2013 TCTAP

Wrap-Up Interview

FFR and IVUS in Clinical Practice

Moderator

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Interviewees

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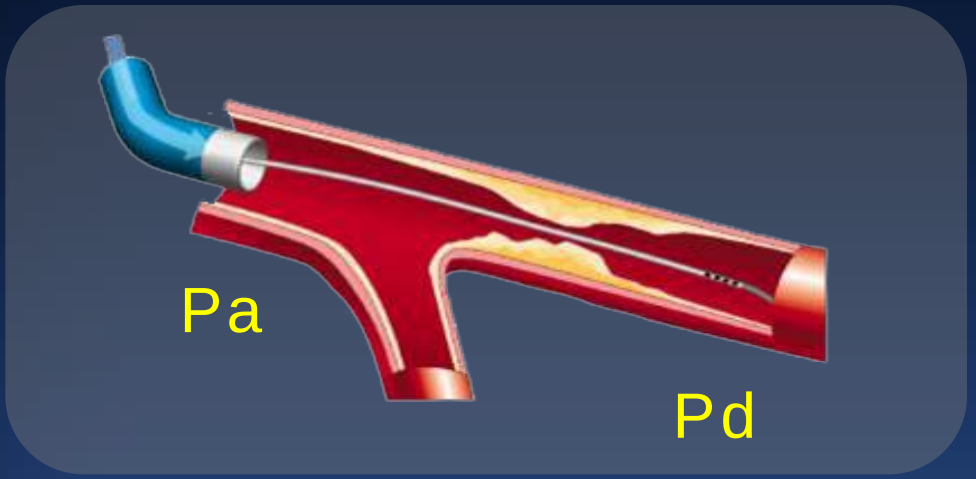
Issues Briefs

FFR & IVUS: How Can We Implement?

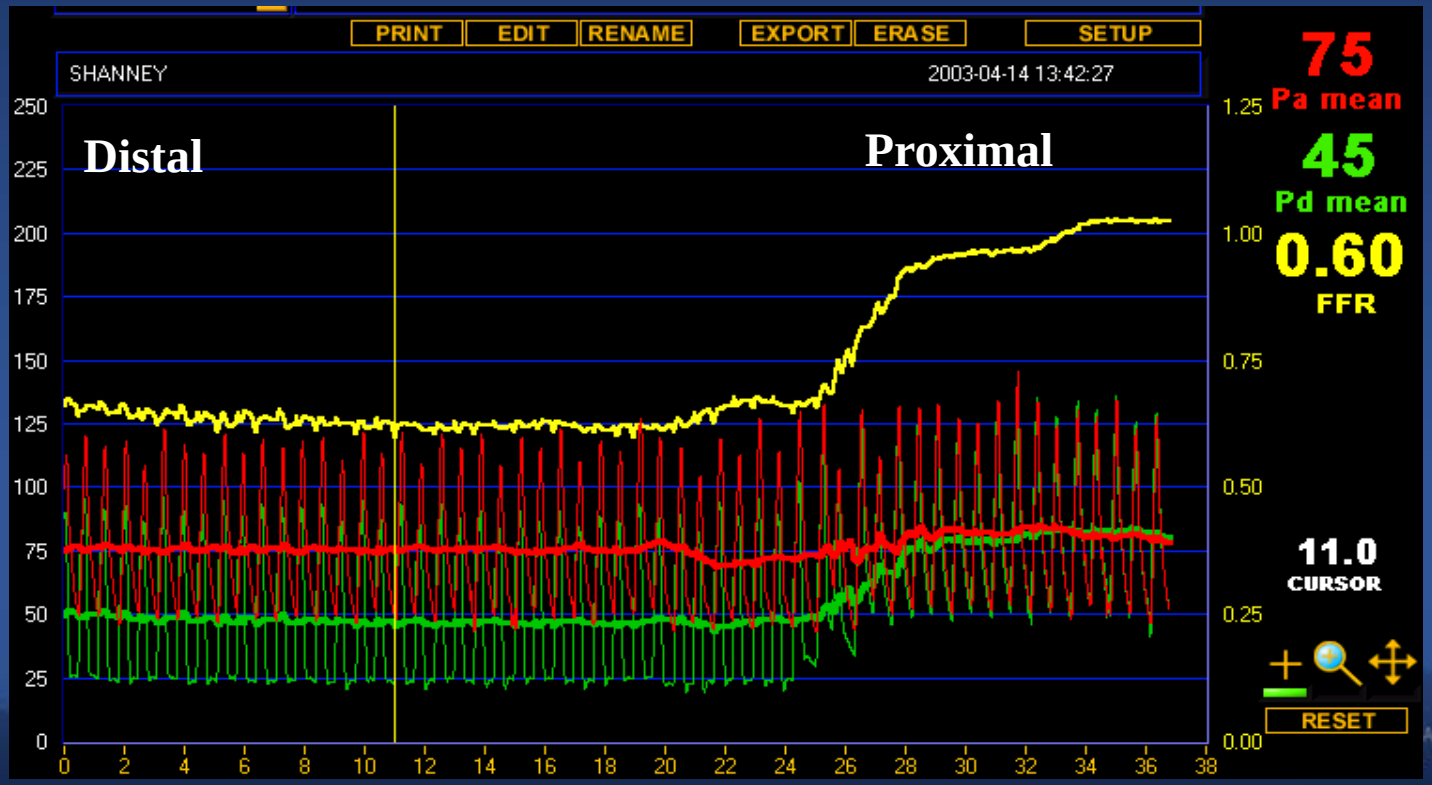
- Physiologic vs. Anatomic assessment of lesion severity
- Can IVUS-MLA replace FFR?
- Integrated use of IVUS and FFR in real practice

Fractional Flow Reserve (FFR)

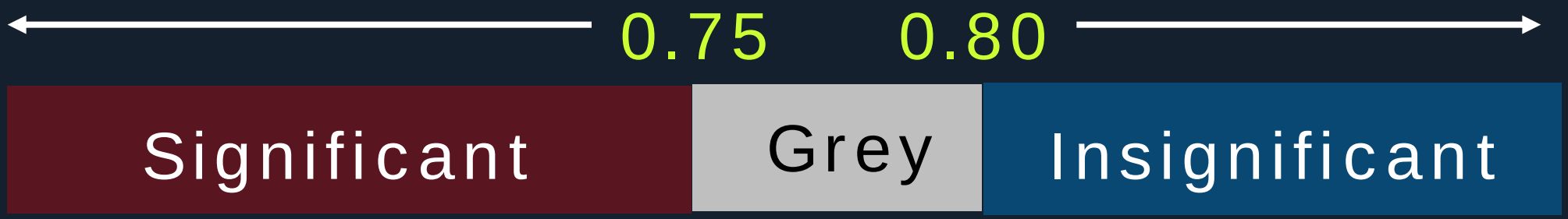


At Maximal Hyperemia

$$\frac{Q_S{}^{max}}{Q_N{}^{max}} = \frac{Pd}{Pa}$$



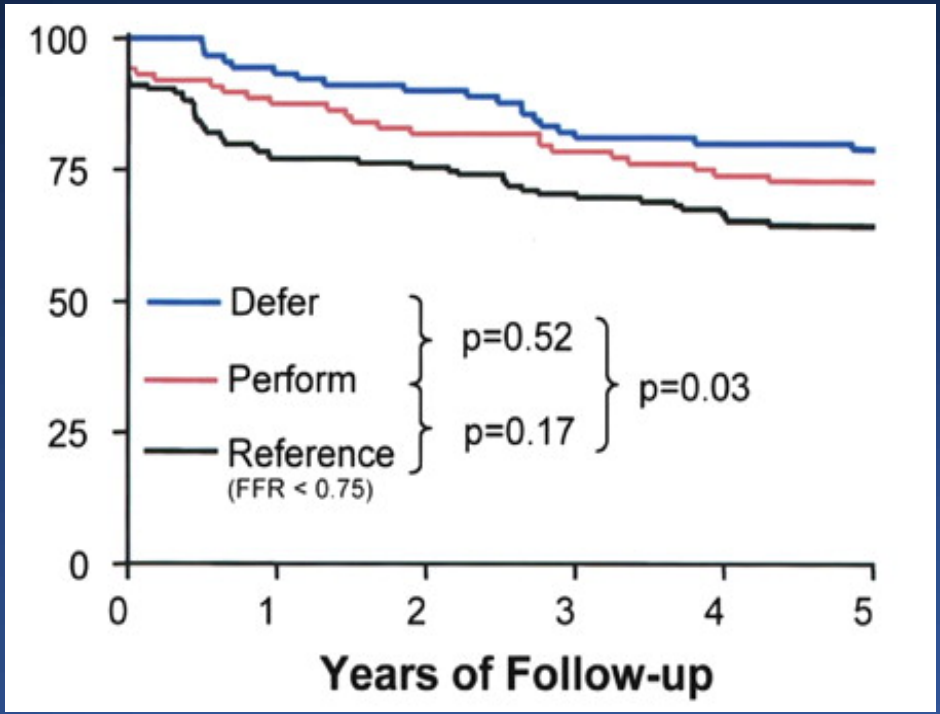
Cut-Offs to Predict Ischemia



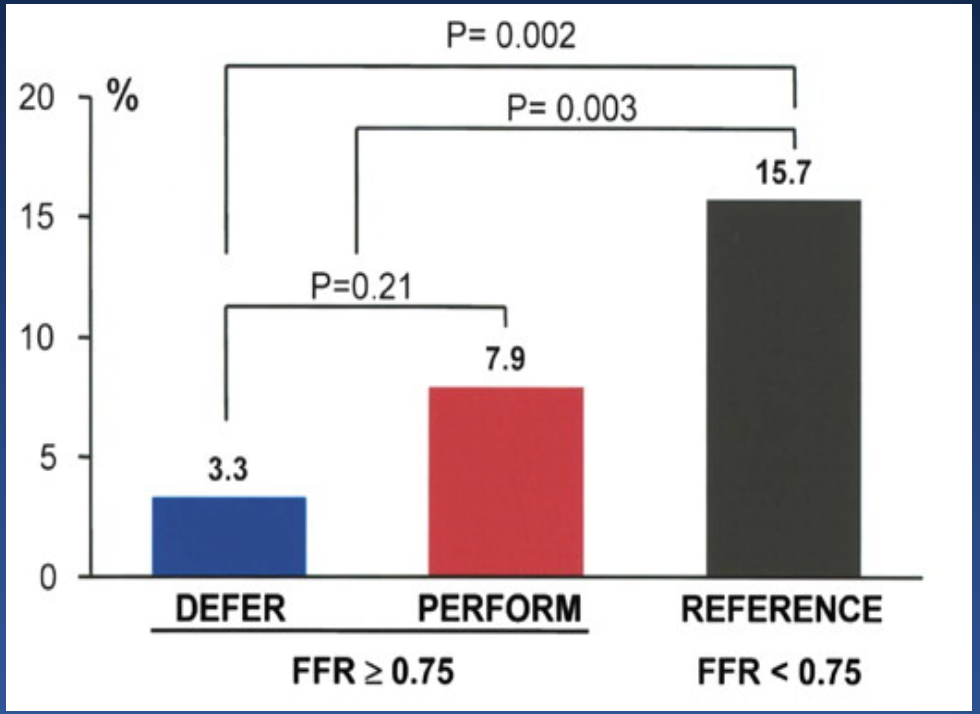
Author	Number	Stress Test	BCV	Accuracy
Pijls et al.	60	X-ECG	0.74	97
DeBruyne et al.	60	X-ECG/SPECT	0.72	85
Pijls et al.	45	X-ECG/SPECT/pacing/DSE	0.75	93
Bartunek et al.	37	DSE	0.68	90
Abe et al.	46	SPECT	0.75	91
Chamuleau et al.	127	SPECT	0.74	77
Caymaz et al.	40	SPECT	0.76	95
Jimenez-Navarro et al.	21	DSE	0.75	90
Usui et al.	167	SPECT	0.75	79
Yanagisawa et al.	167	SPECT	0.75	76
Meuwissen et al.	151	SPECT	0.74	85
DeBruyne et al.	57	MIBI-SPECT post-MI	0.78	85
Samady et al.	48	MIBI-SPECT post-MI	0.78	85
Kang SJ (AMC 2010)	151	SPECT	0.77	89

DEFER 5 Year Results

Event Free Survival

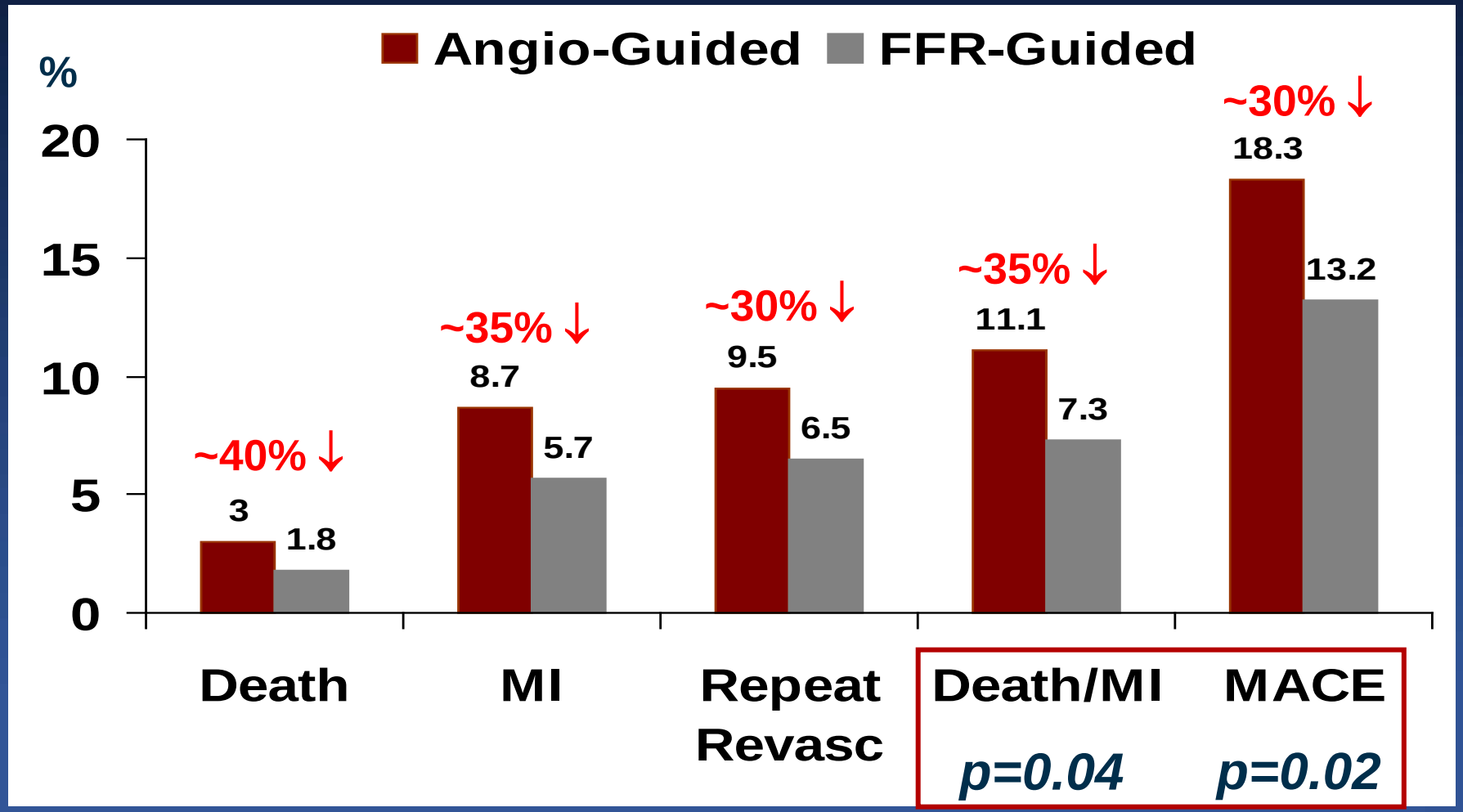


Cardiac Death and MI



Pijls et al. J am Coll Cardiol 2007;49:2105-11

FAME: One Year Outcomes

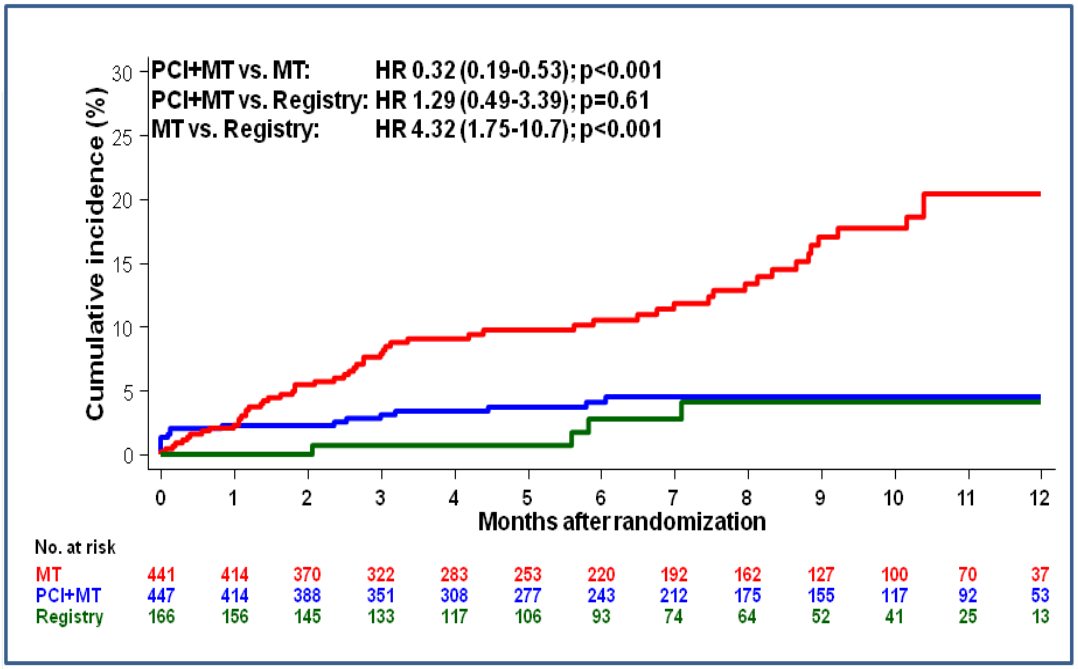


Tonino et al. New Engl J Med 2009;360:213-24

FAME 2

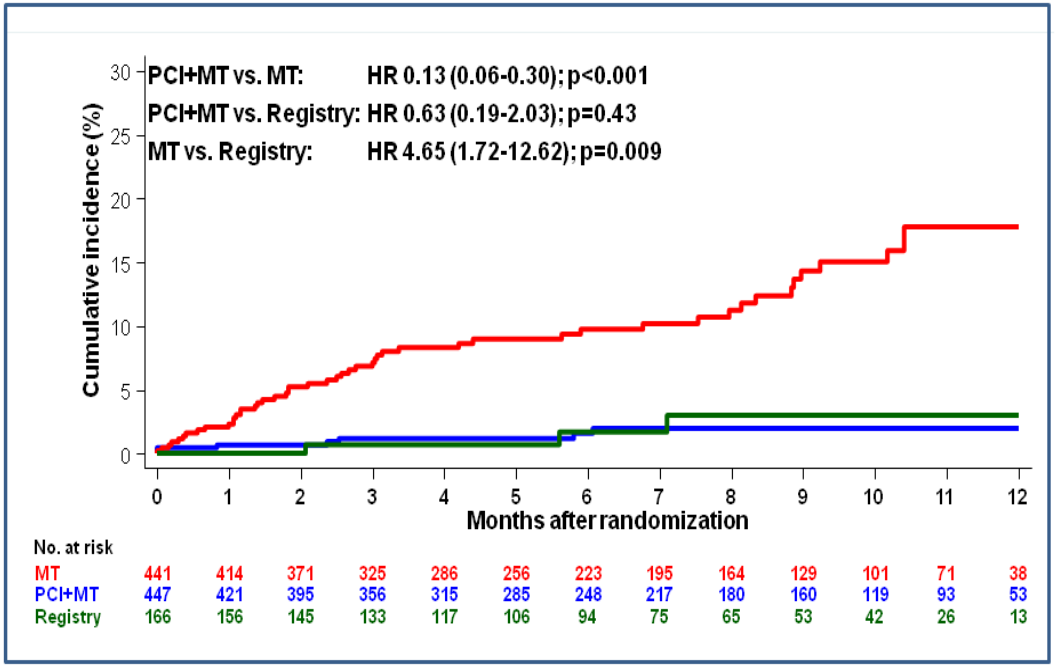
FFR-Guided PCI vs. Medical Therapy in Stable CAD

Primary Outcomes

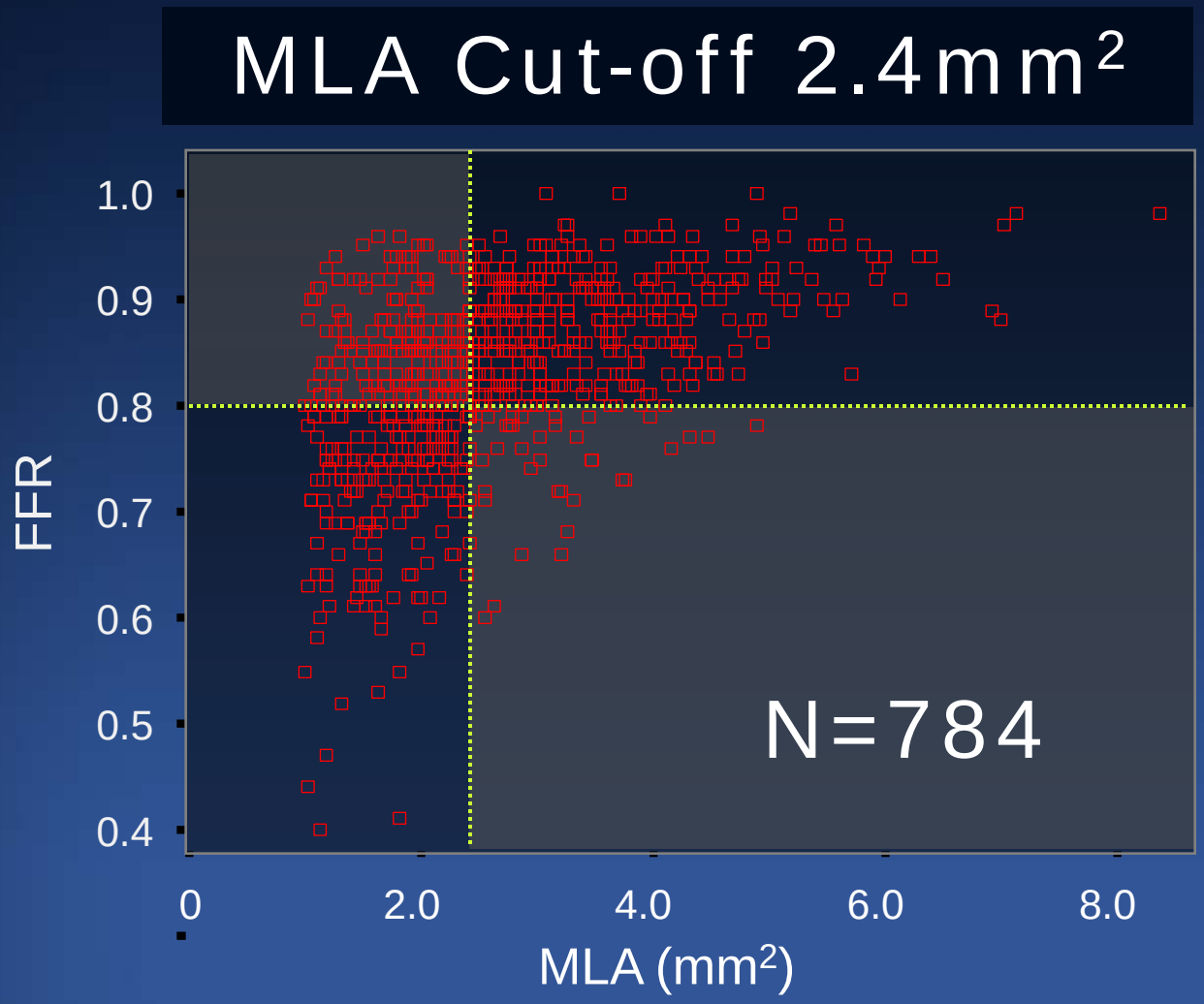


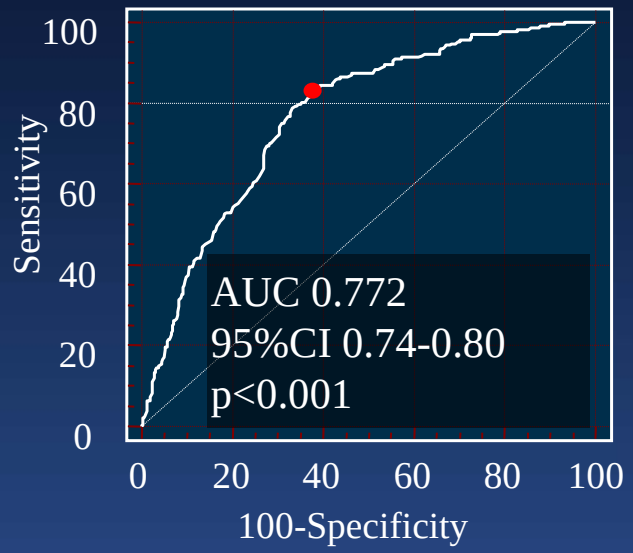
* Composite of all cause death, myocardial infarction, unplanned hospitalization with urgent revascularization

Urgent Revascularization



Validation of IVUS-MLA with FFR





Sens. 84%
Spec. 63%
PPV 48%
NPV 90%
Accuracy 69%

Kang et al. Am J Cardiol 2012;109:947-53

	N	FFR	RLA	MLA	AUC	Sens	Spec	PPV	NPV	Accuracy
Takaki (1999 Circ)	51	0.75	9.3	3.0	–	83%	92%	–	–	–
Briguori (2001 AJC)	53	0.75	7.8	4.0	–	92%	56%	38%	96%	64%
Ben-Dor (2012 *)	205	0.80	8.6	3.09	0.73	69%	72%	–	–	70%
Kang (2011 Circ int)	236	0.80	7.6	2.4	0.80	90%	60%	37%	96%	68%
Kang (2012 AJC)	784	0.80	8.2	2.4	0.77	84%	63%	48%	90%	69%
Koo (2011 JACC int)	267	0.80	6.8	2.75	0.81	69%	65%	27%	81%	67%
Gonzalo (2012 JACC)	47	0.80	7.1	2.36 IVUS	0.63	67%	65%	67%	65%	66%
Gonzalo (2012 JACC)	61	0.80	7.1	1.95 OCT	0.70	82%	63%	66%	80%	72%

Why Mismatch Between MLA-FFR?

	Beta	p-value	Adjusted OR	95% CI
MLA<2.4 *but* FFR≥0.8 *"Mismatch"*				
Female gender	0.371	0.048	1.450	1.003 – 2.095
LAD location	-0.406	0.027	0.666	0.465 – 0.954
Reference lumen ø	-1.209	<0.001	0.298	0.204 – 0.437
Distal segment	0.704	0.002	2.021	1.293 – 3.159
MLA≥2.4 *but* FFR<0.8 *"Rev-mismatch"*				
Age	-0.062	<0.001	0.940	0.909 – 0.972
LAD location	0.813	0.071	2.256	0.932 – 5.460
Plaque rupture	2.410	<0.001	11.138	4.886 – 25.39

Park et al. JACC Cardiovasc Interv 2012;5:1029-36

Discussion

- **FFR & IVUS: How Can We Implement?**
  - **Is physiologic assessment essential?**
  - **Is morphologic assessment enough?**
  - **Can IVUS-MLA replace FFR in LMCA and non-LMCA?**
  - **Integrated use of FFR and IVUS in real practice**