



## Bifurcation stenting – Physiologic guidance

*Novel Tools and Techniques: Co-registration and Resting Indexes*

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## .....Novel Tools and Techniques: Co-registration and Resting Indexes

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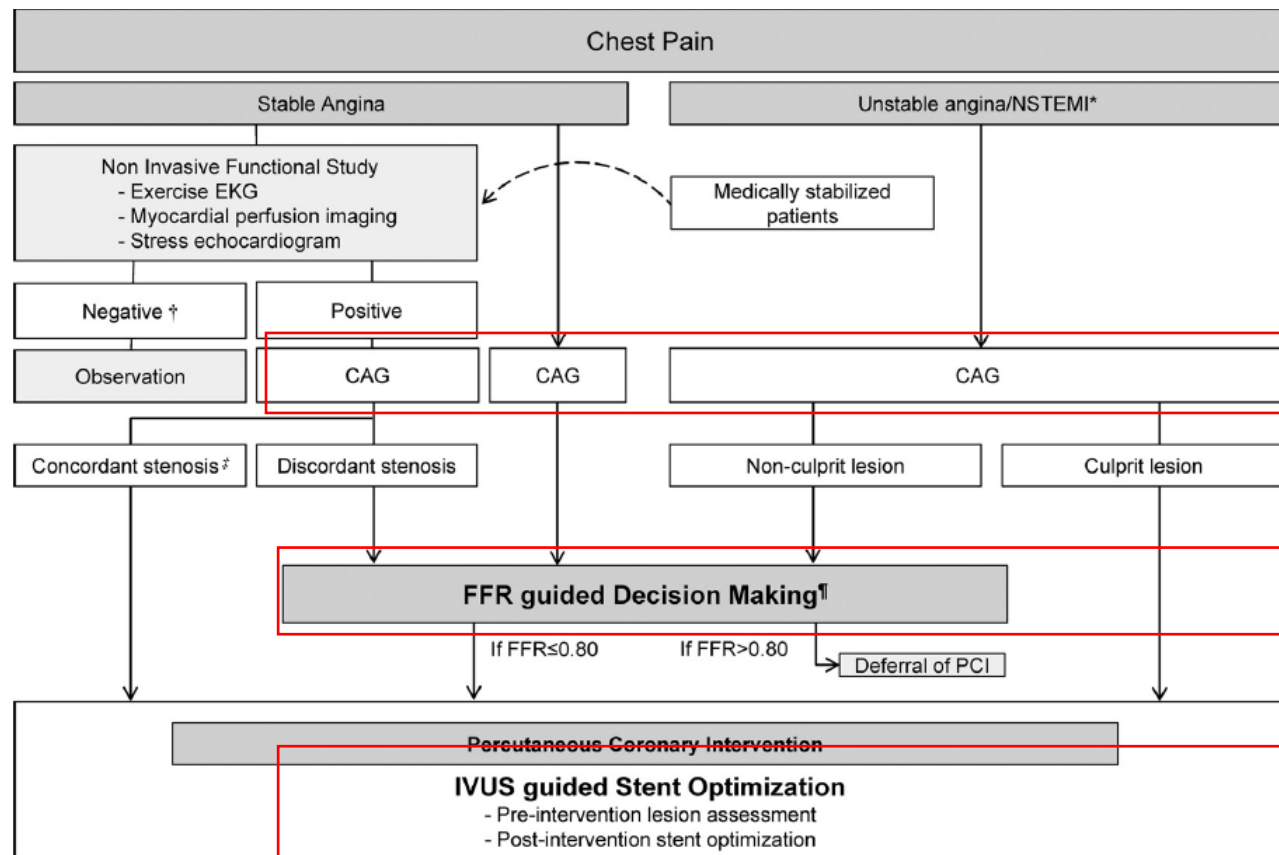
***Disclosure***

Research /Grant support: Volcano Corp., Abbott Vascular, Medtronic Vascular , Boston -Scientific

Consulting: Volcano Corp, Trireme Medical

Boston-Scientific, Abbott Vascular, Medtronic Vascular , Spectranetics

# Advanced Imaging Algorithm



2016-----

- Less contrast
- Less radiation
- Precise and less stenting?
- Better patient outcomes
- Cost-effective

**Angio +**



**iFR / iFR Co-registration**



**IVUS (?OCT) & Co-registration**

Tonino P, De Bruyne B, et al (2009). Fractional Flow Reserve Versus Angiography for Guiding Percutaneous Coronary Intervention. *New England Journal of Medicine*. Volume 360, Number 3:213-224.

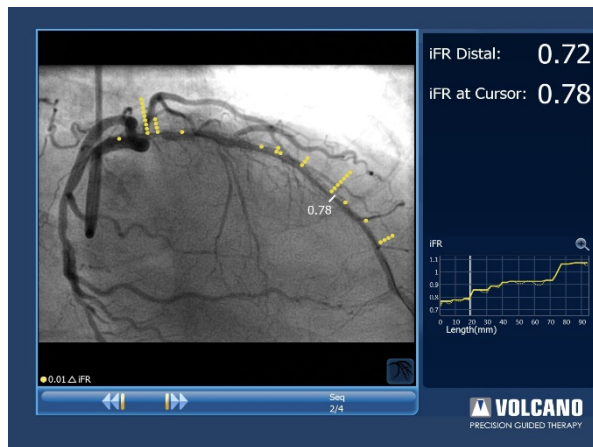
2. Claesson BE, Mehran R, et al, Impact of Intravascular Imaging on Early and Late Clinical Outcome Following PCI with Drug-Eluting Stents. *J. Am. Coll. Cardiol. Interv.* 2011;4:974-981



# Advanced Imaging Solution Functionality

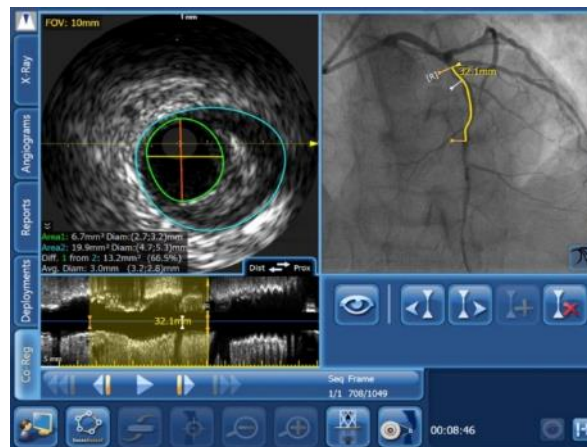
## iFR and IVUS Co-Registration and Angiographic Enhancement

### iFR Co-Registration



- iFR drop is displayed on angio
- Length measurement without pullback device

### IVUS Co-Registration



- Localization of IVUS with angiography
- Easy length/area/diameter measurements with manual pullback

### Angio+ Enhanced Angiography



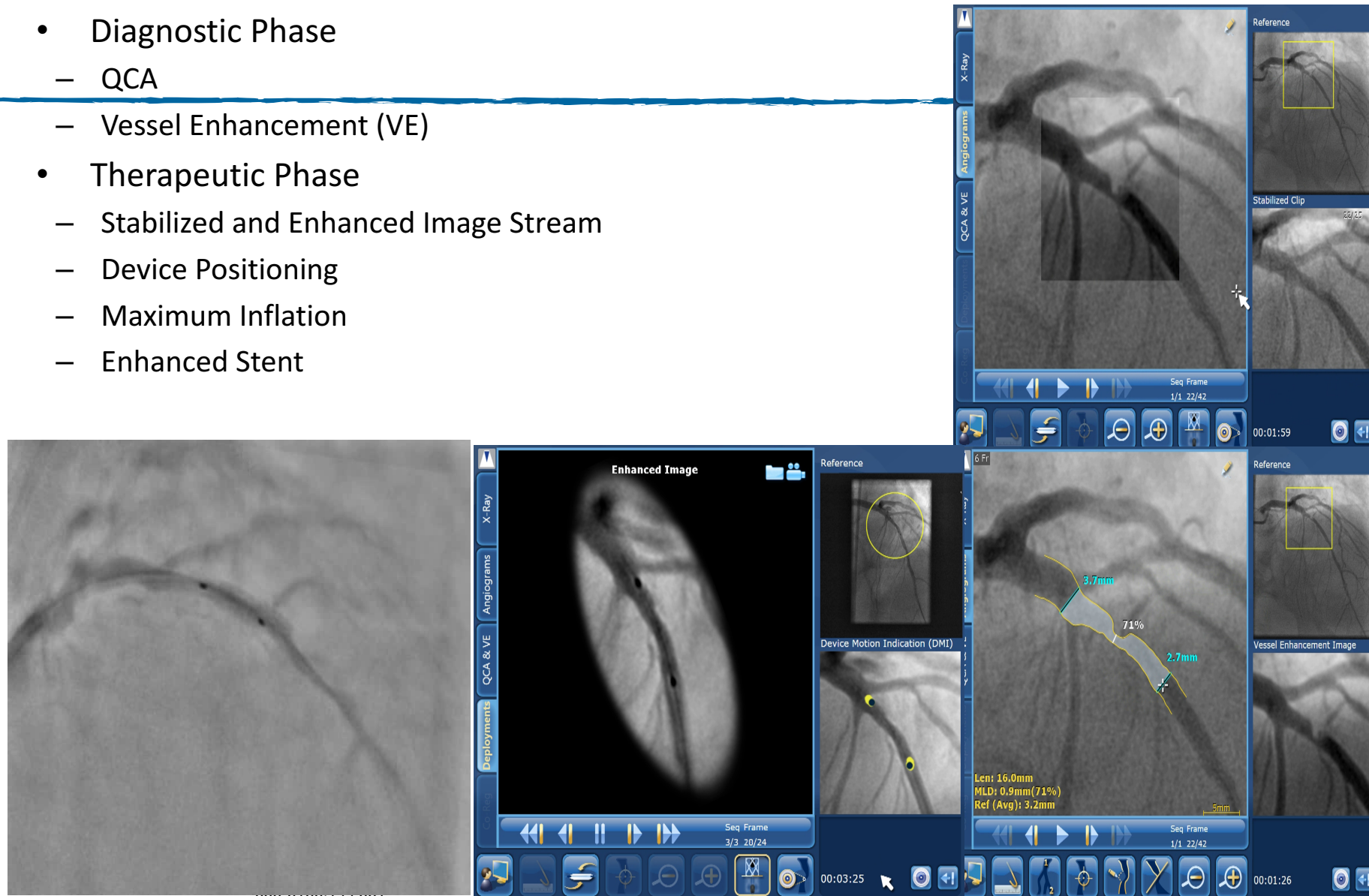
- Vessel Enhancement
- QCA & Device Detection



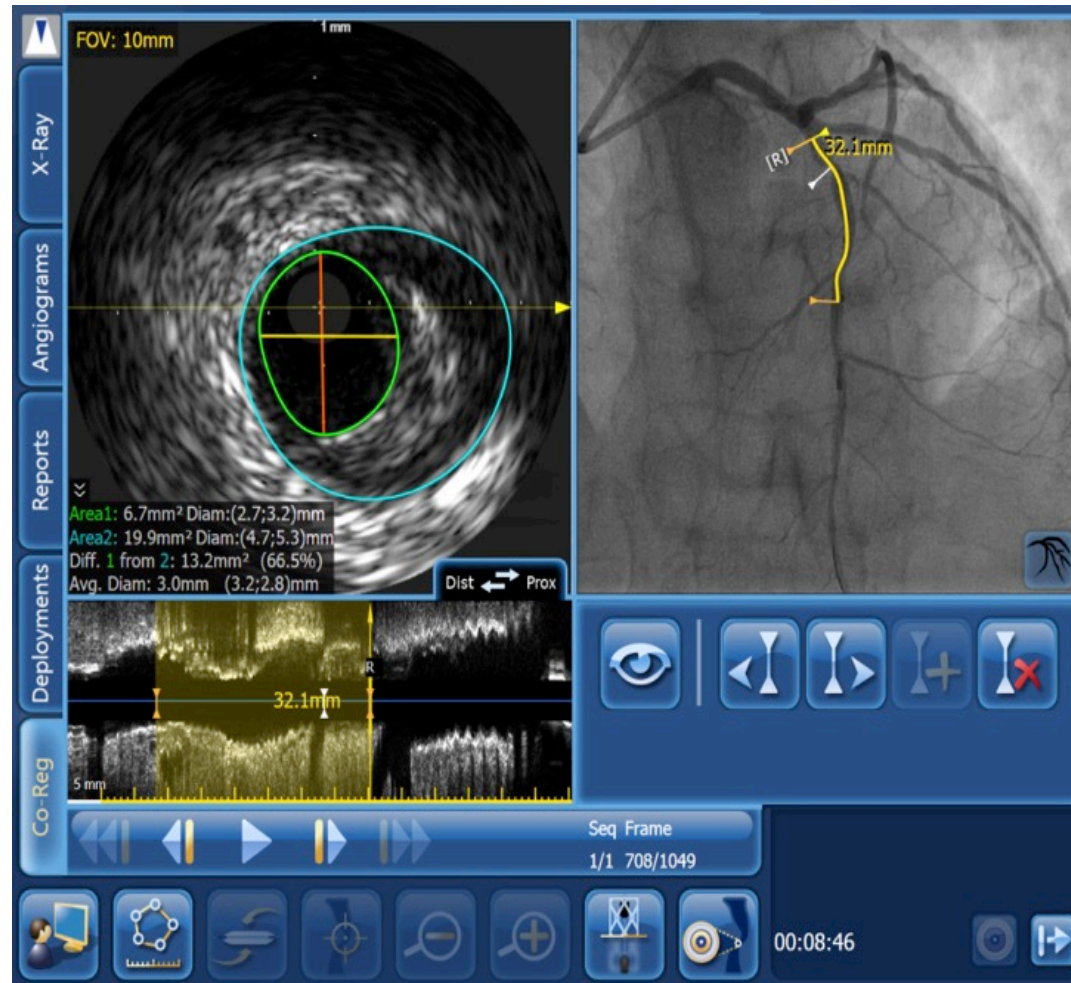


# Angio +

- Diagnostic Phase
  - QCA
  - Vessel Enhancement (VE)
- Therapeutic Phase
  - Stabilized and Enhanced Image Stream
  - Device Positioning
  - Maximum Inflation
  - Enhanced Stent



# Real-time IVUS Co-registration with Angio+ simplifies sizing

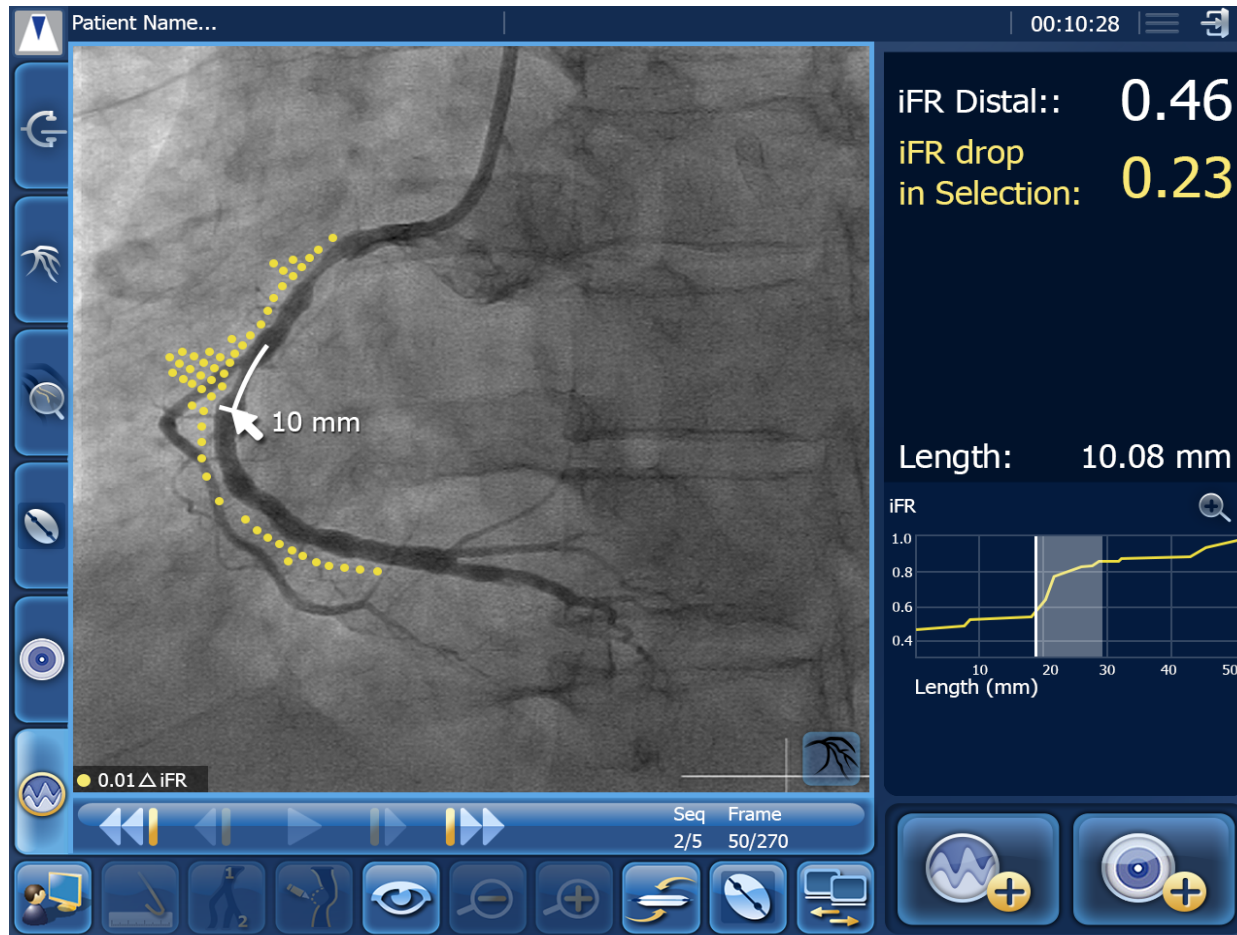


**Easy length  
measurement with  
manual pullback**

**Area & diameter  
measurements**

# iFR Co-Registration

With iFR co-registration there is no need for hyperemic drugs, no need for time consuming pullback devices and no need for guesswork



- Make length measurements without a cumbersome pullback device
- Plan your procedure with physiologic guidance



# CASE 1

**Jasvinder Singh MD**

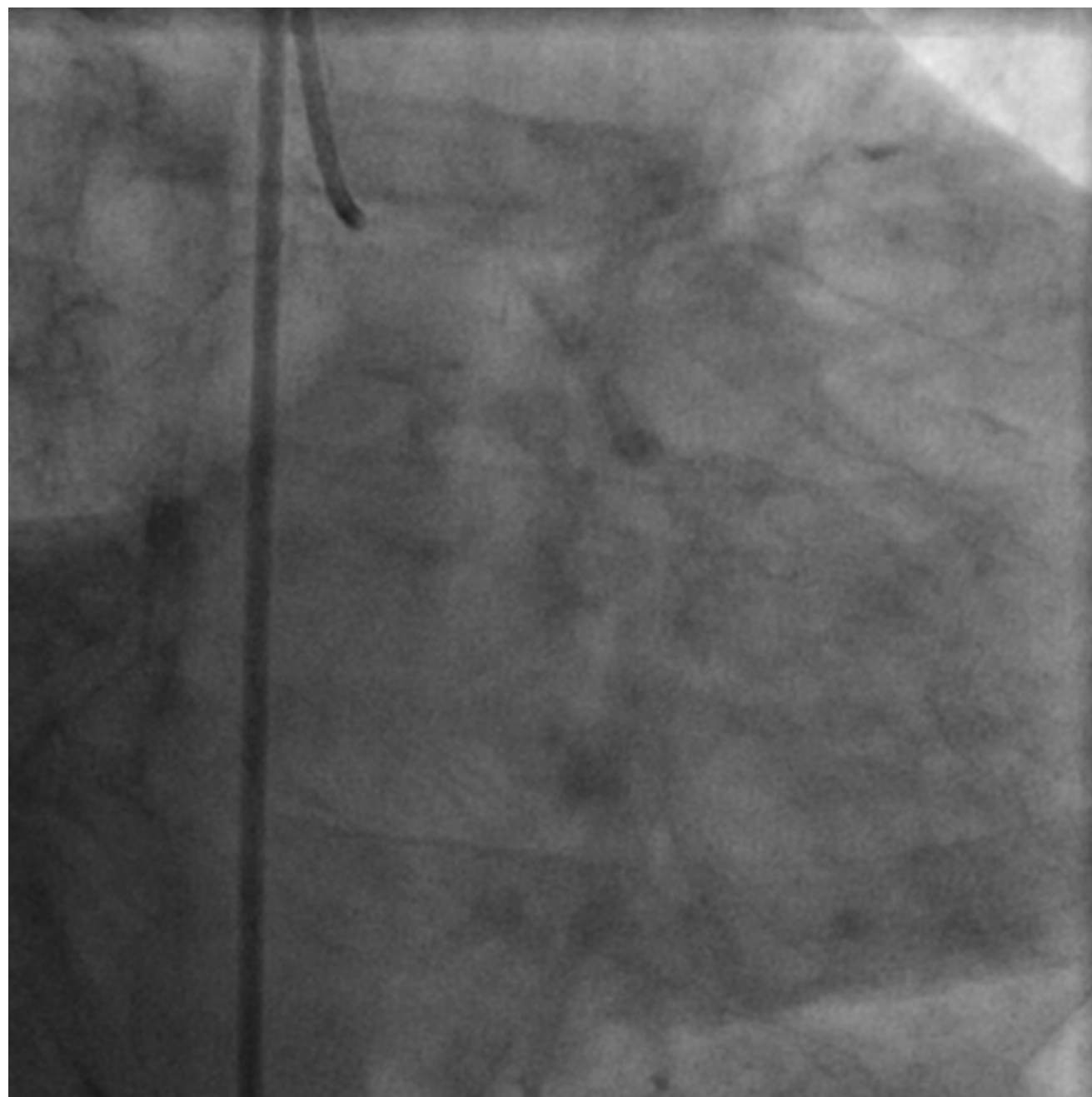
**Barnes Jewish Hospital of Washington University**



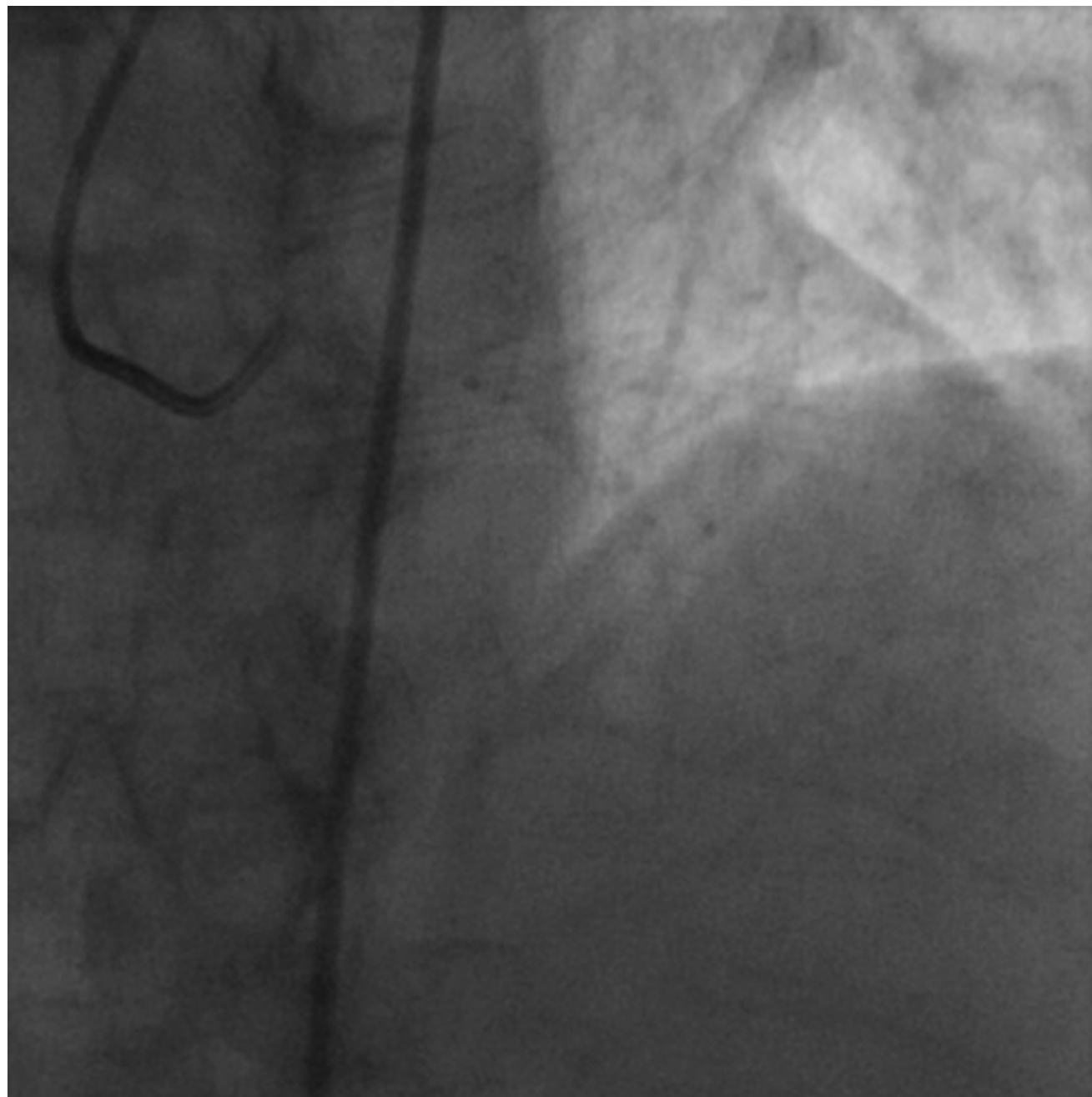
# RK

- 78 year old woman with PMH significant for:
  - HTN
  - Hyperlipidemia
  - DMII
  - CAD s/p MI with angioplasty to the diagonal and OM in 1999
- During preoperative evaluation for bilateral knee replacement, she complained of recent chest discomfort (squeezing chest discomfort with exertion for several weeks, relieved with rest, similar in nature to that of prior angina).
- Given her known history of CAD with typical chest pain, she was been referred for invasive assessment. She underwent Cardiac Catheterization.



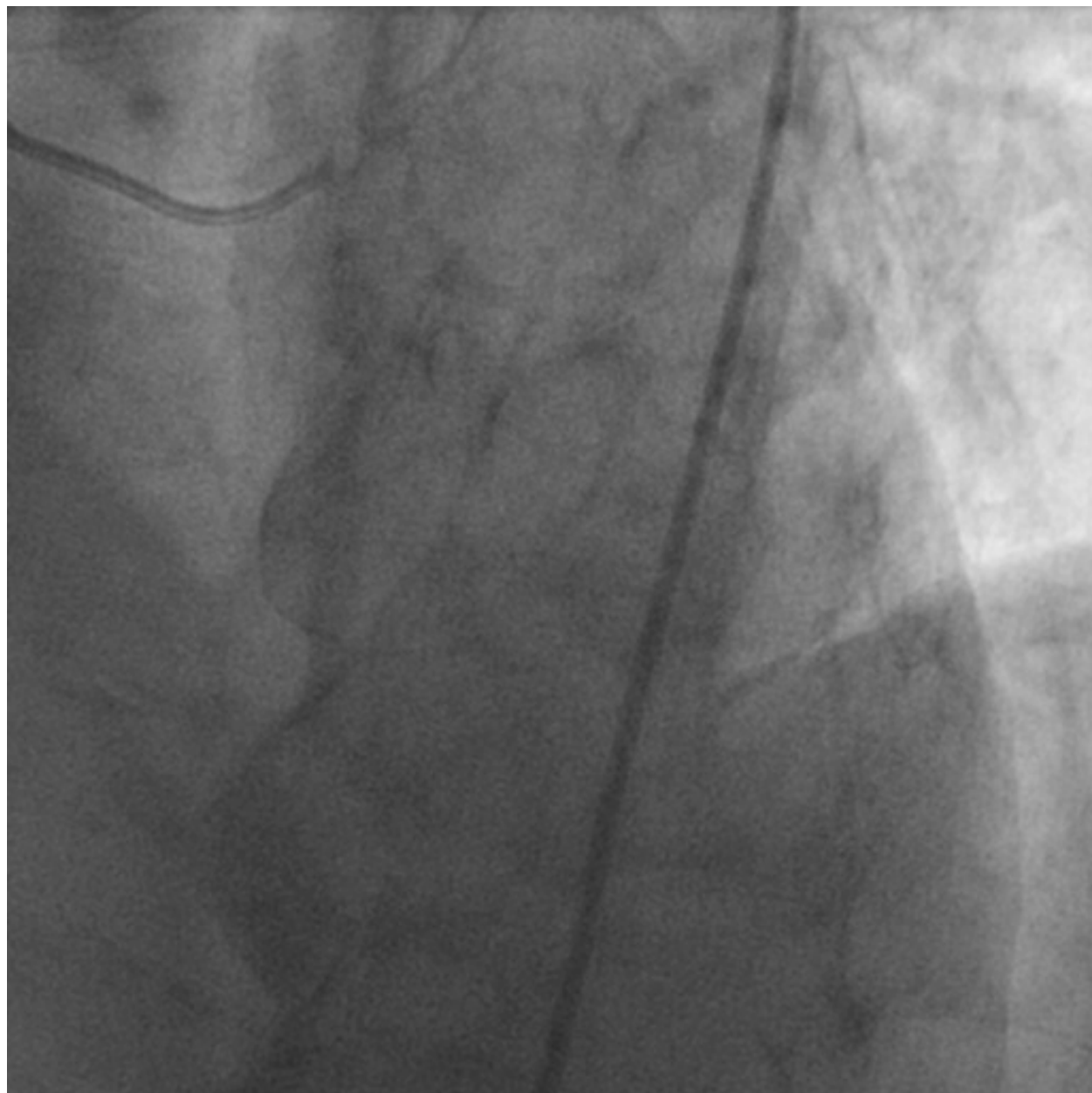


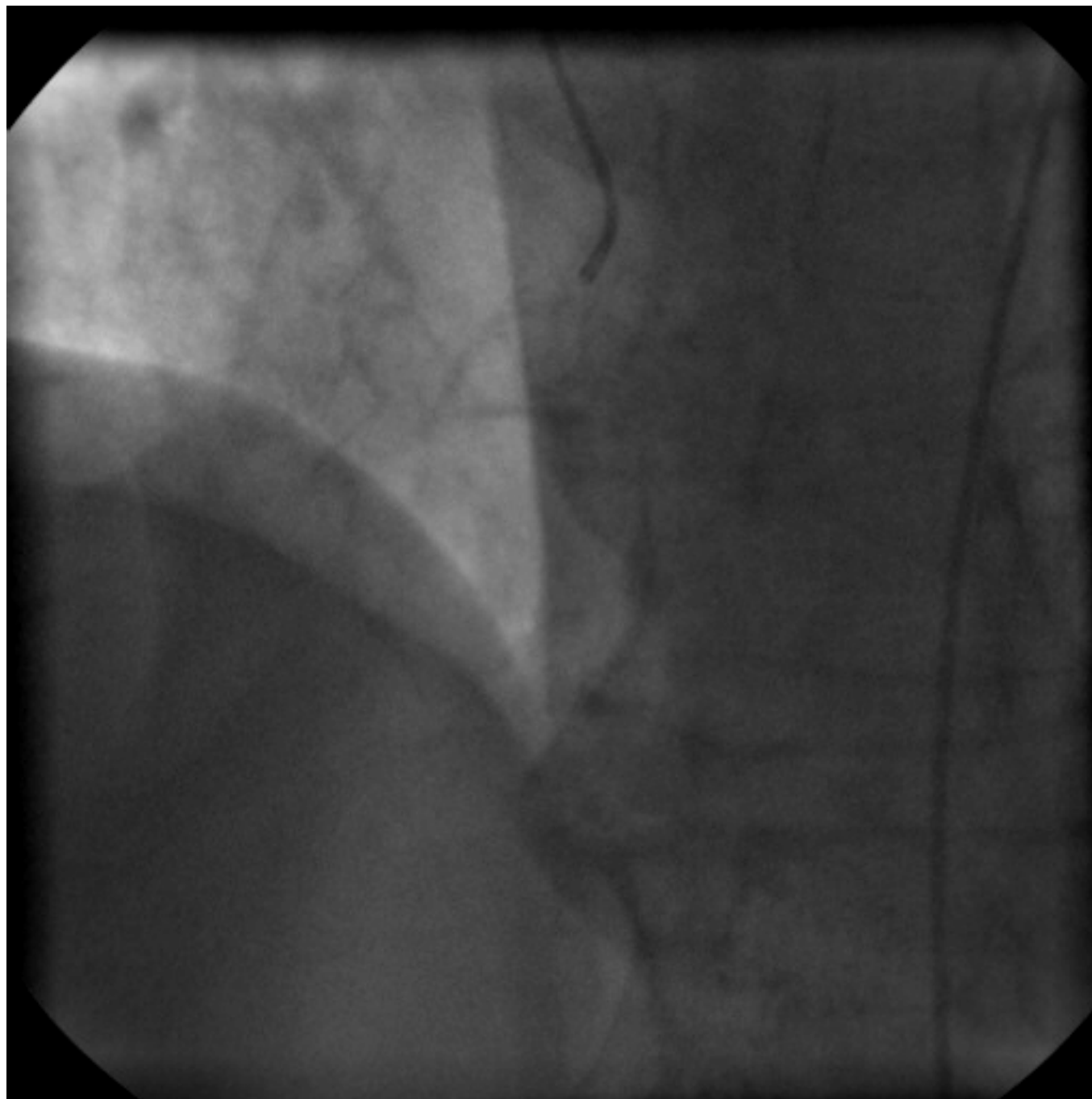
XIII European Bifurcation Club meeting - Porto, Portugal - 13th & 14th October 2017







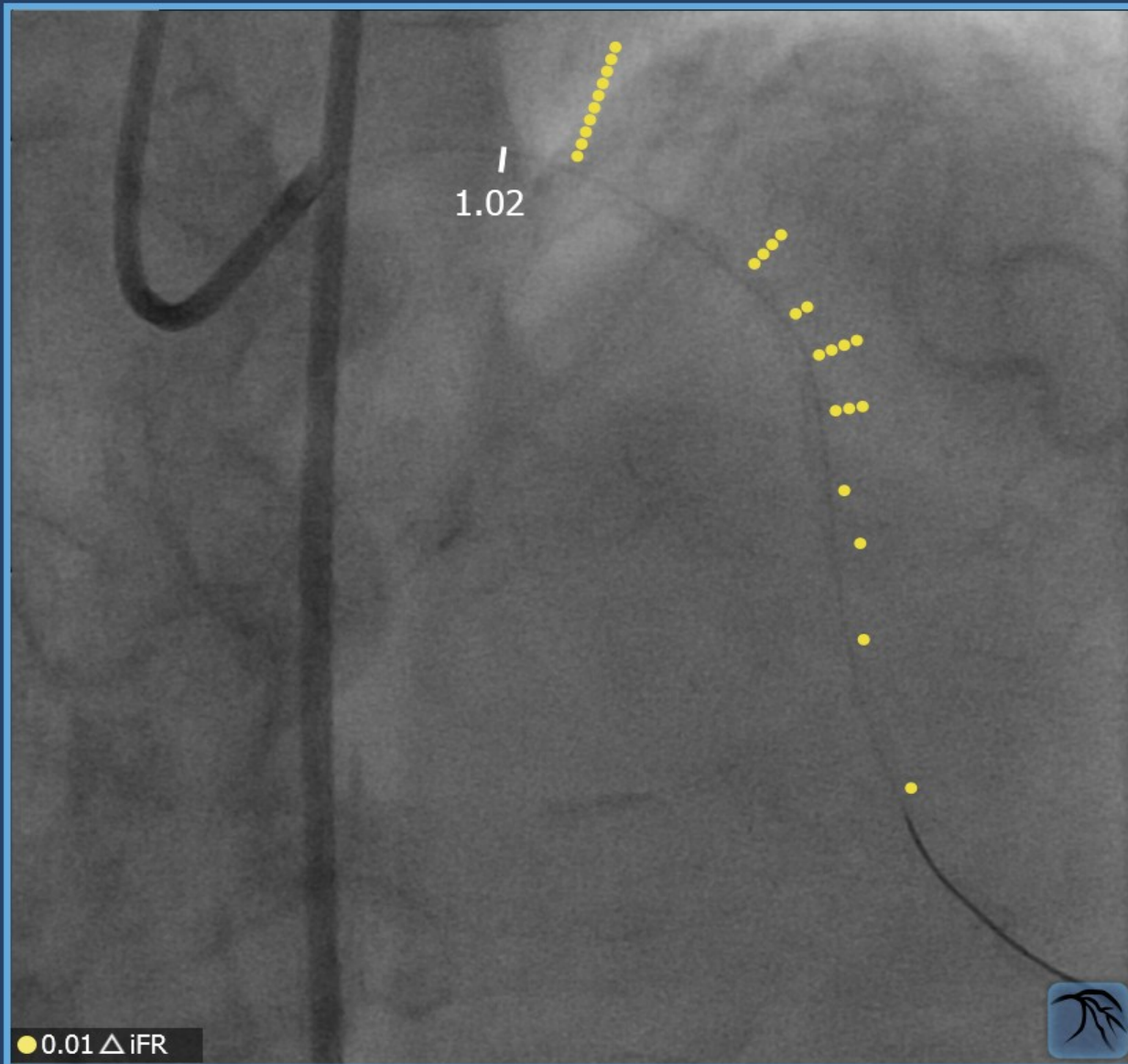






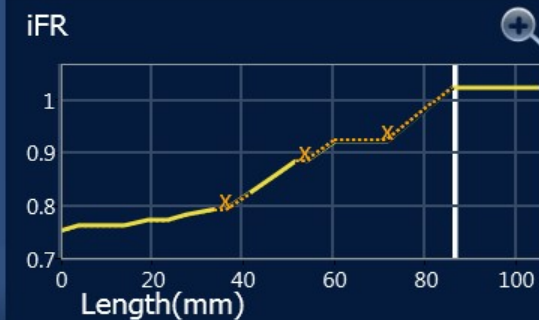
# Management?

- Medical Rx
- Complex PCI vs CABG based on Angio alone?
- Hemodynamic and anatomic assessment with iFR/FFR and IVUS?



iFR Distal: 0.75

iFR at Cursor: 1.02



Marked points were filtered out of the calculation





# Hemodynamic & Anatomic Assessments

- Complex calcified 50-60% lesion in distal Left Main extending into proximal LAD with 60-70% disease which was hemodynamically assessed with iFR and found to be significant at 0.73.
- iFR pullback demonstrated significant step up in both the distal L Main and prox-mid LAD.
- Hemodynamic assessment of Ostial CX with iFR which was non-significant (0.98).



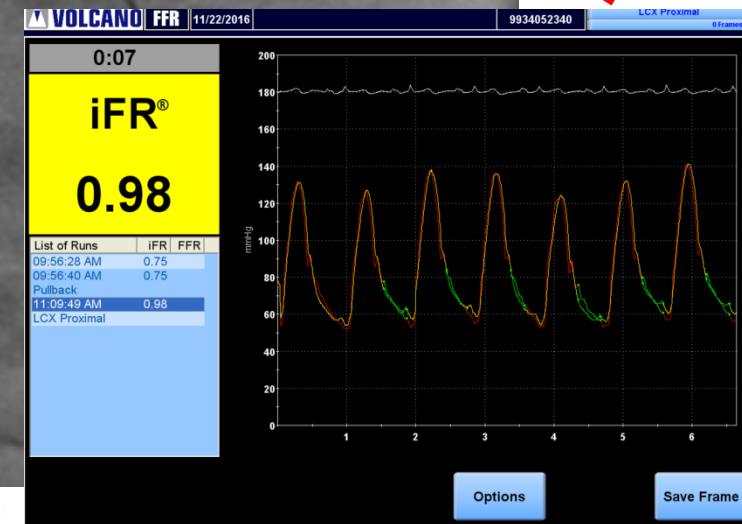
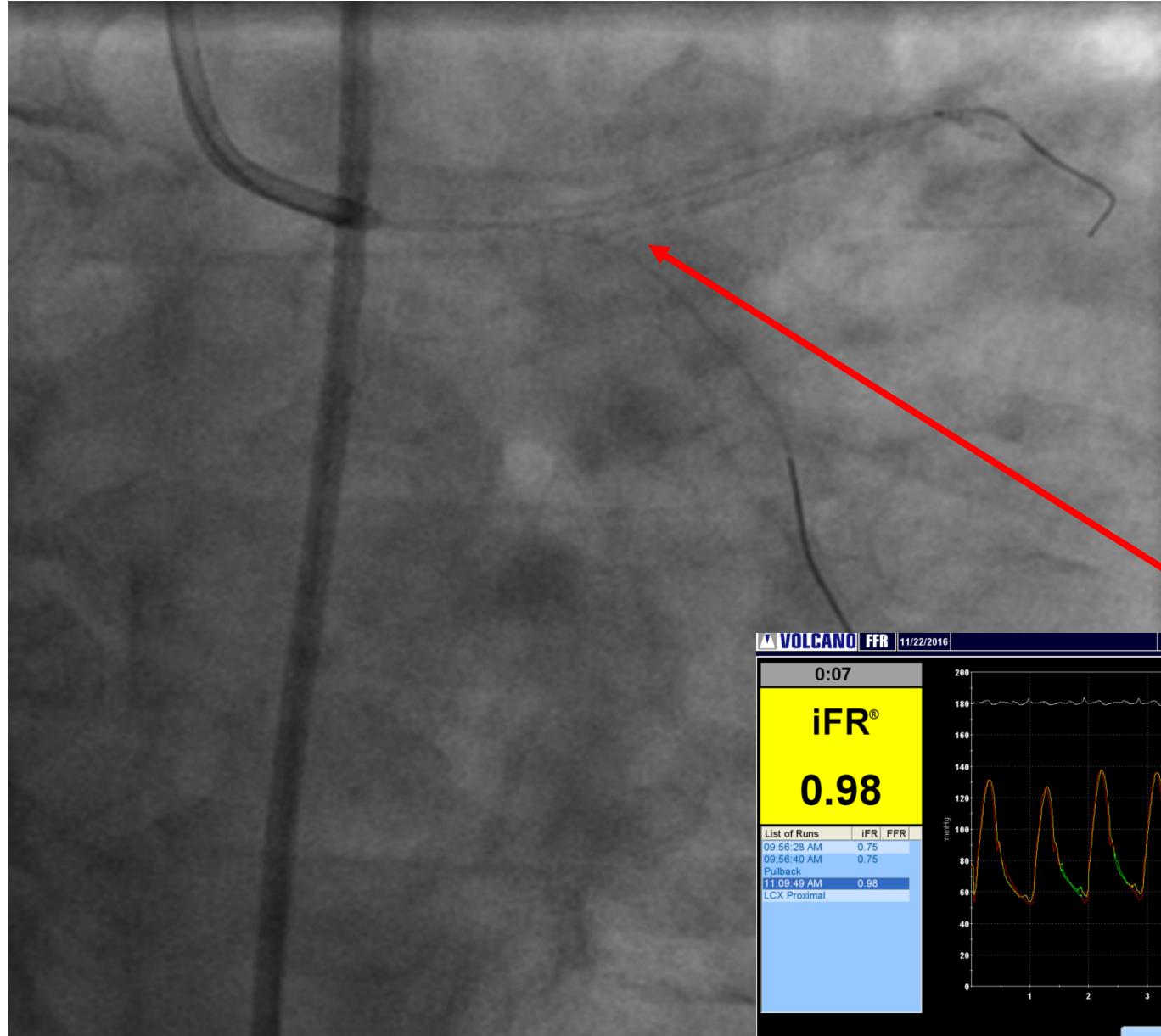
- **How does management approach change with the added information from iFR, FFR, and IVUS?**
- **What is the potential revascularization strategy?**



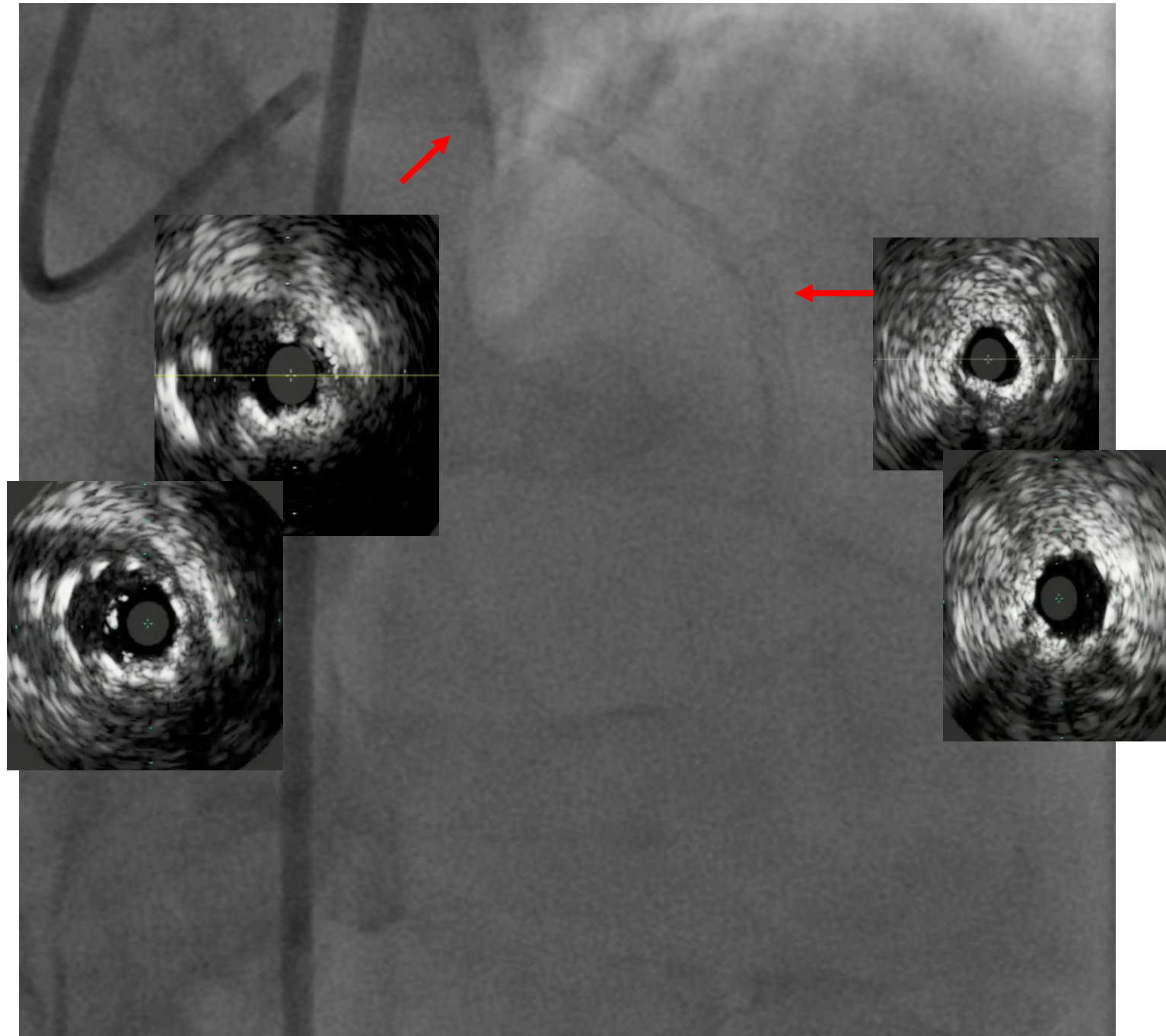




# Circumflex Assessment







# Conclusions

- iFR Co-registration precisely provided contribution of each lesion in the significant zones
- IVUS coreg provided sizing, plaque distribution and characteristic, choice of therapy and stent optimization
- Post iFR Circumflex- no added stent needed
- Saved time , less contrast use and radiation ,less stent and excellent PCI optimization.
- Same day discharge , avoiding CABG, better patient satisfaction