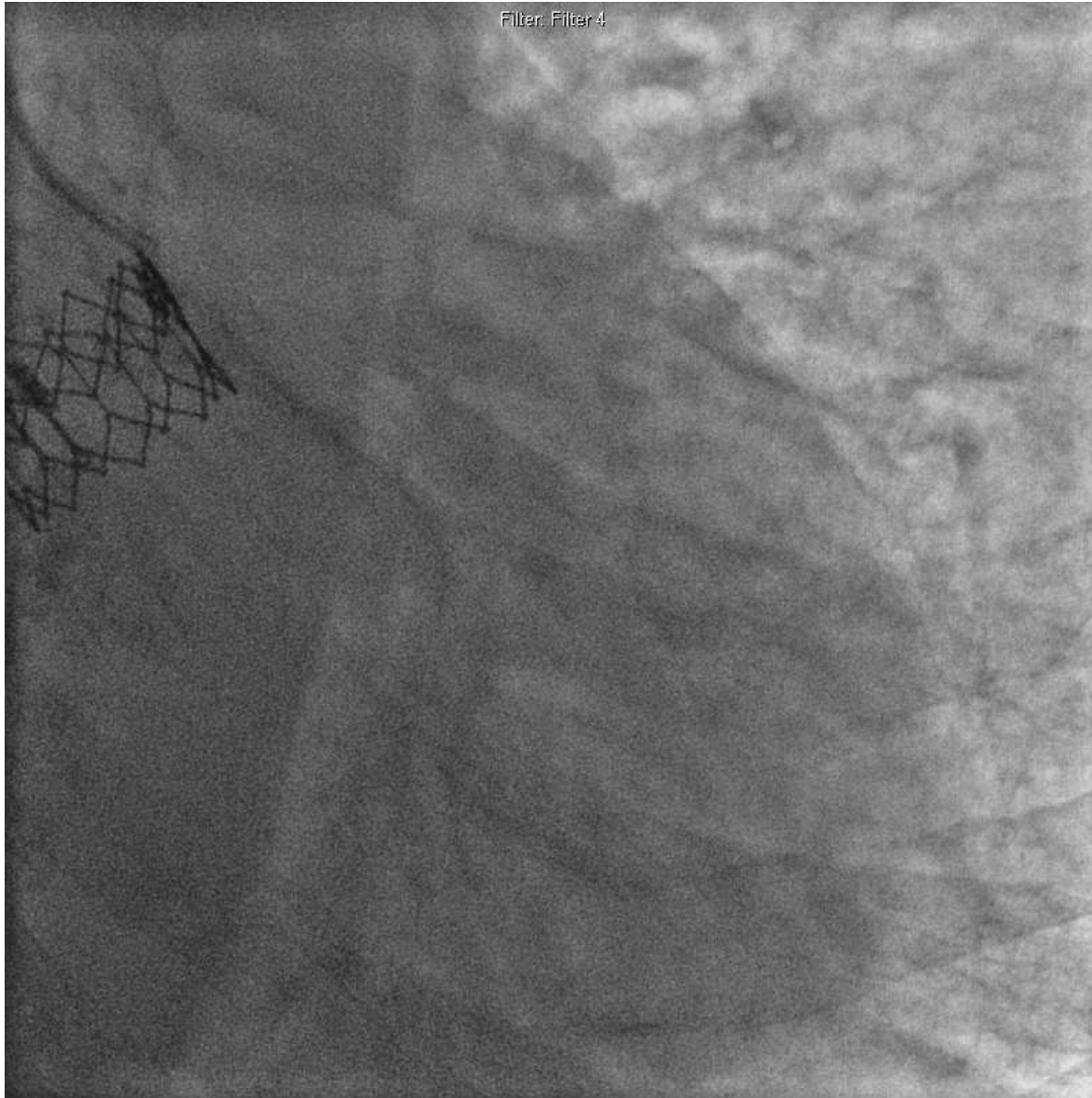
IVUS of Distal Left Main



Minimum Lumen Area = 7.3 mm²



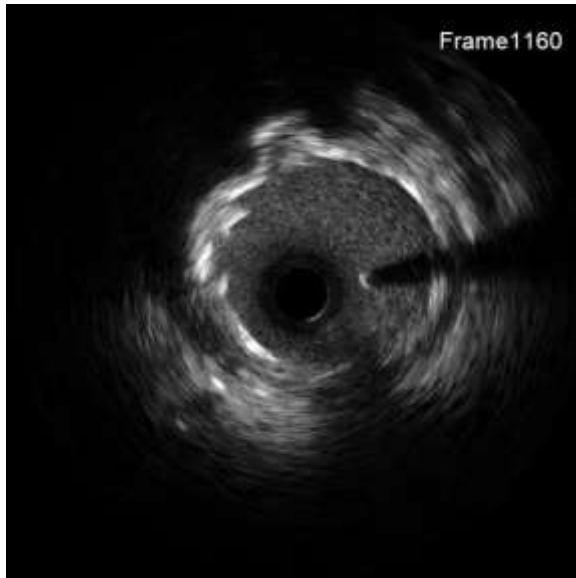
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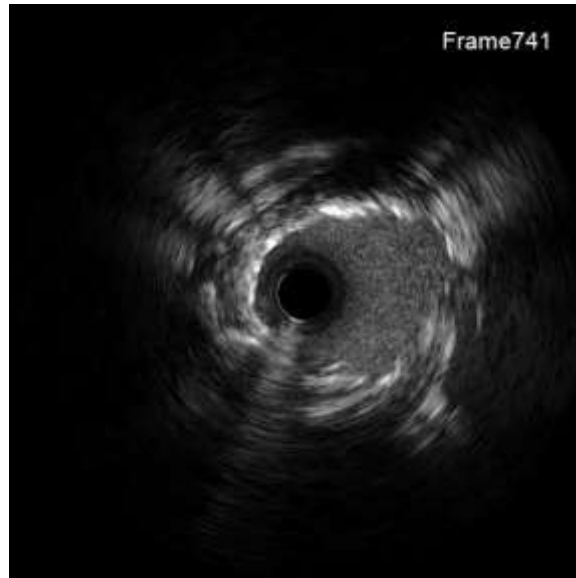


Final IVUS Images

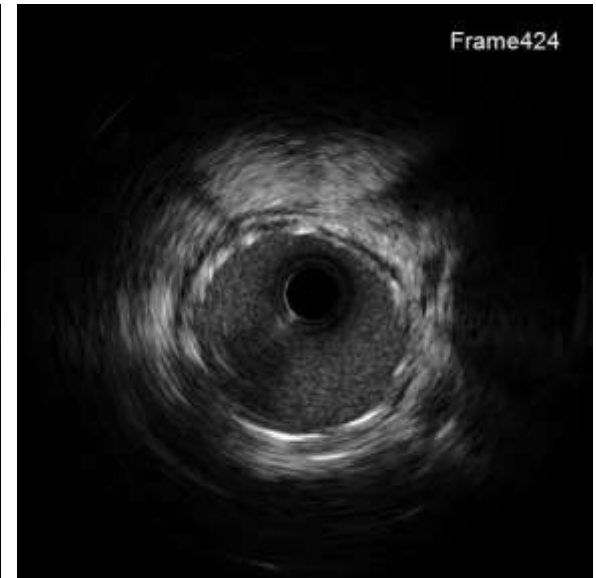
Left Main



Ostium L Cx



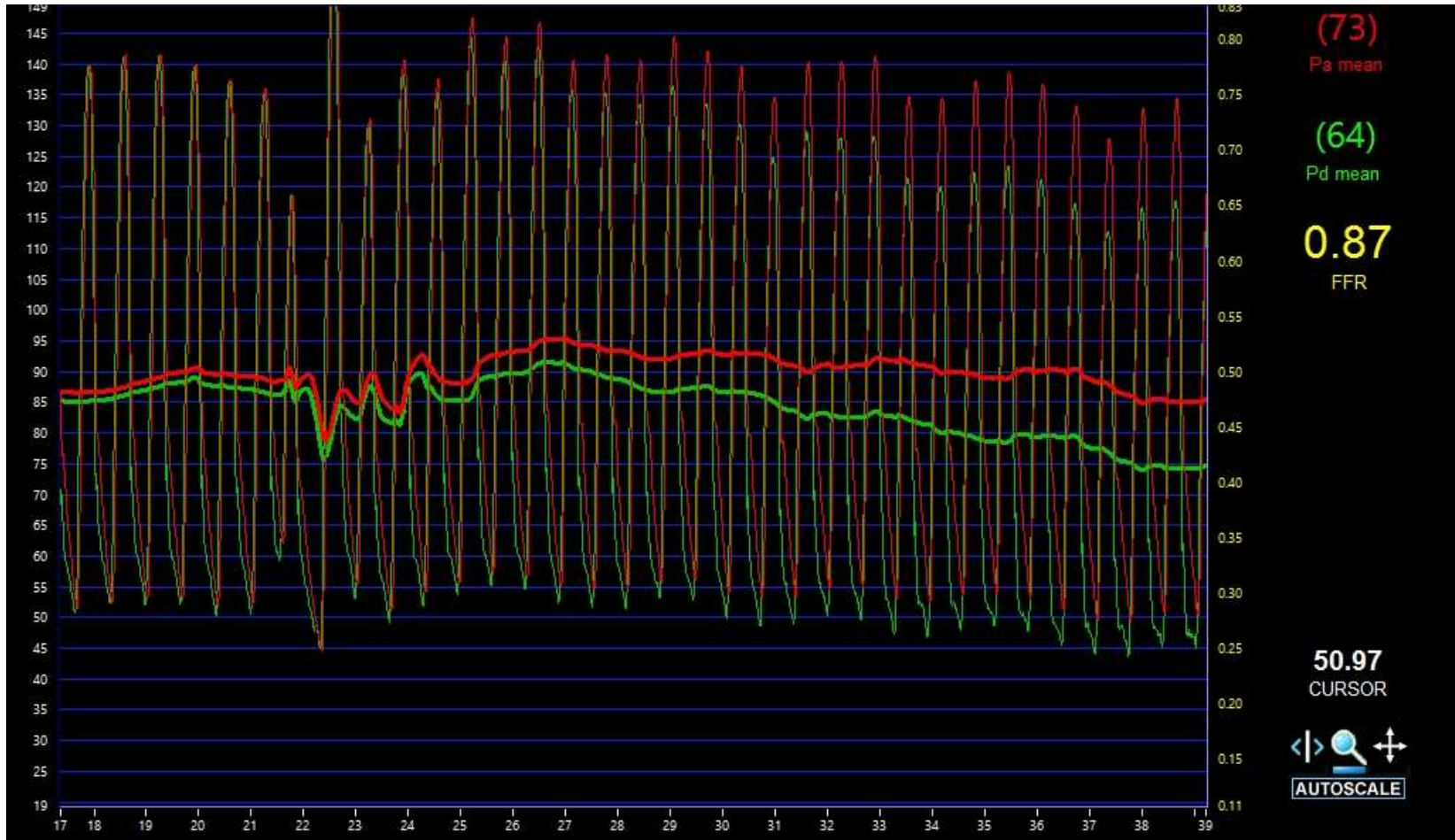
Prox L Cx



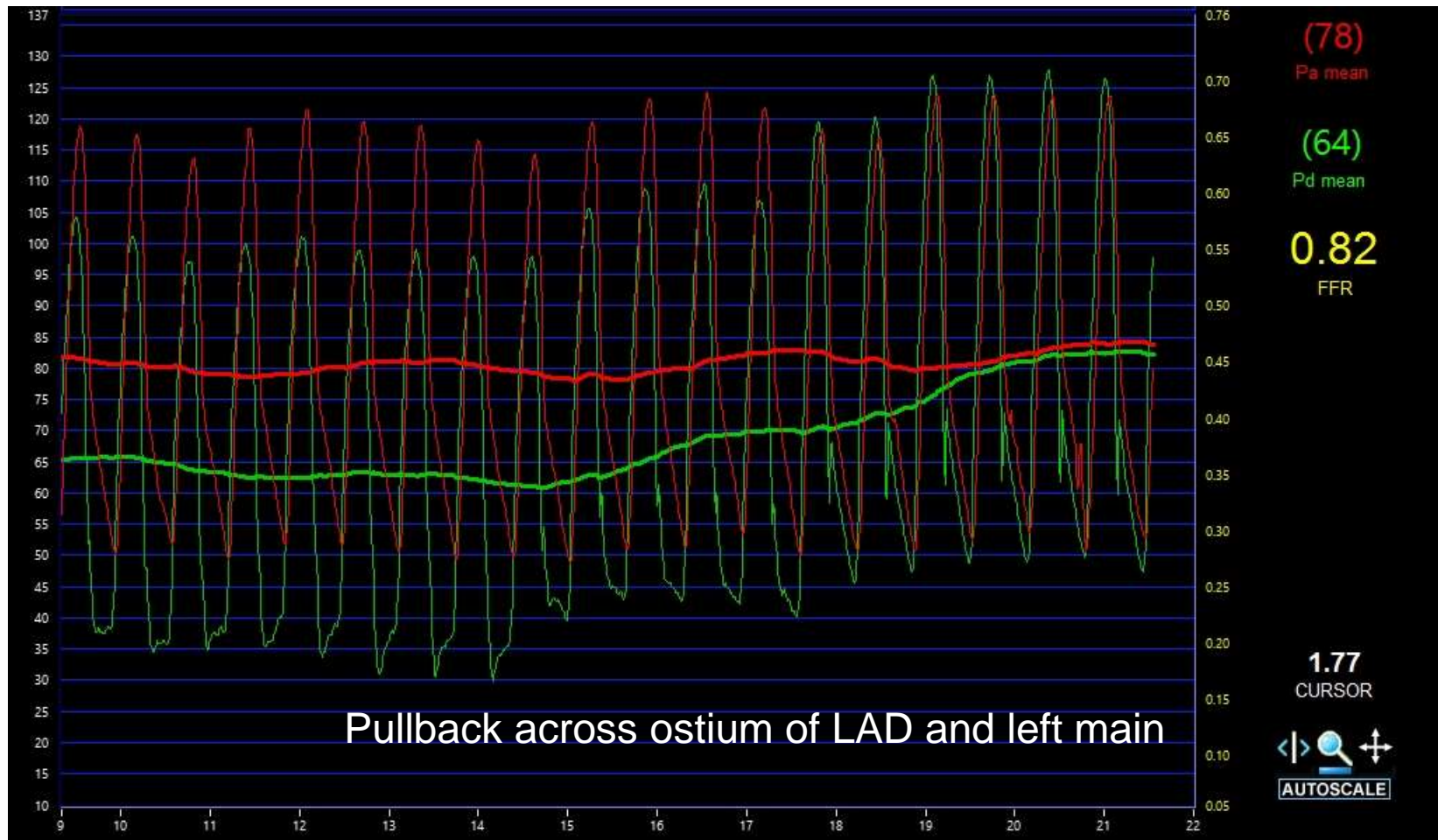
MSA= 8 mm²



FFR of L Cx post



FFR of LAD post



Practical Aspects of LM FFR:

- First measure FFR in the least diseased vessel, preferably the LAD, with a pullback
 - If FFR < 0.80 , then revascularize
 - If FFR > 0.85 , then treat medically
 - If FFR between 0.80 and 0.85 and there is significant downstream epicardial disease in the other epicardial vessel, then can consider IVUS/OCT



Practical Aspects of LM FFR:

- Intravenous adenosine is the ideal hyperemic agent because it allows time to pull the guide catheter out of the ostium.
- A physiologic evaluation of left main disease, compared to an anatomic evaluation alone, is safe and appropriate, just as it is in non-left main CAD.
- Never forget the patient and the clinical scenario.

