

Step by Step: IVUS, Case Analysis and Resolution



Costantino O. Costantini, M.D.
Hospital Cardiológico Costantini
Fundação Francisco Costantini
Curitiba – Brazil
cocostantini@hospitalcostantini.com.br



**SOLACI
SBHCI
2013**

Conflict of Interests

- Our Center is an IVUS and Complex PCI Learning Center in Latin America for Boston Scientific



Costantino O. Costantini, M.D.
Hospital Cardiológico Costantini
Fundação Francisco Costantini
Curitiba – Brazil
cocostantini@hospitalcostantini.com.br



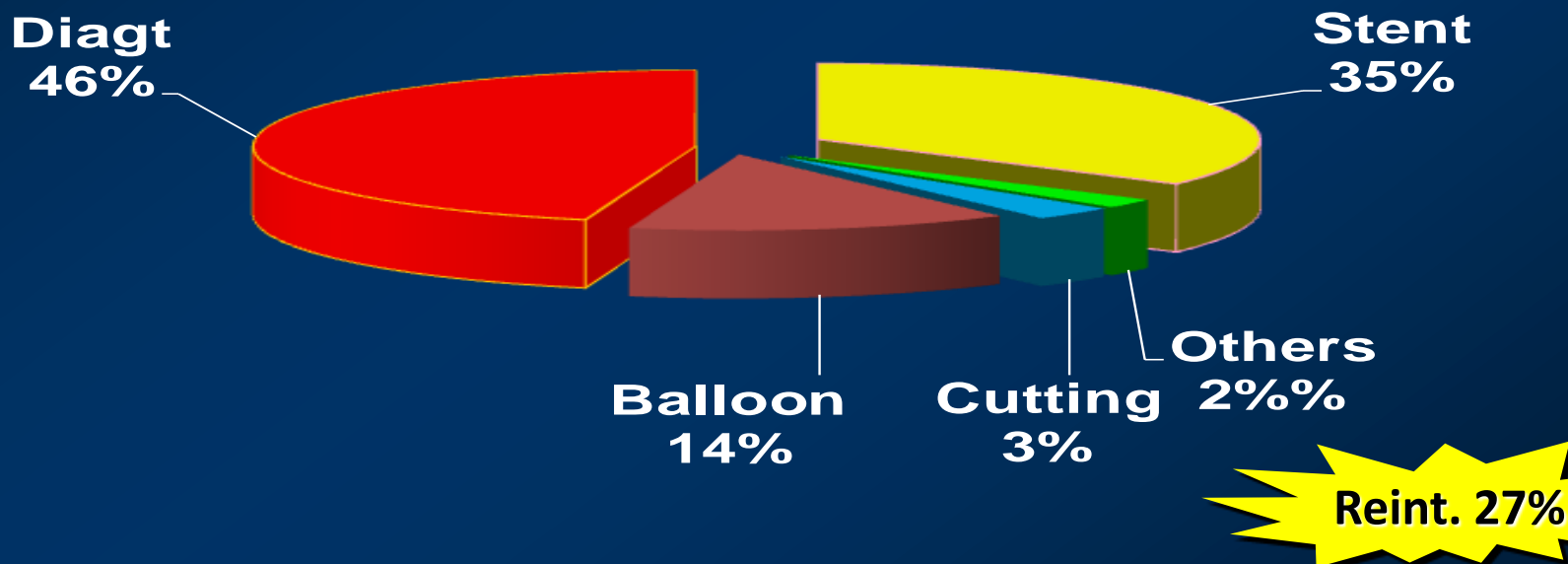
**SOLACI
SBHCI
2013**

1994 - IVUS Technique Initiation (Until – 1998 – 8.000 Evaluations)

Hospital - Foundation Costantini

IVUS 1998 -- Jan – 2013

8.045 Procedures - 22.948 IVUS Evaluations



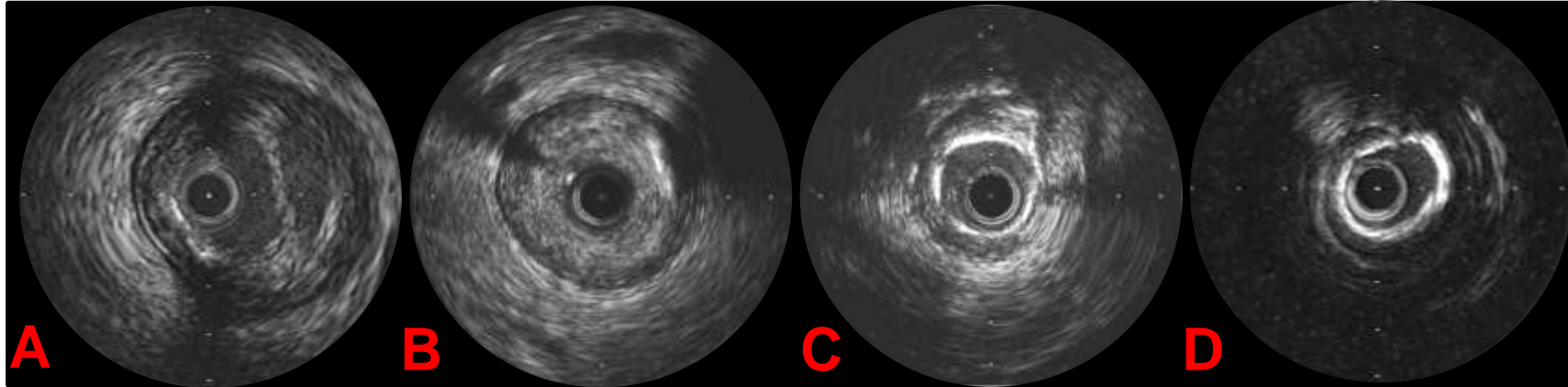
(Costantino Costantini et Cols)

The “4 Steps” Rule

- **First Step:** Characterization of the plaque
- **Second Step:** Characterization of the vessel diameter
- **Third Step:** Characterization of the plaque extension
- **Fourth Step:** Assessment of implantation quality

The 1st Step

Plaque Characterization



A. Direct Stent?

B. Balloon or Cutting Balloon Predilatation ??

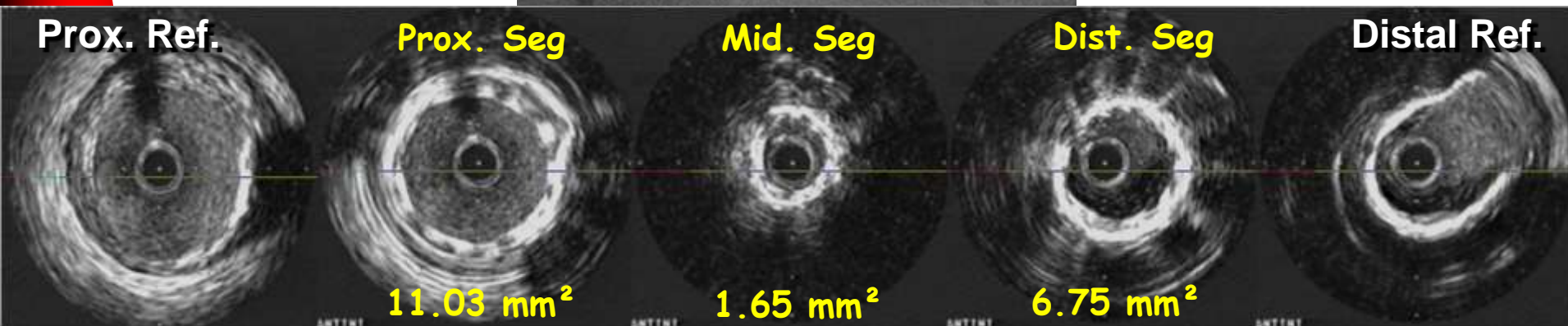
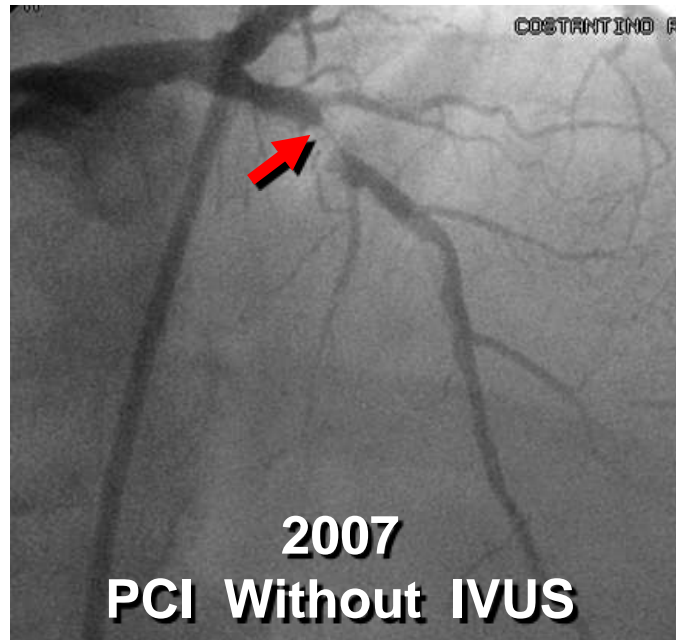
C. Cutting Balloon or Balloon Predilatation ???

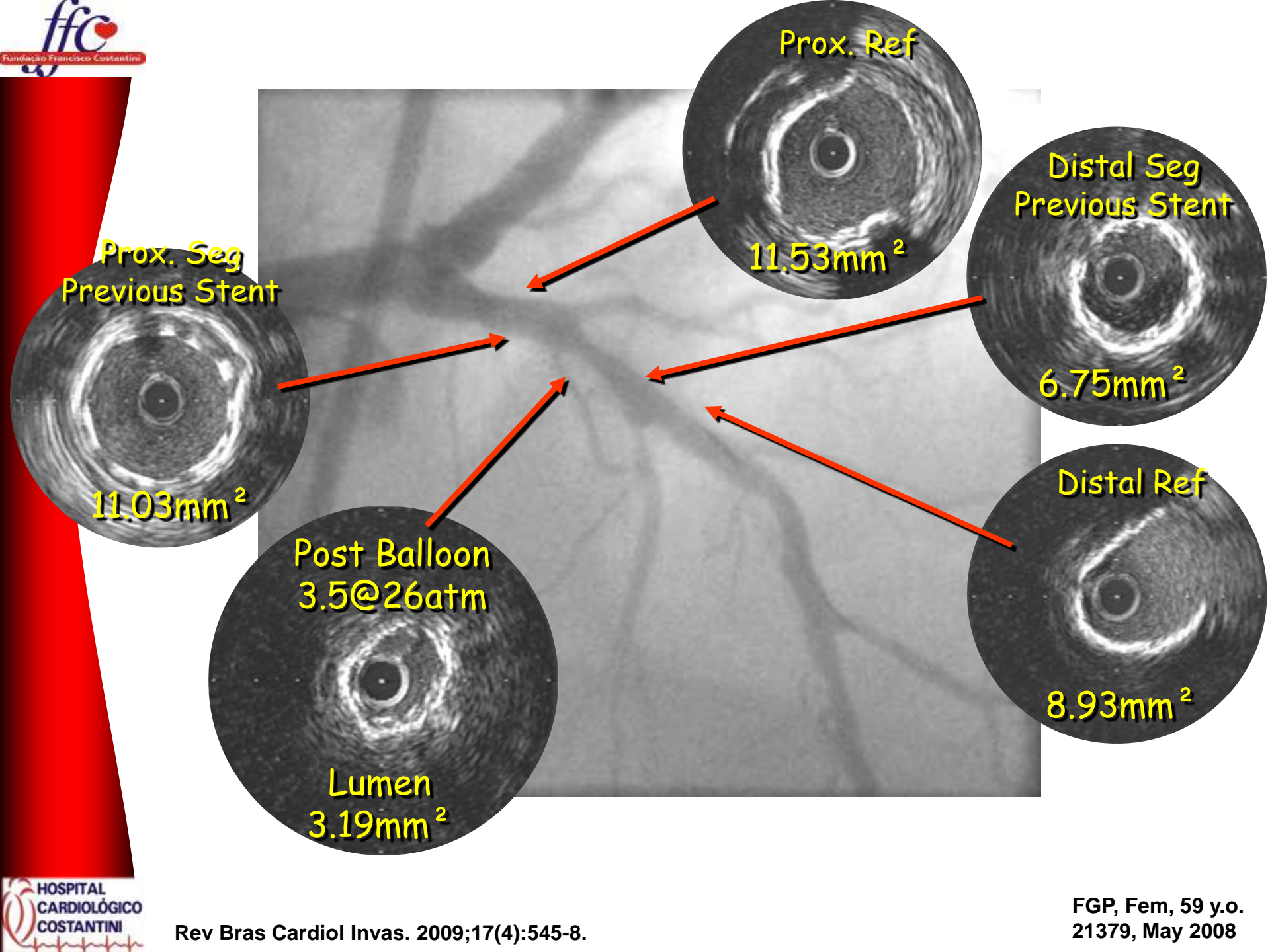
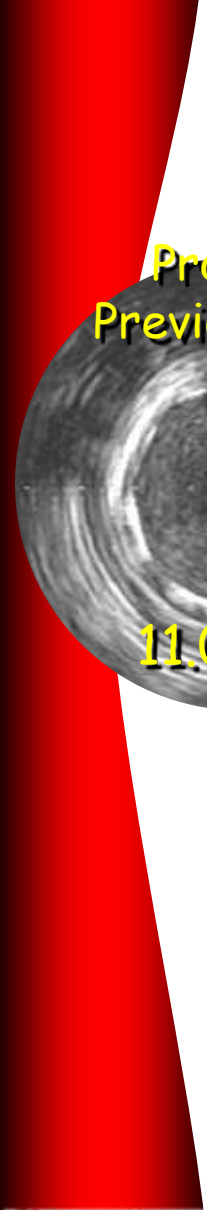
D. Plaque Modification With Rotational Atherectomy

Images from Hospital
Cardiológico Costantini

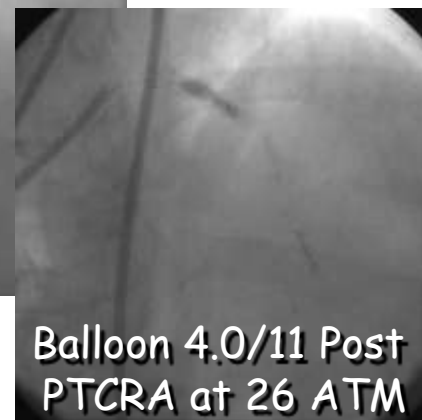
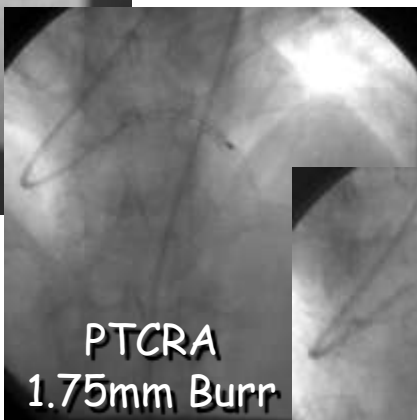
Adapted from Costantino R Costantini

Plaque Characterization !!!





Balloon
3.5/10 at 28 ATM





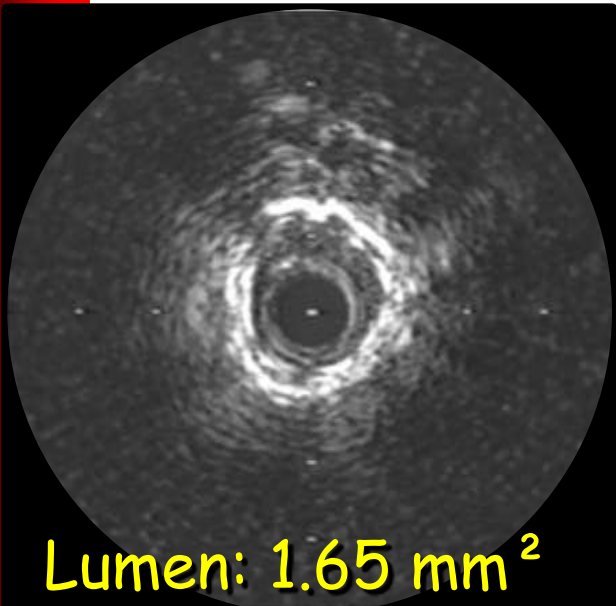
Pre Intervention



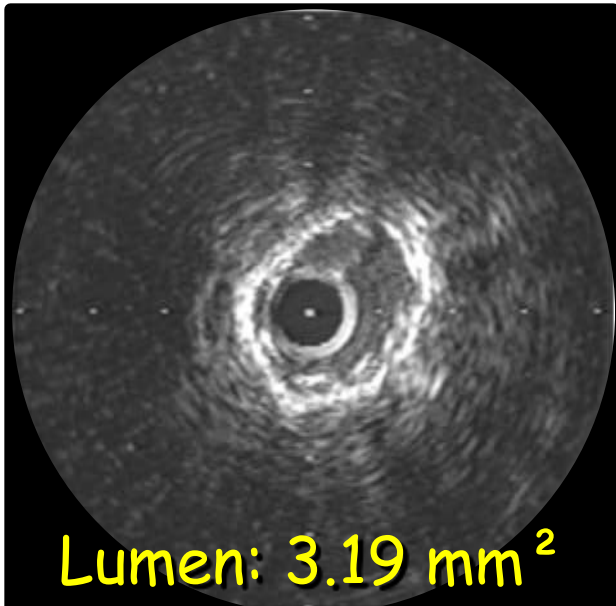
Post Balloon



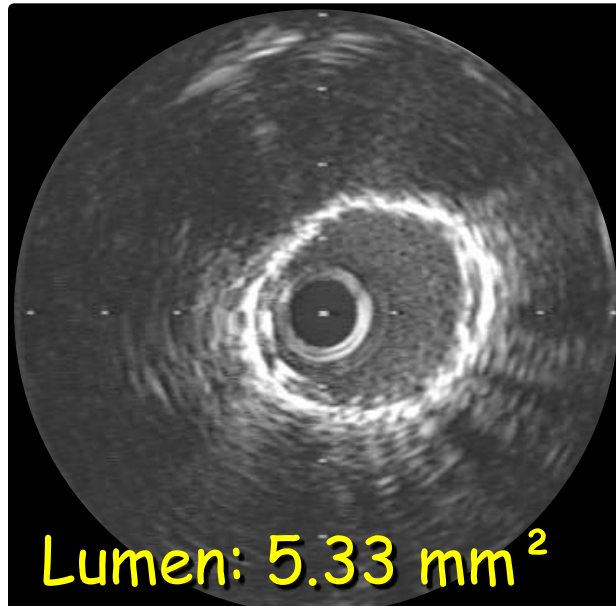
Post PTCRA + Balloon



Lumen: 1.65 mm²

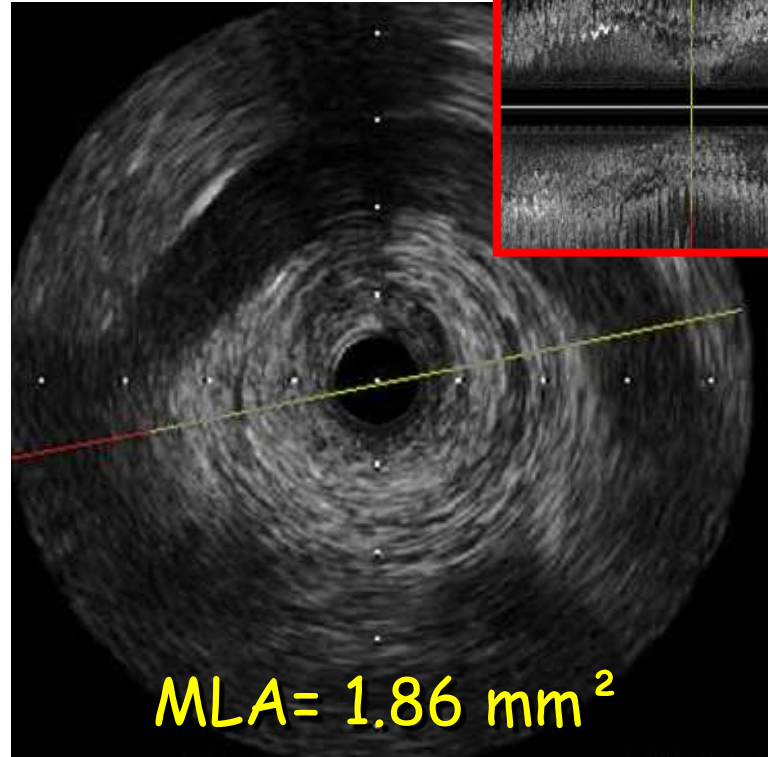
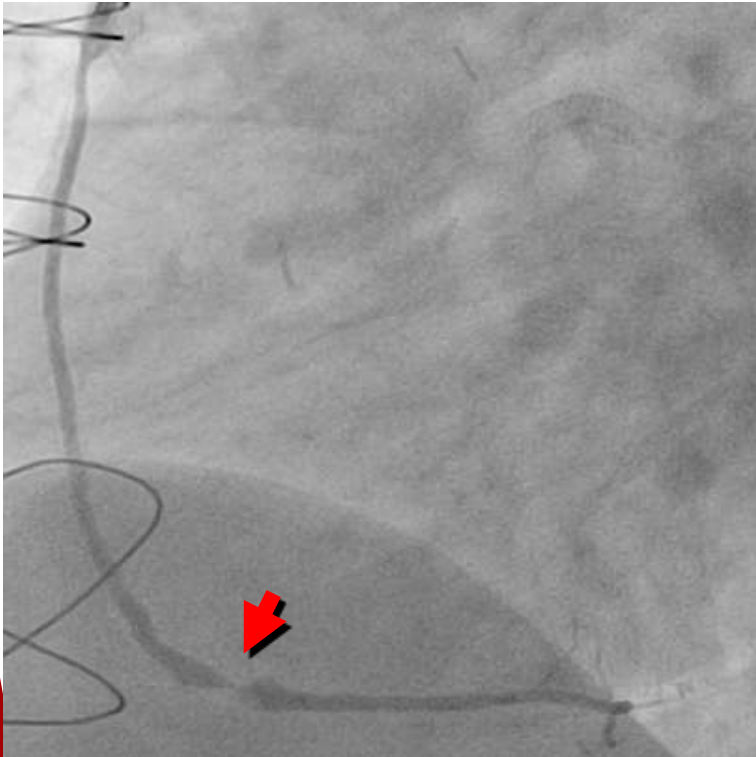


Lumen: 3.19 mm²

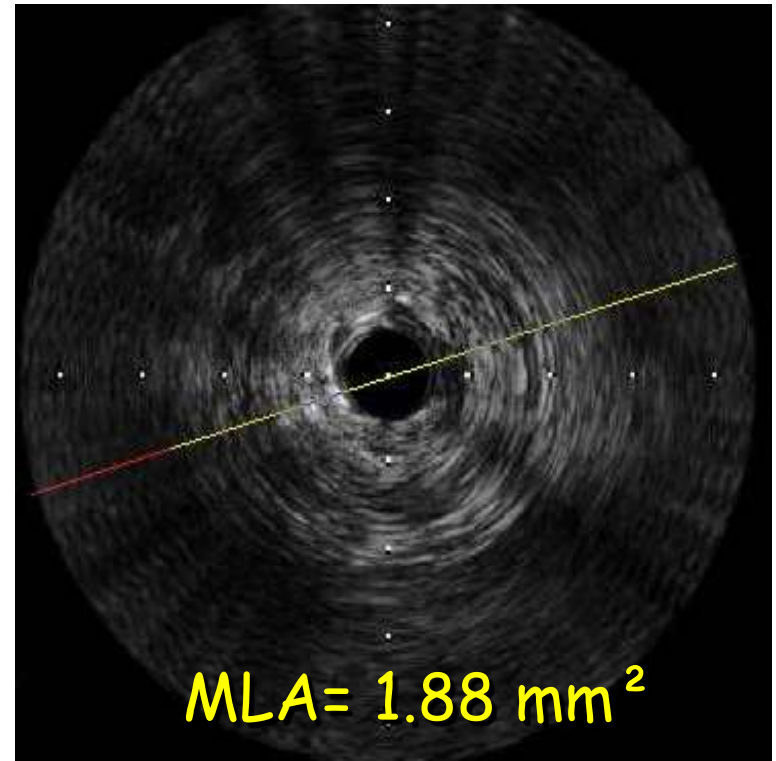
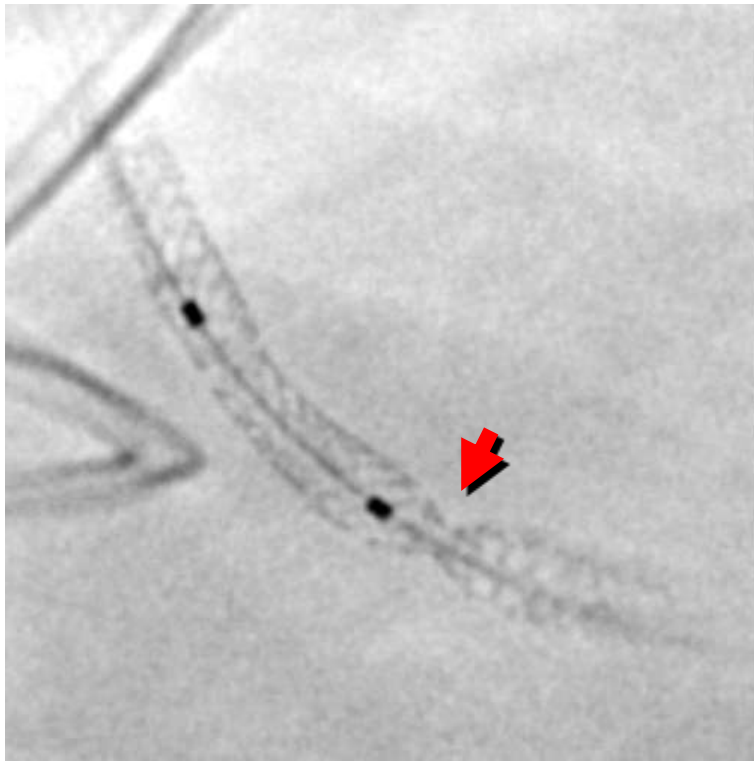


Lumen: 5.33 mm²

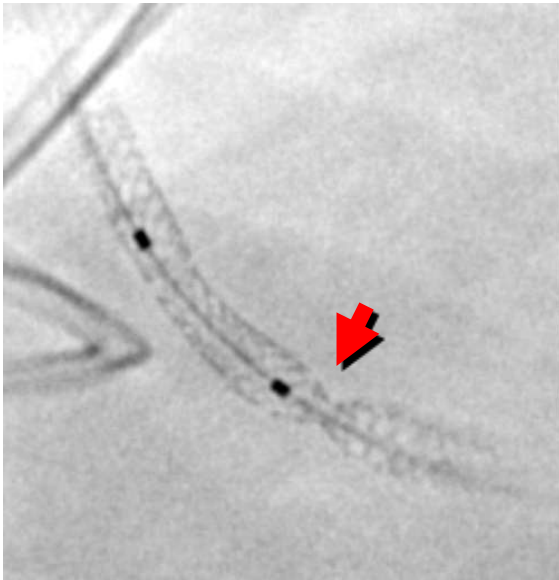
Plaque Characterization



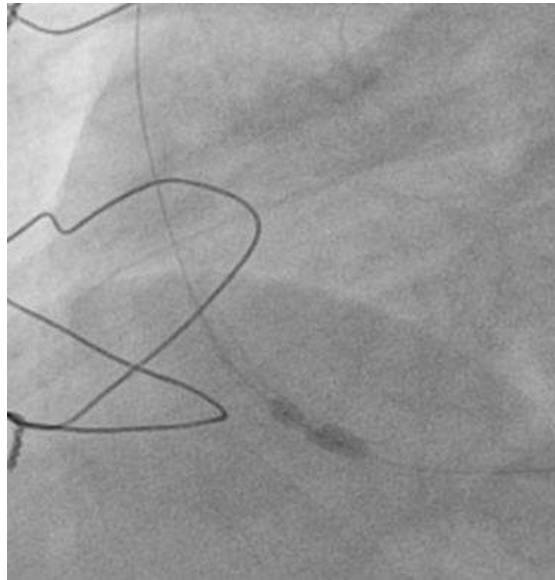
Plaque Characterization



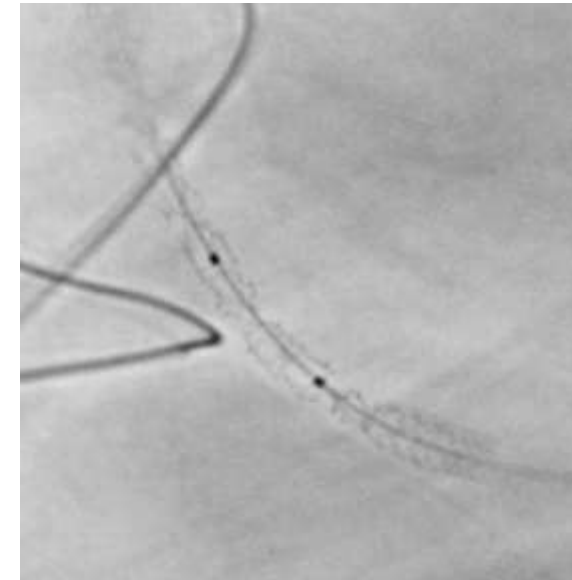
Plaque Characterization



Under
Expanded



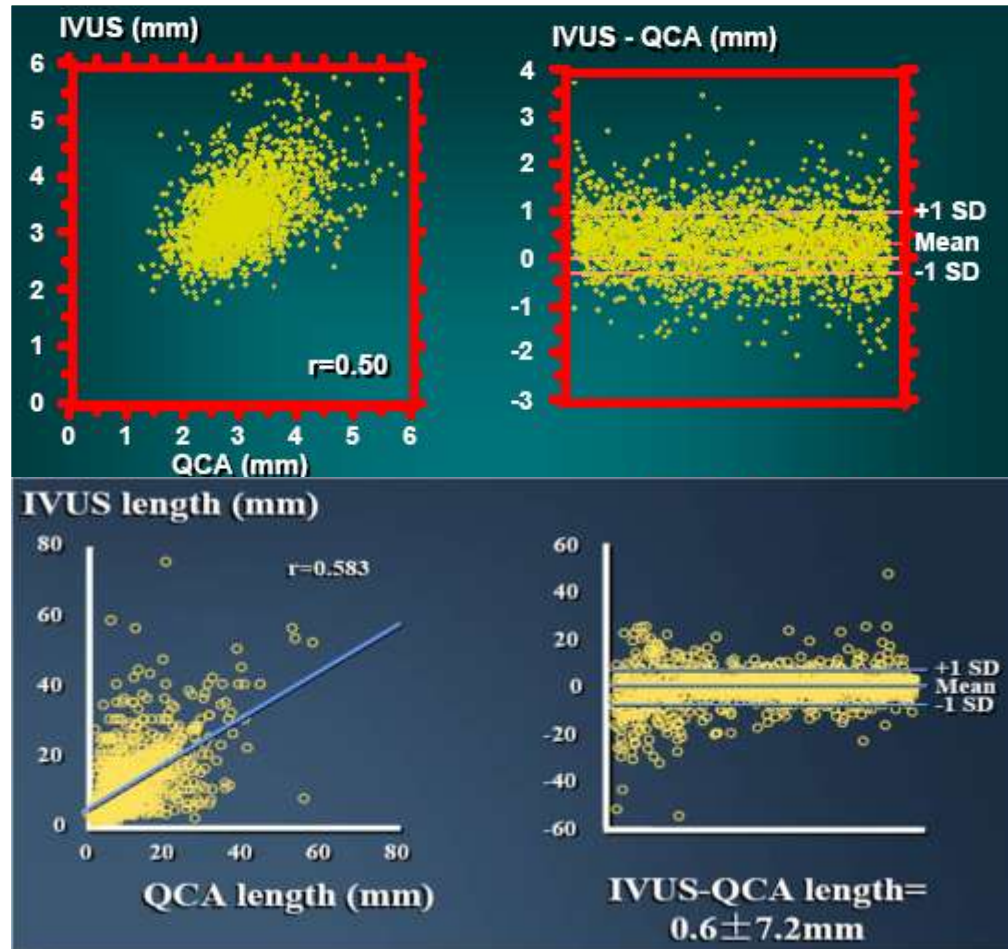
Balloon
Entrapment



Stent
Longitudinal
Disarrangement

The 2nd / 3rd Steps

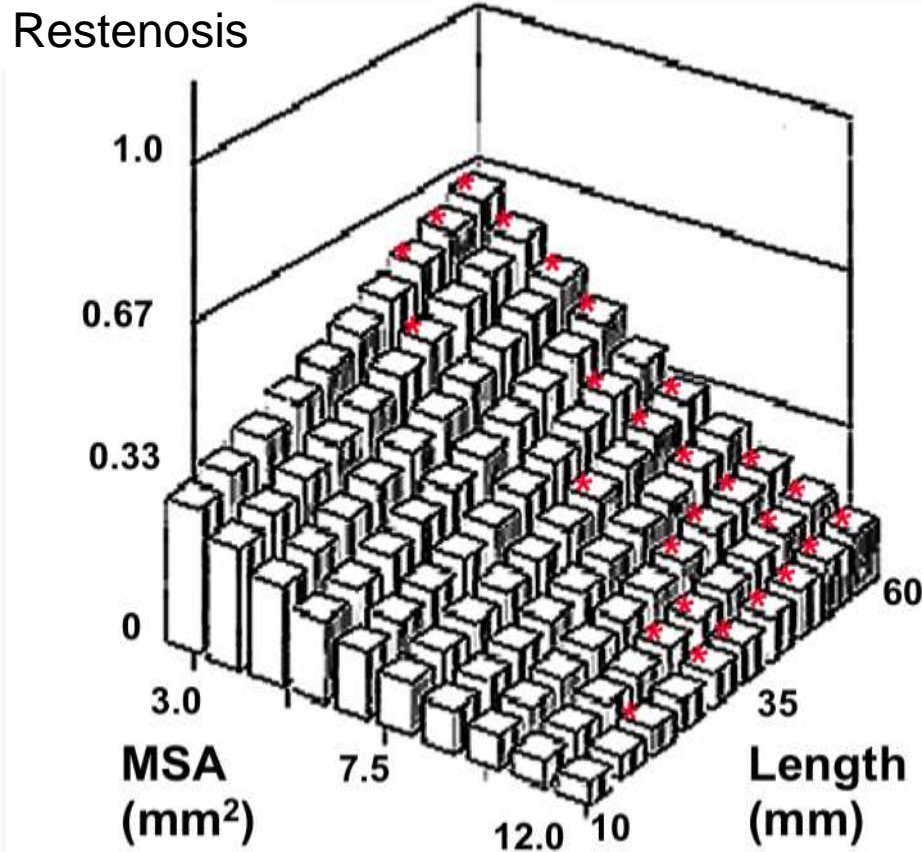
Vessel / Lesion Quantification



Lesion/Plaque Quantification

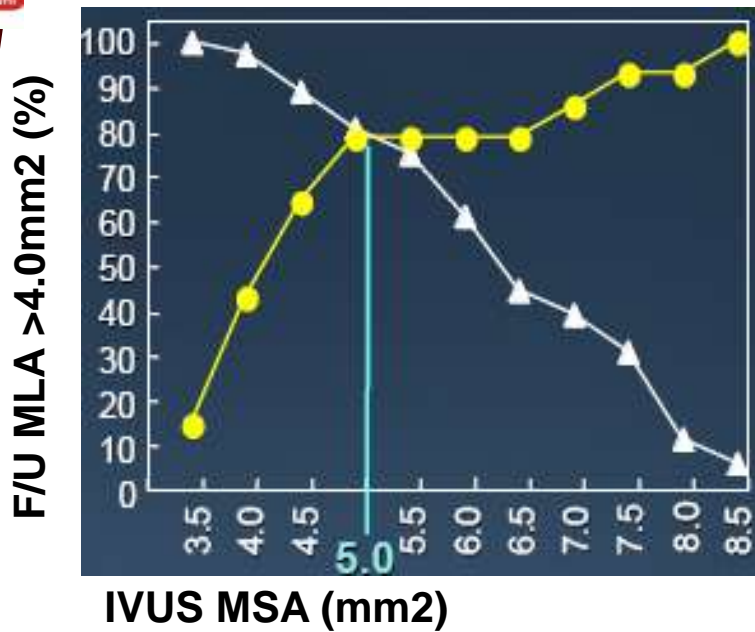
BMS

"THE BIGGER AND SHORTER IS BETTER"

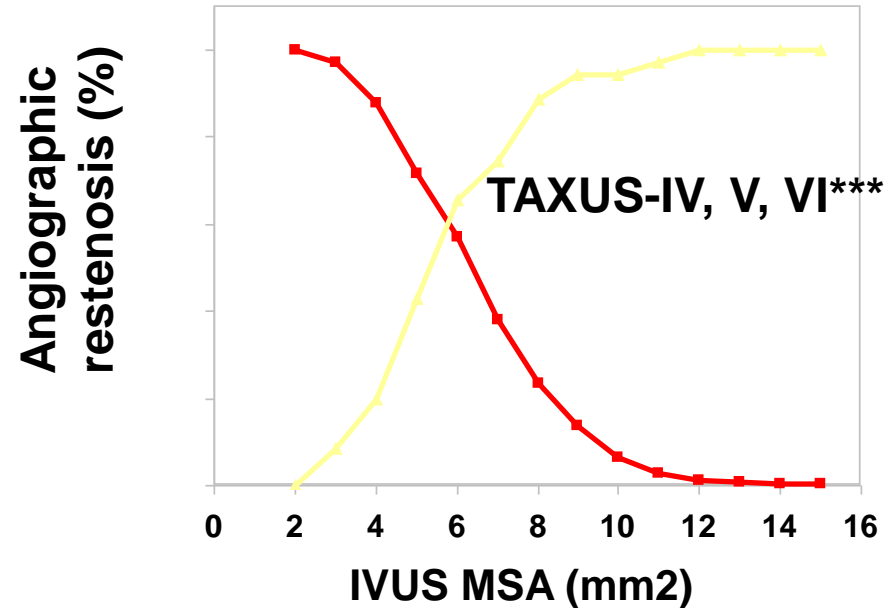
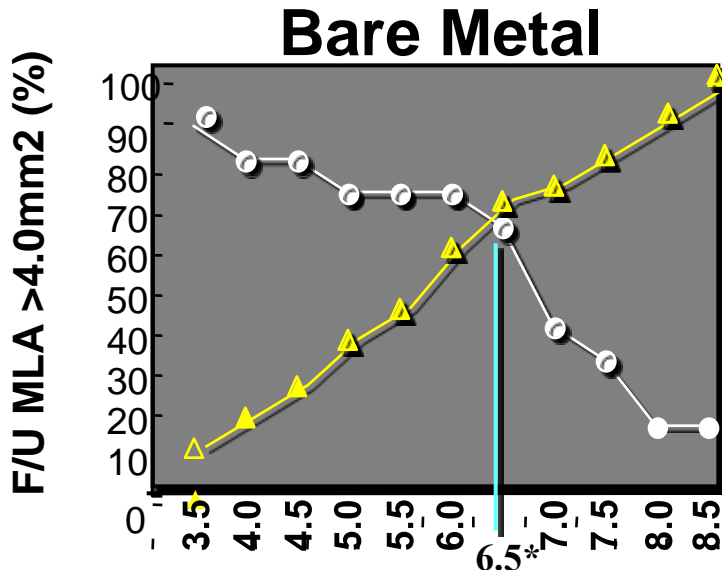
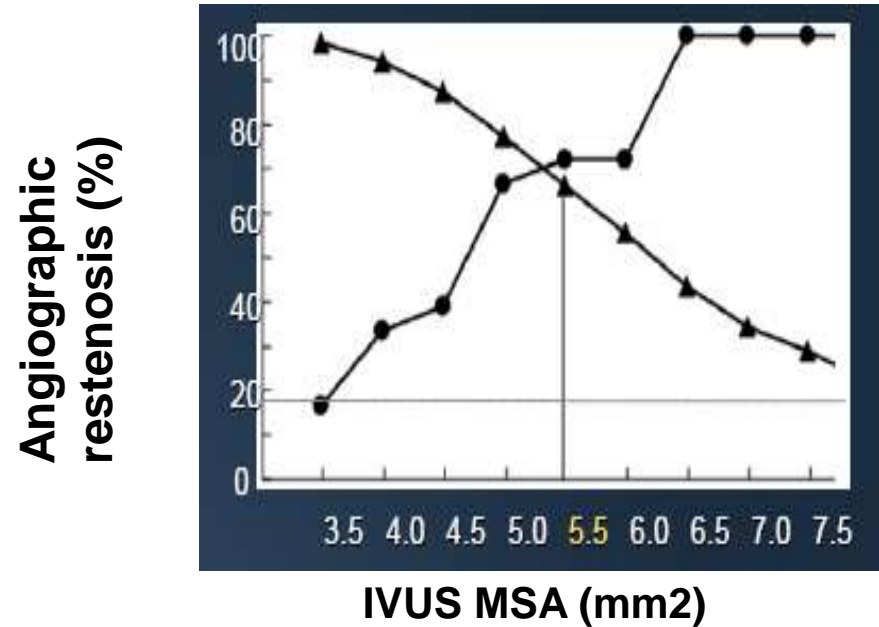


* Without real observations

Cypher in SIRIUS*



Cypher at AMC**



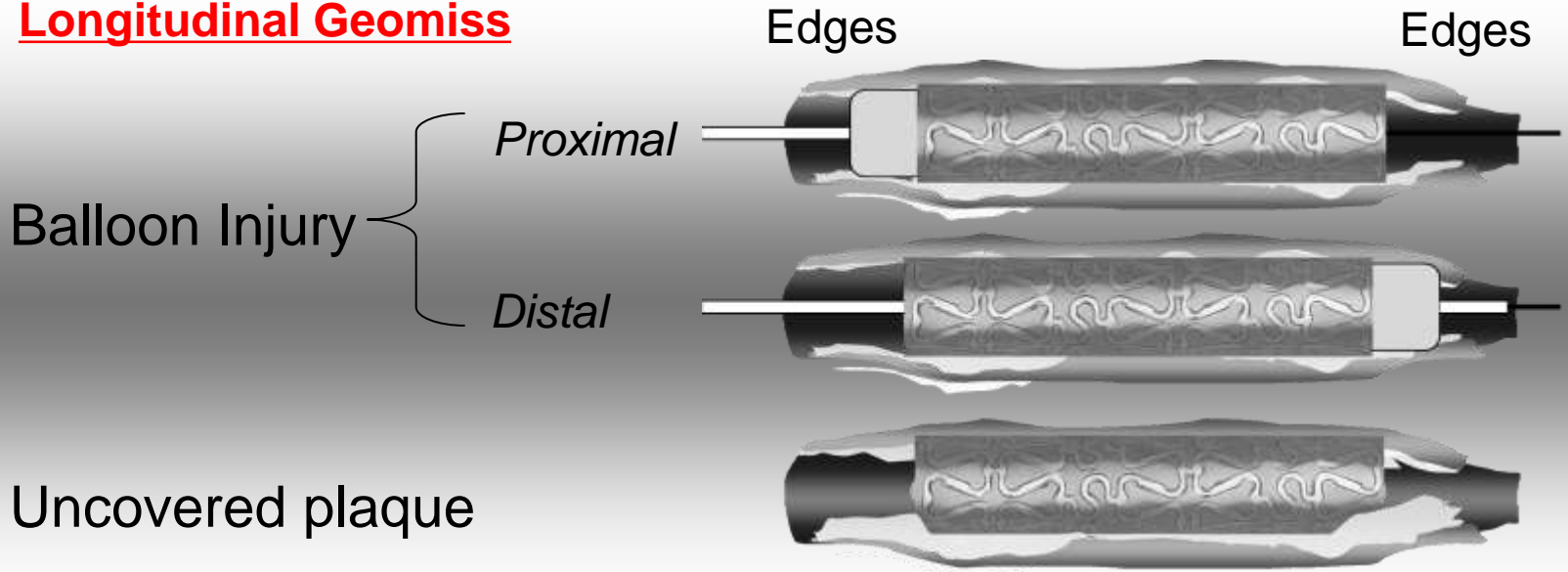
*Sonoda et al. J Am Coll Cardiol 2004;43:1959-63

Hong et al. Eur Heart J 2006;27:1305-10*TAXUS IV,V,VI Meta Analysis. N Weissman 2005

Lesion/Plaque Quantification

S.T.L.L.R. TRIAL

Longitudinal Geomiss



Axial Geomiss

Stent/Balloon: Artery ≤ 0.9



Stent/Balloon: Artery > 1.3



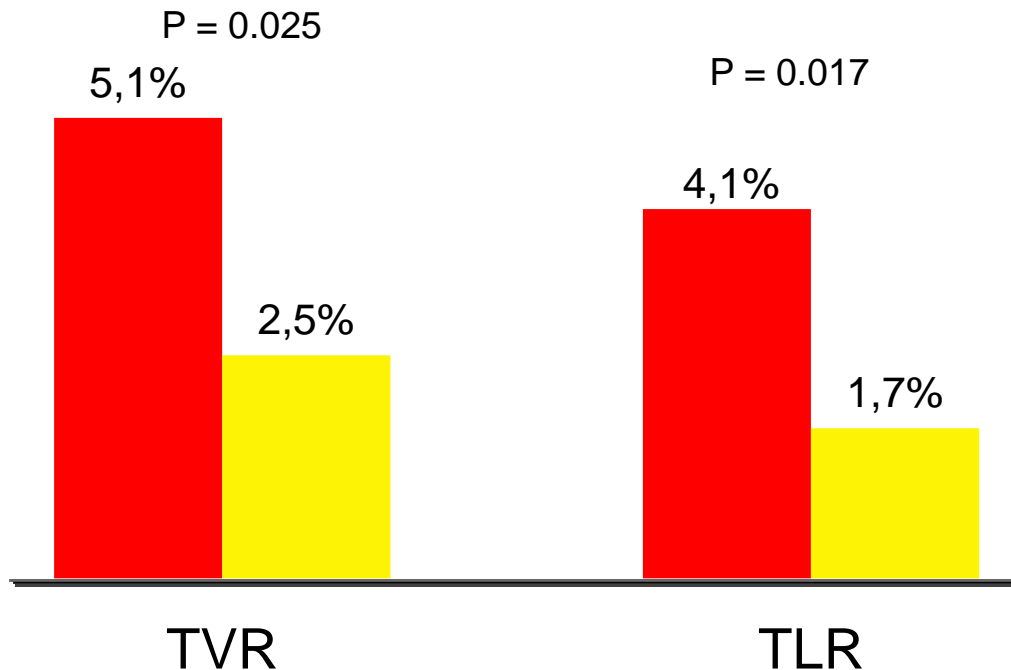
Lesion/Plaque Quantification!!!

S.T.L.L.R. TRIAL

1-Year Efficacy End-Points

- Geographic Miss (n = 943)
- No Geographic Miss (n = 473)

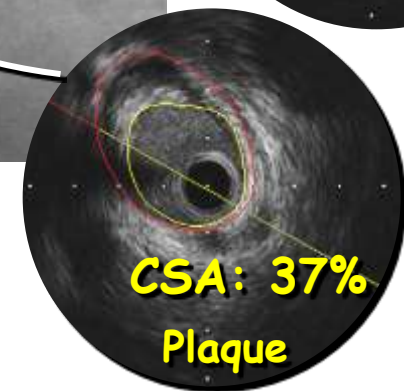
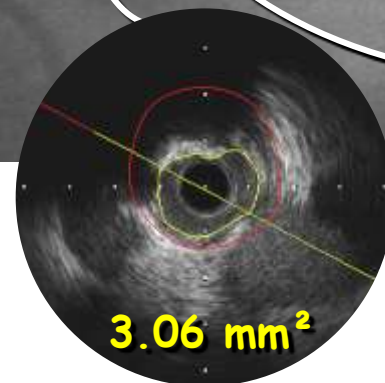
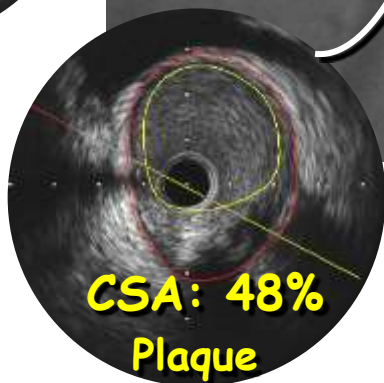
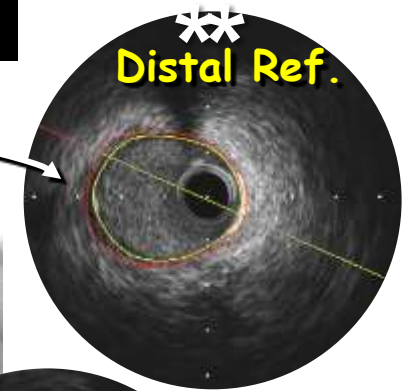
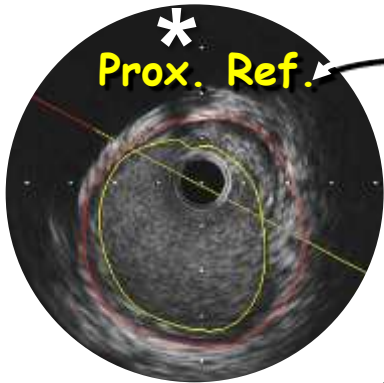
2/3 of patients



IVUS Marking Technique



QCA: 9.16 mm / IVUS: 20 mm



IVUS Marking Technique

Strategy

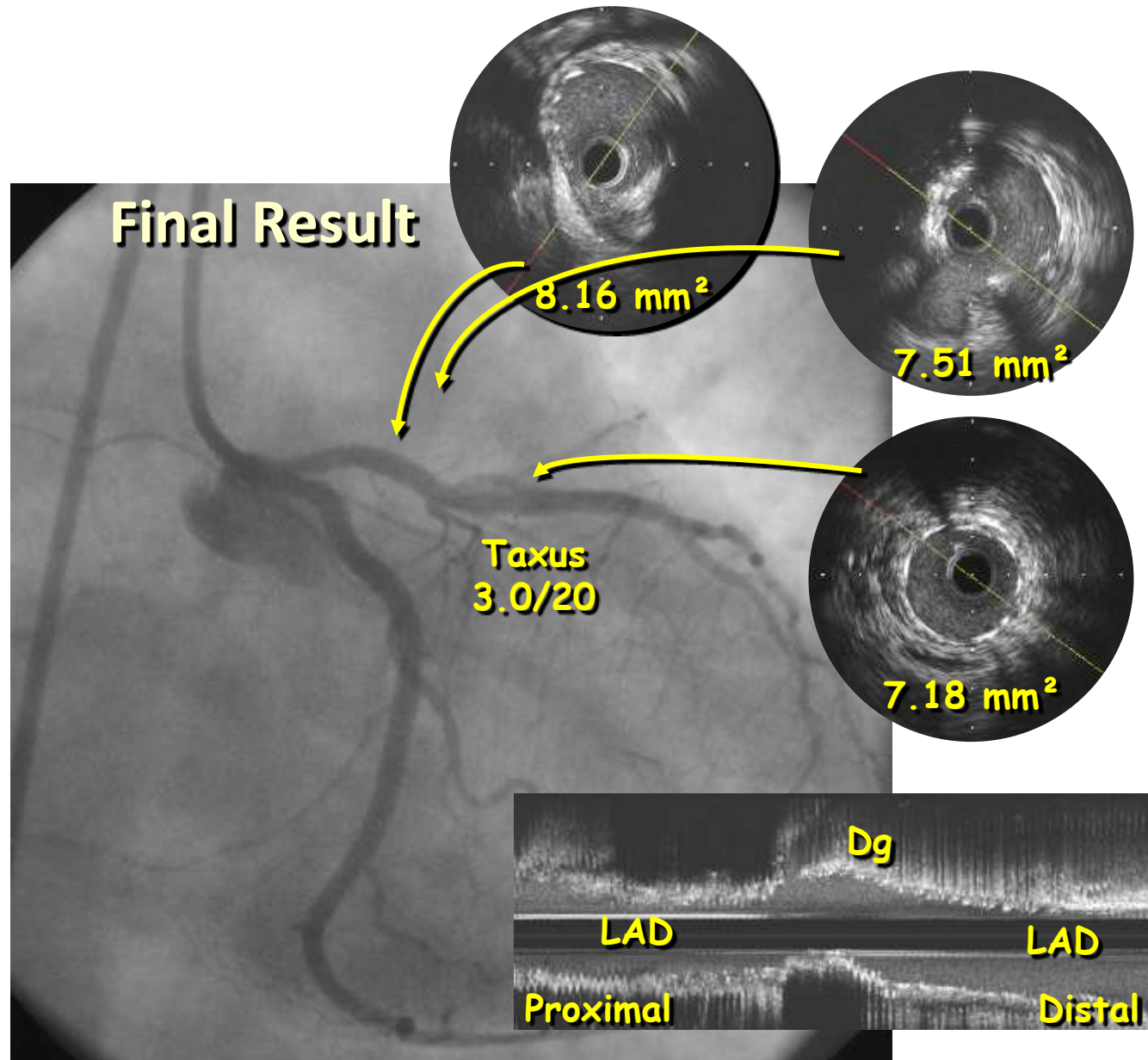
3.0/12 at 16 ATM

Balloon Pre Dilat.

Stent 3.0/20 mm
at 6 ATM

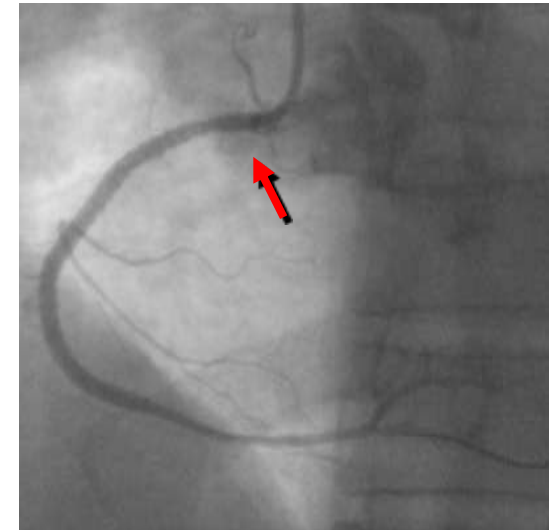
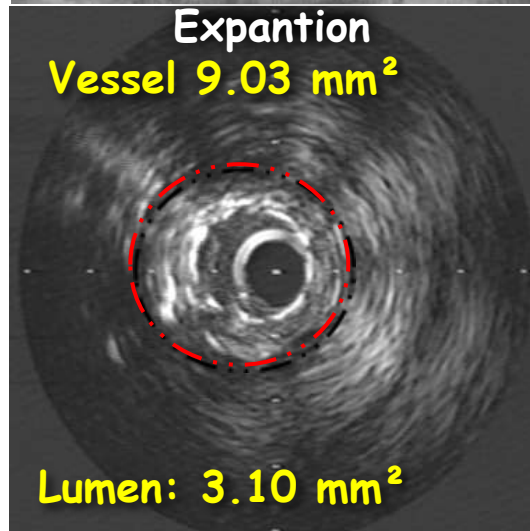
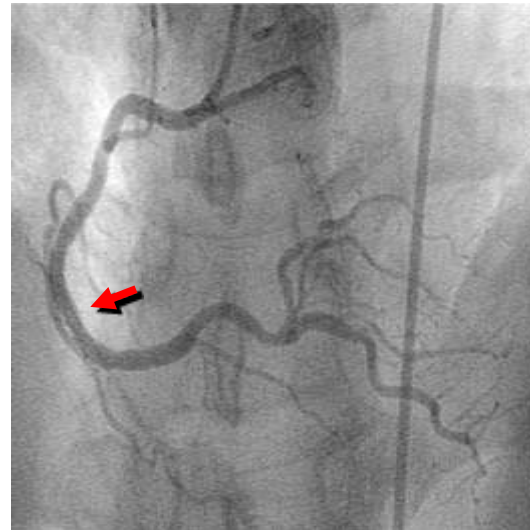
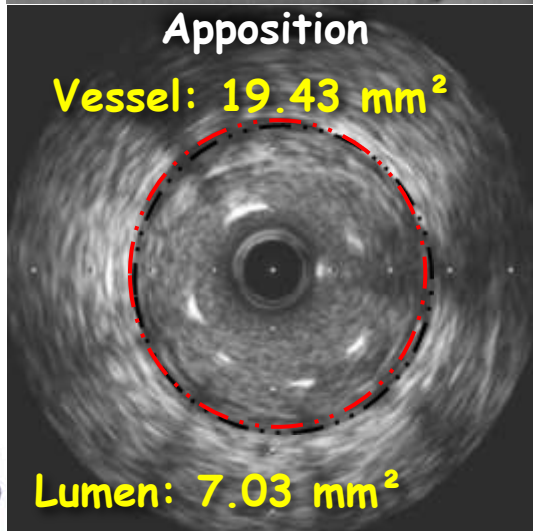
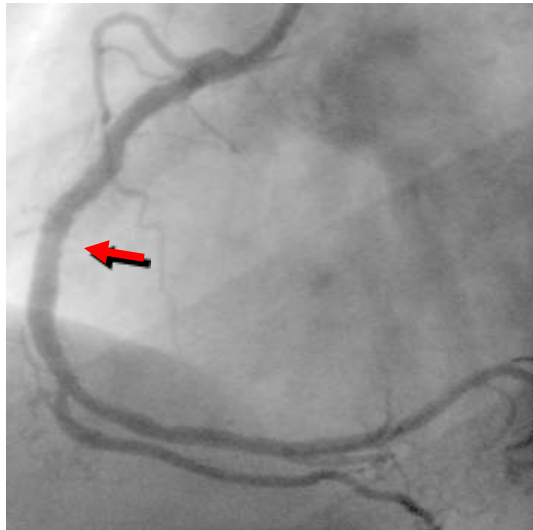
3.0/12 at 20 ATM

Balloon Post Dilat.



The 4th Step

Assessment of Stent Implantation



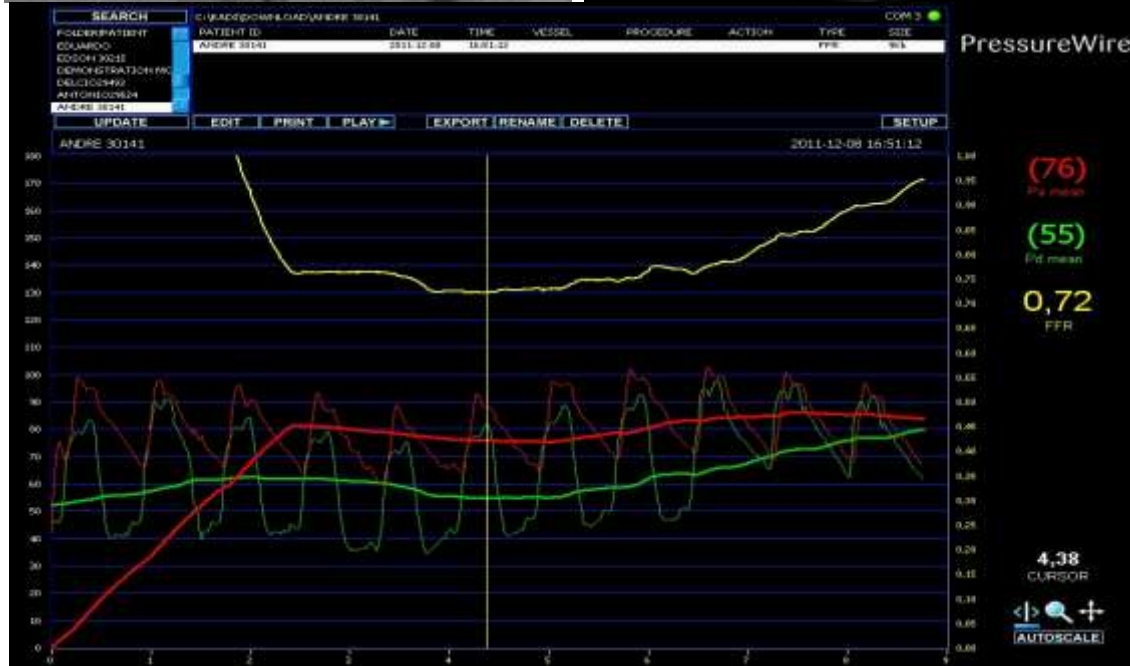
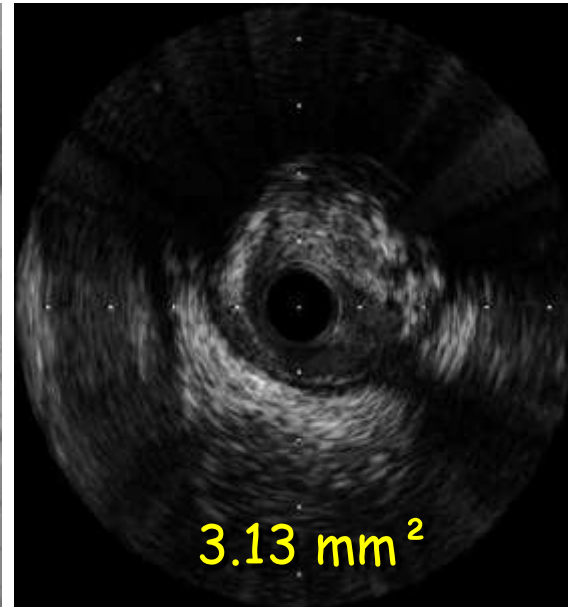
Assessment of Stent Implantation

IVUS Predictors of DES Complications

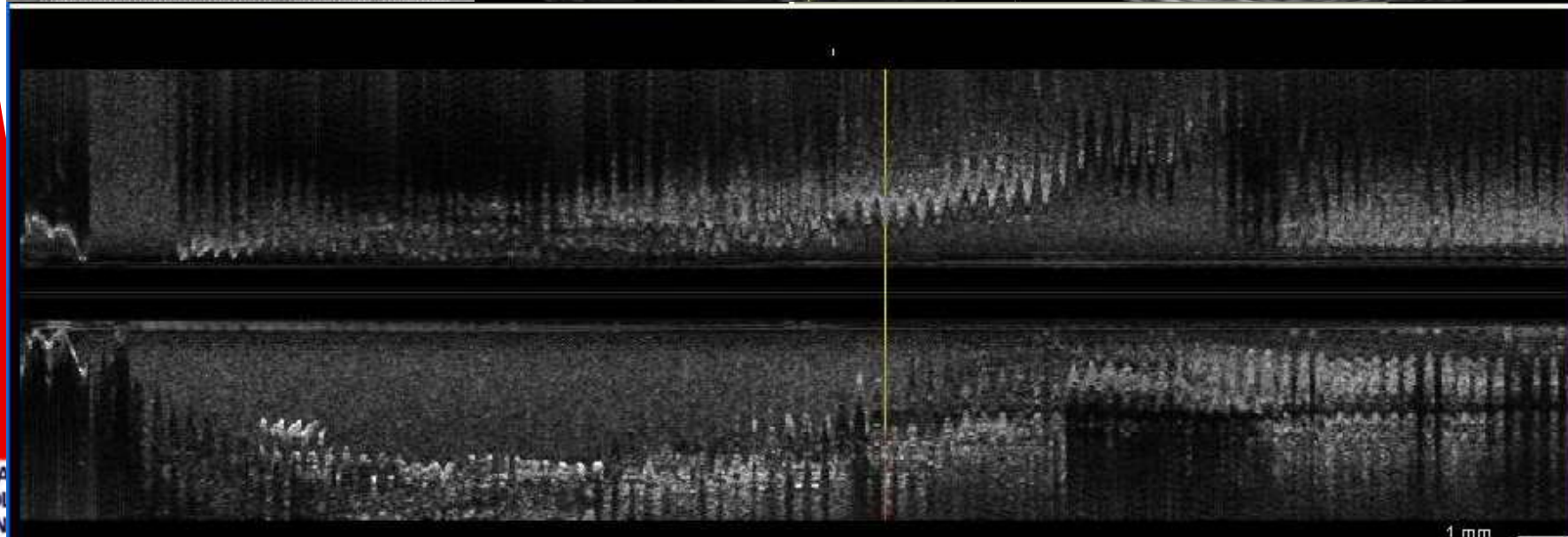
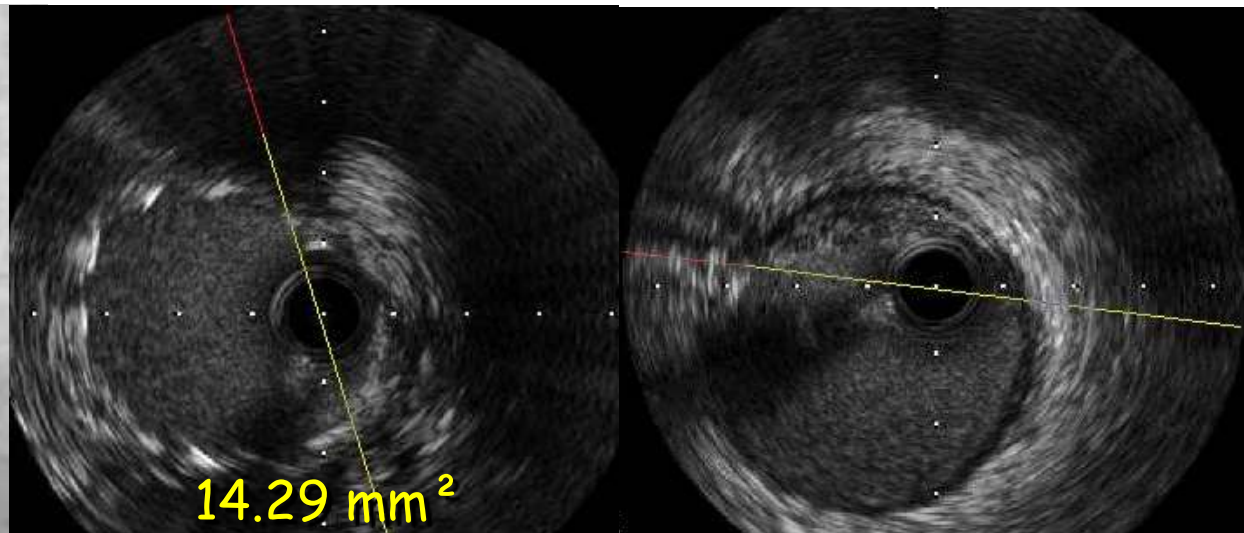
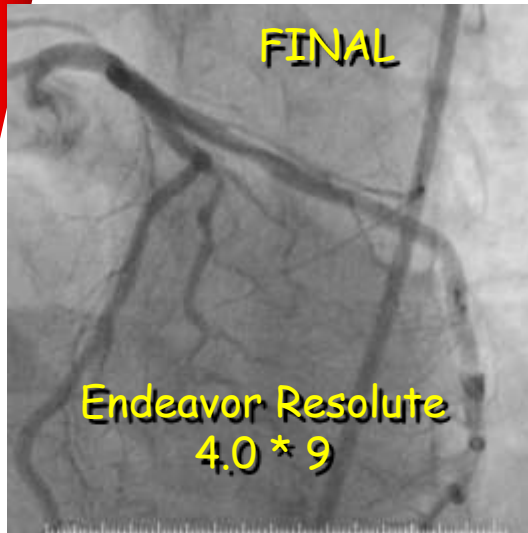
	• DES Thrombosis	• DES Restenosis
Underexpansion (CSA \leq 5 mm ²)	<ul style="list-style-type: none"> • Fujii et al. J Am Coll Cardiol 2005;45:995-8 • Takebayashi et al, AJC 2005 • Kim et al AJC, 2006 • Okabe et al., Am J Cardiol. 2007;100:615-20 • Liu et al. JACC Interventions 2009;2:428-34 	<ul style="list-style-type: none"> • Sonoda et al. J Am Coll Cardiol 2004;43:1959-63 • Fujii et al. Circulation 2004; 109:1085-1088 • Hong et al. Eur Heart J 2006; 27:1305-10 • TAXUS IV, V, VI and ATLAS WH, LL, DS meta-analysis. JACC CardiovascInterv. 2009;2:1269-75 • Doi et al. JACC Cardiovasc Interv. 2009;2:1269-75
Peri-stent optimization - Remained lesions - Geographic miss - Large plaque burden...	<ul style="list-style-type: none"> • Fujii et al. J Am Coll Cardiol 2005;45:995-8 • Okabe et al., Am J Cardiol. 2007;100:615-20 • Liu et al. JACC Interventions 2009;2:428-34 	<ul style="list-style-type: none"> • Sakurai et al. Am J Cardiol 2005; 96:1251-3 • Costa et al, Am J Cardiol, 2008; 101:1704-11 • Liu et al, Am J Cardiol, 2009;103:501-6

Step by Step: IVUS, Case Analysis and Resolution

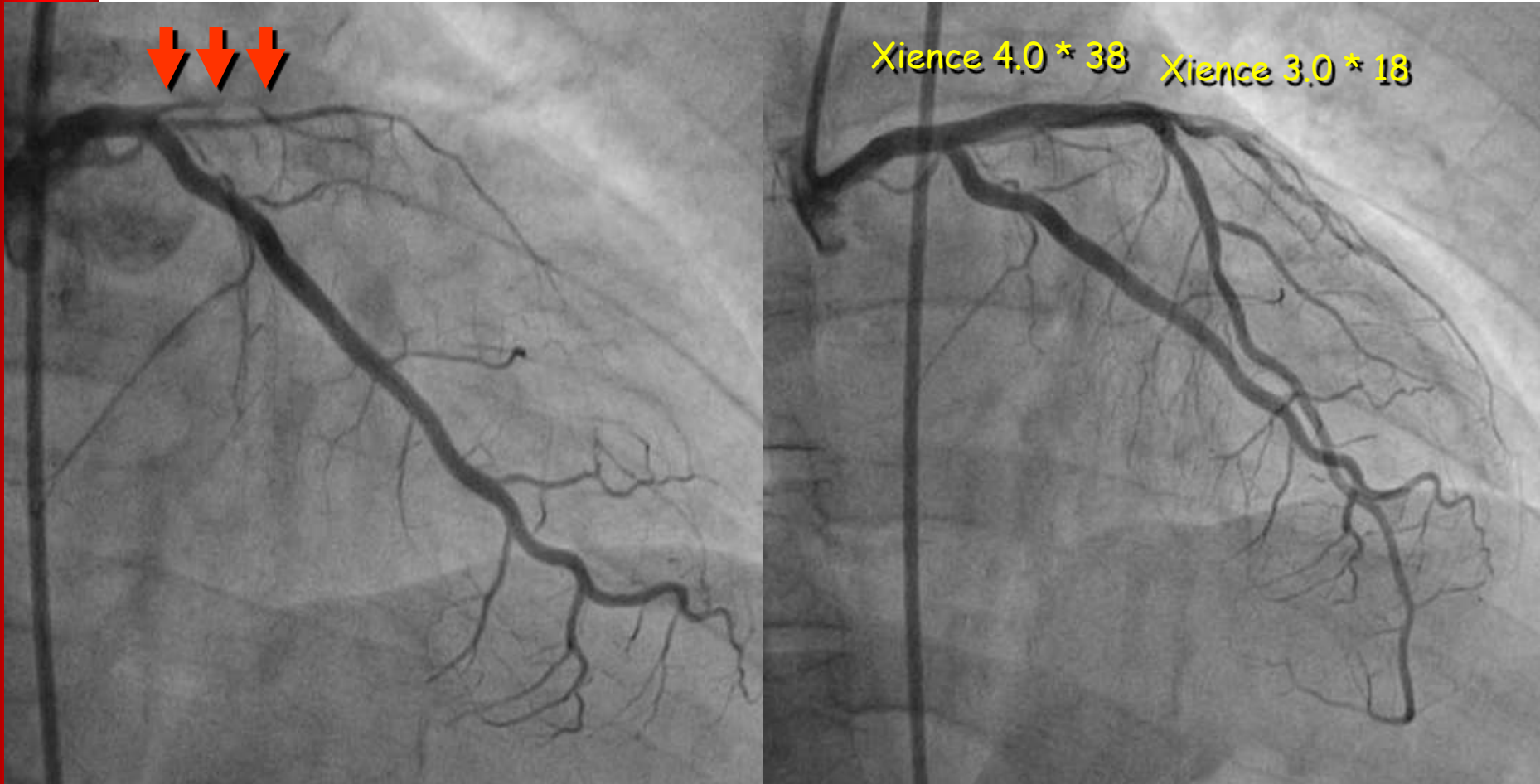
AP, ♂
45yrs
Prog Angina
30141
08Dec11



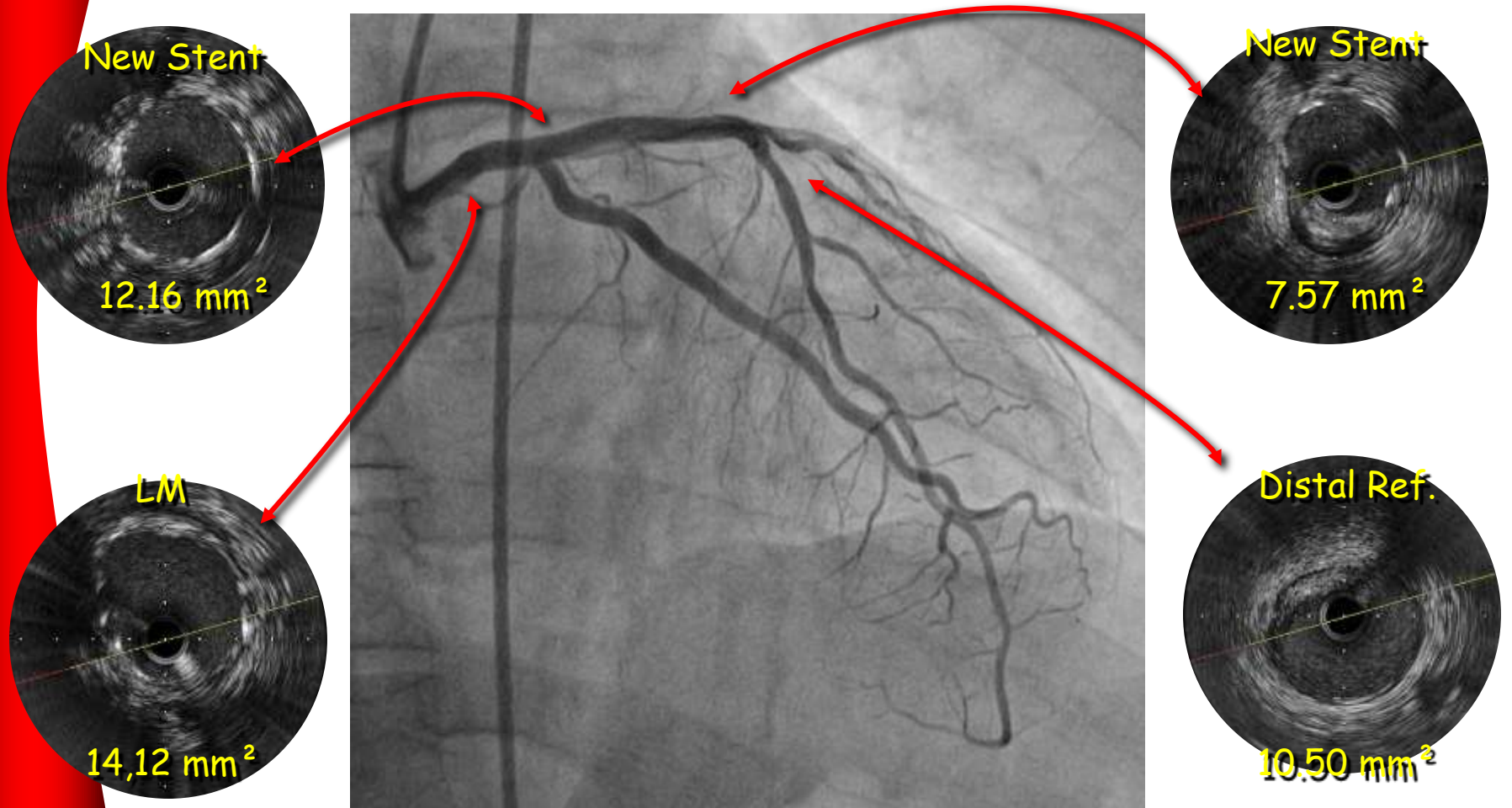
Step by Step: IVUS, Case Analysis and Resolution



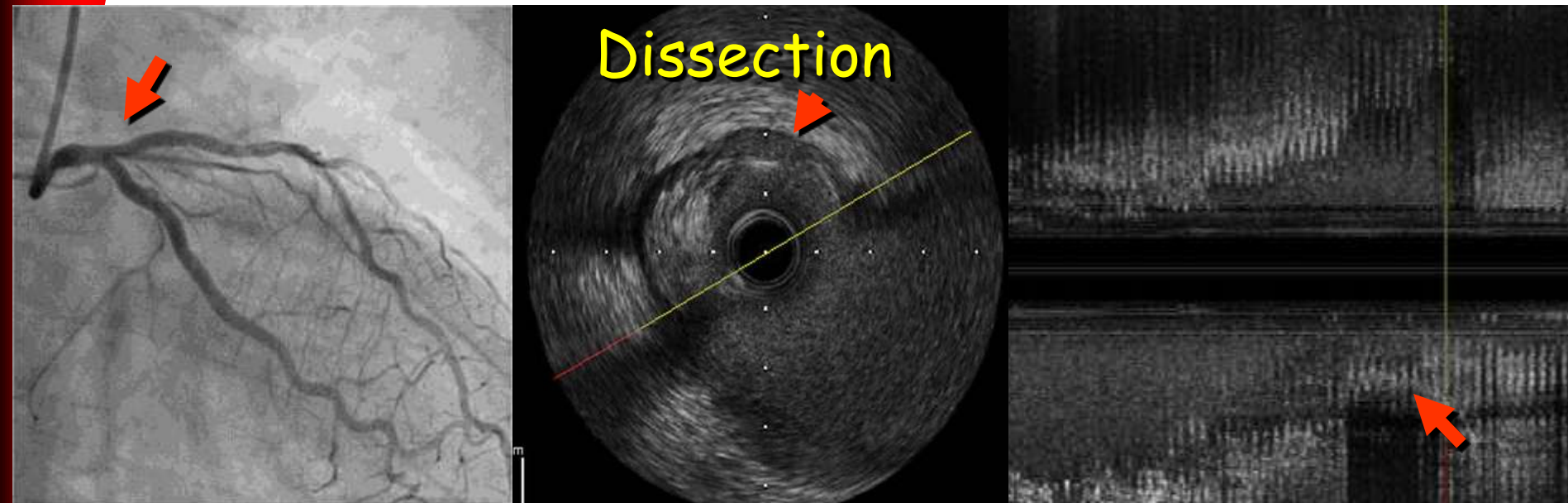
AMI - After 1h30 post Stent in LM



Final Result

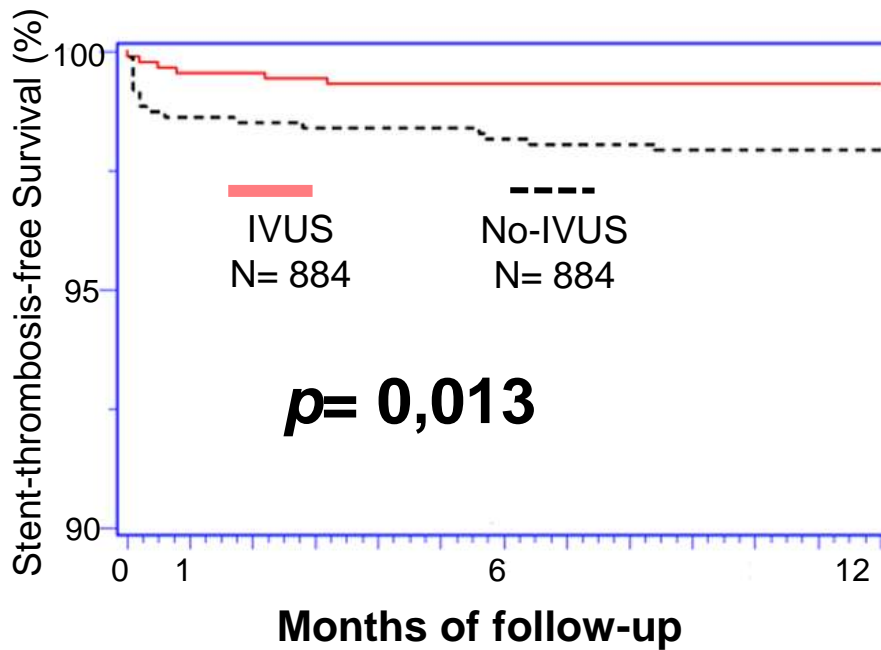


Understanding What Happened It was not the DES!!!

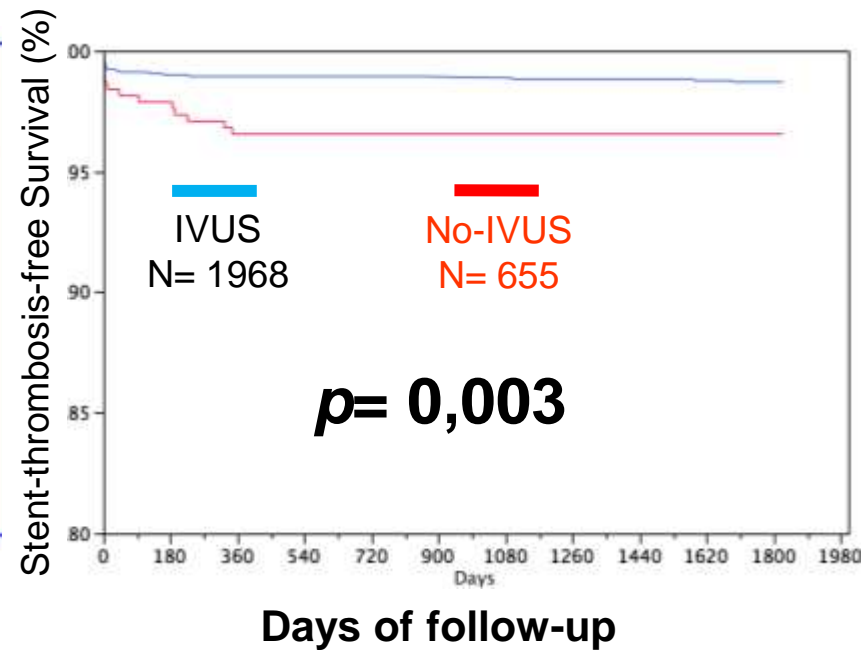


The “4 Steps” Rule

Clinical Impact of IVUS Guided DES PCI



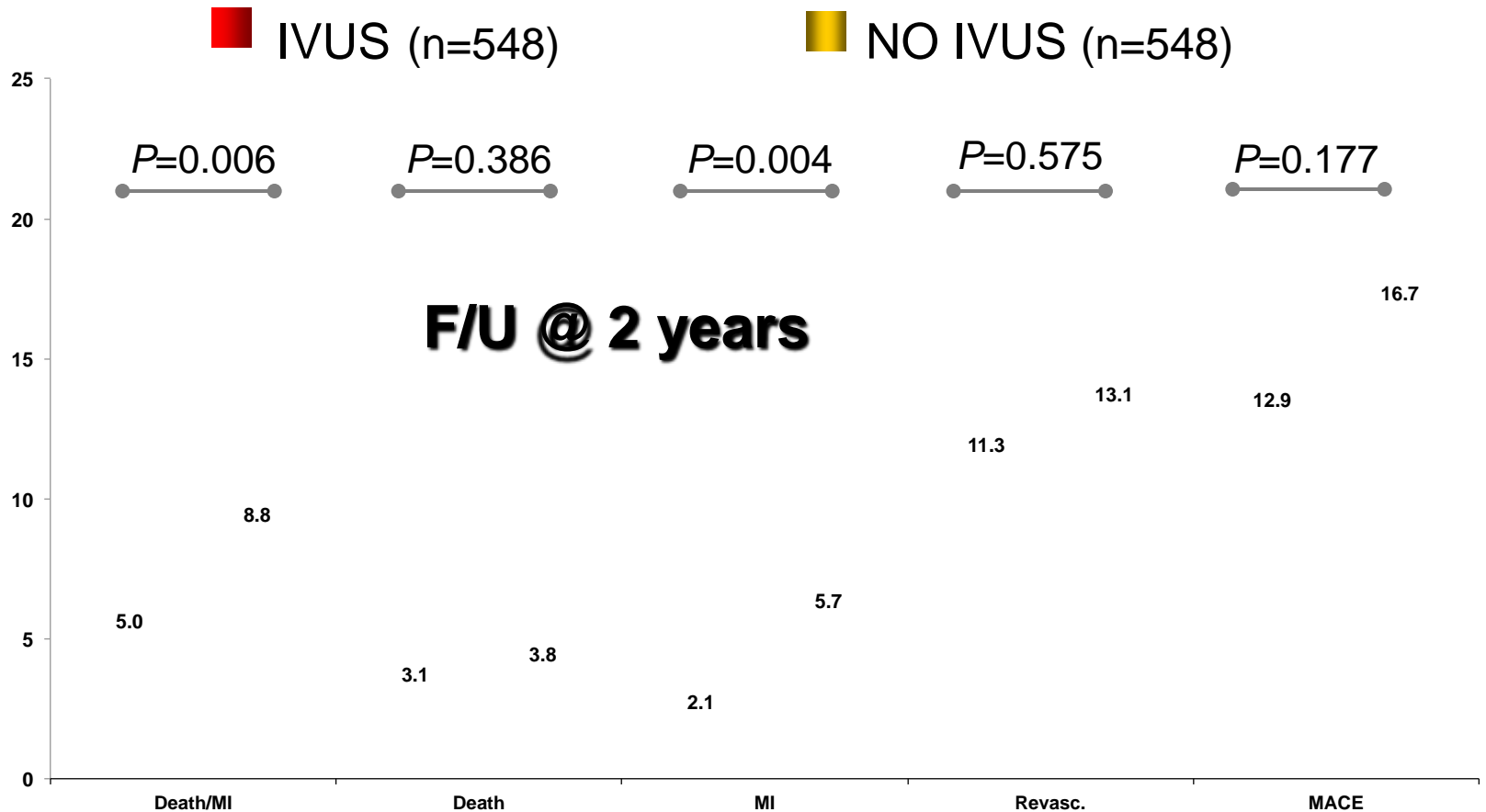
(Roy et al. Eur Heart J. 2008;29:1851-7)



(Costantini et al. TCT 2008)

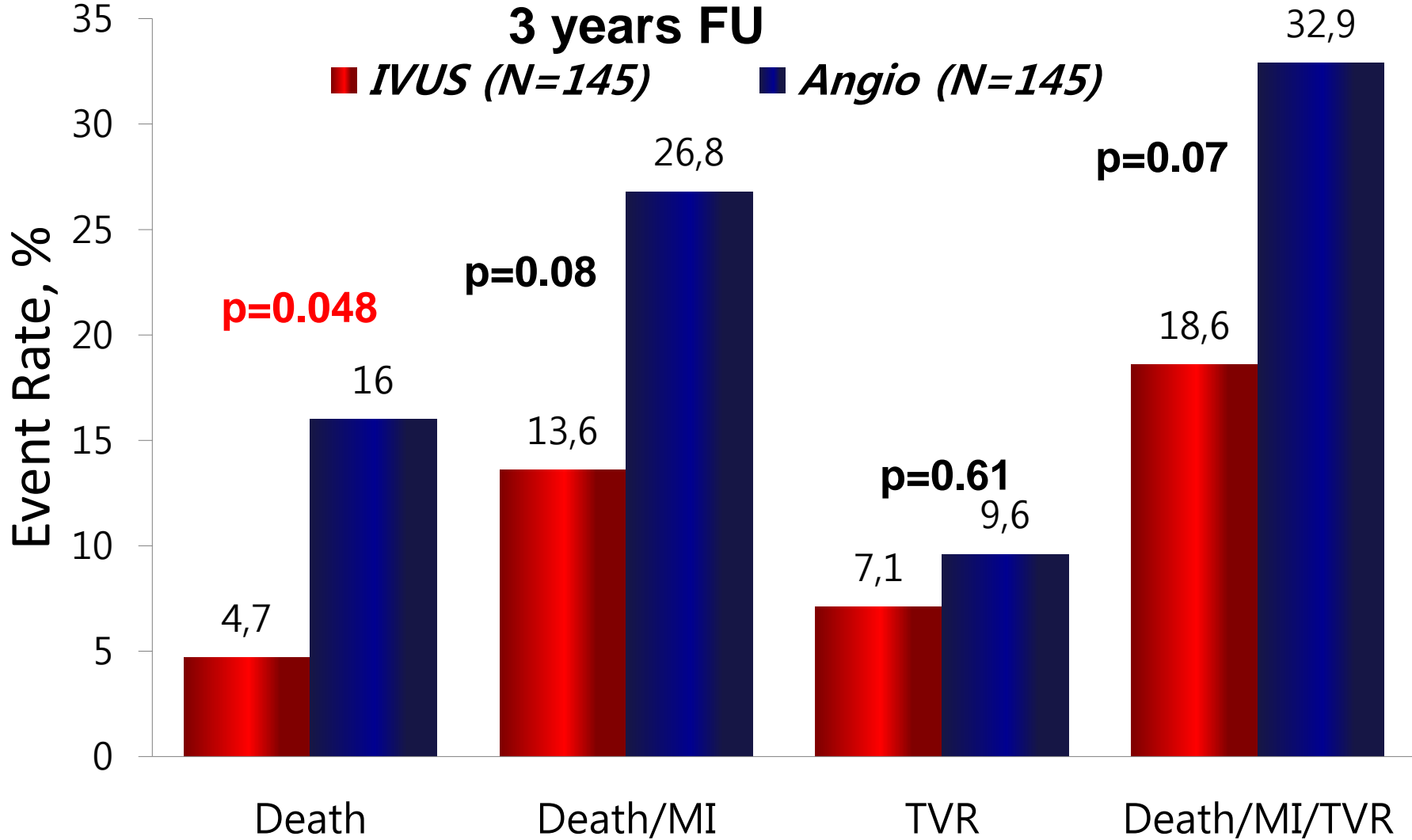
The “4 Steps” Rule

Clinical Impact of IVUS Guided DES PCI



IVUS for LMT DES

Propensity Matching Score



2013



Cardio Interv

2013

**13th INTERNATIONAL INTERVENTIONAL
CARDIOLOGY SYMPOSIUM**

29 Nov - 30 Dec 2013

Curitiba.PR.Brazil

**Conferences, discussions, round tables
and live cases.**

Organization



**Fundação
Francisco Costantini**

Suport



Conclusions