

MULTIPLE VESSEL PCI IN STEMI PATIENTS:

Culprit Only PCI, Safety First, Choose Wisely Until Definitive Trials



STEMI Pts have multiple complex plaques that are associated with adverse clinical outcomes and plaque instability is a generalized process

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Multiple Vessel PCI in STEMI Pts:

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Interventional approaches to STEMI pts with MVD

- **Culprit only IRA PCI at index procedure**
- **Complete revascularization strategy**
 - **PCI to all lesions > 50% at index procedure (PRAMI and CvLPRIT Trials)**
 - **Staged PCI to all lesions > 50% at index hospitalization**
 - **Staged PCI at follow up if clinically indicated by recurring symptoms or abnormal MPI**

Multiple Vessel Percutaneous Intervention in the Acute Myocardial Infarction Patient

MAHI Experience – 1999-2005

1101 consecutive pts: 841 BMS; 260 DES

Single Vessel Disease
PCI of IRA, N = 404 (36.7%)

(Group 1)

Multivessel Disease
N = 697 (63.3%)

PCI of IRA only
N = 465 (66.7%)

(Group 2)

**PCI of IRA + non IRA
at same procedure**
N = 37 (5.3%)

(Group 3)

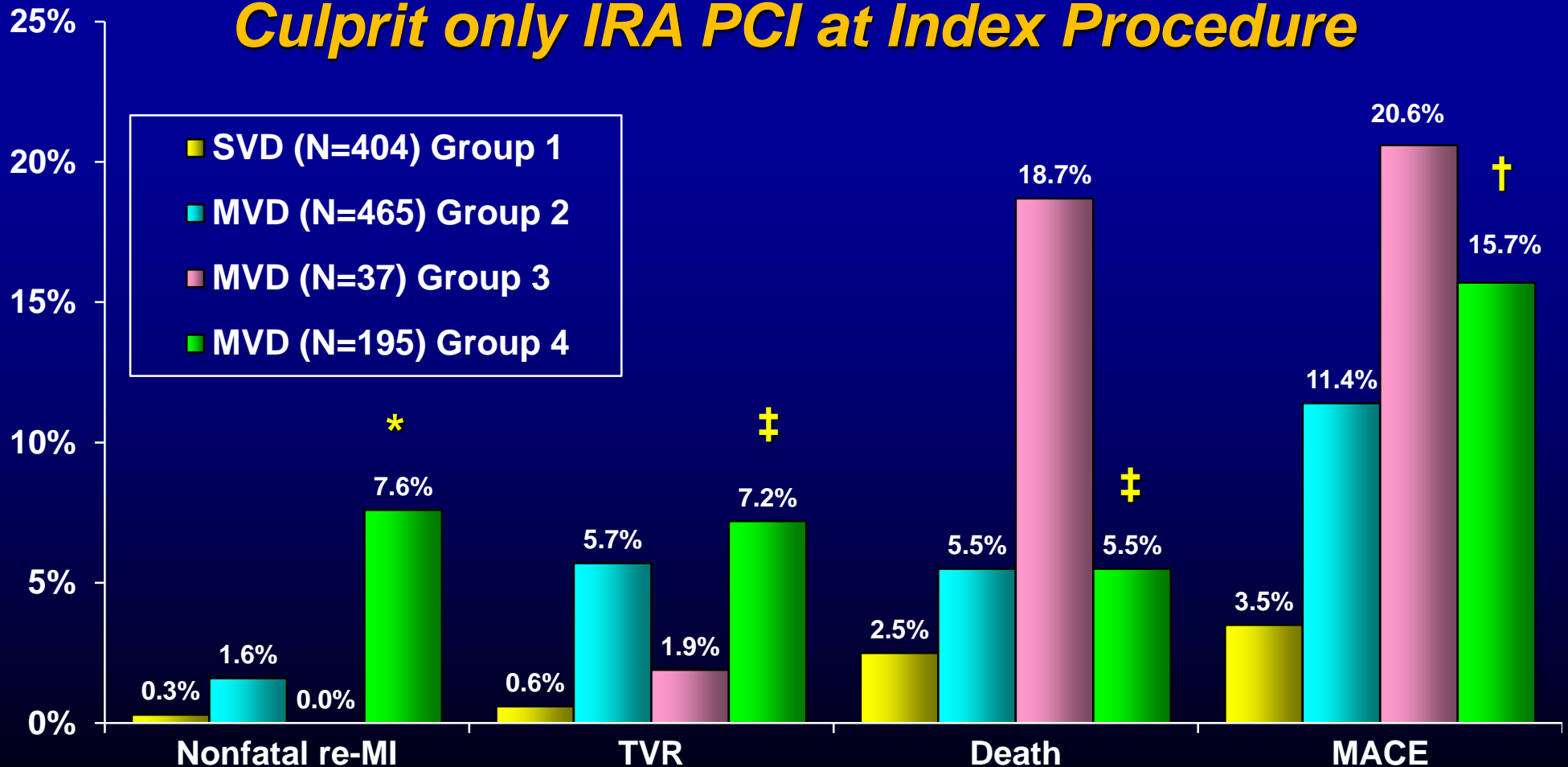
**PCI of IRA + non IRA
Staged w/in 30 days**
N = 195 (30.0%)

(Group 4)

Multiple Vessel Percutaneous Intervention in the Acute Myocardial Infarction Patient

1101 Consecutive Pts: 841 BMS; 260 DES

Culprit only IRA PCI at Index Procedure



* p<0.001 group4 vs group2

† p=0.02 group4 vs group2

‡ p=NS group4 vs group2

Prevalence, Predictors and In-Hospital Outcomes of Non-IRA Intervention During 1^o PCI for STEMI: NCDR™

- 708,481 admissions, 638 sites, 2004-07
- 31,361 pts with MVD, 2745 pts (8.7%) staged PCI (excluded)
- 28,936 pts, 3,134 (10.8%) had MV PCI at index procedure

	Single Vessel PCI N = 25,802	MV PCI N = 3,134	p-value
In-hospital mortality (%)	5.12	7.85	<0.01
Death in lab (%)	0.36	1.24	<0.01
Bleeding complications (%)	5.30	6.71	<0.01
Renal failure (%)	1.81	2.31	0.09
Pts w/ Cardiogenic Shock			
In-hospital mortality (%)	27.77	36.49	<0.01
Death in lab (%)	2.64	5.77	0.25
Bleeding complications (%)	12.48	13.81	0.44
Renal failure (%)	7.41	9.72	0.03

- **Conclusion:** Avoid MV PCI during index procedure

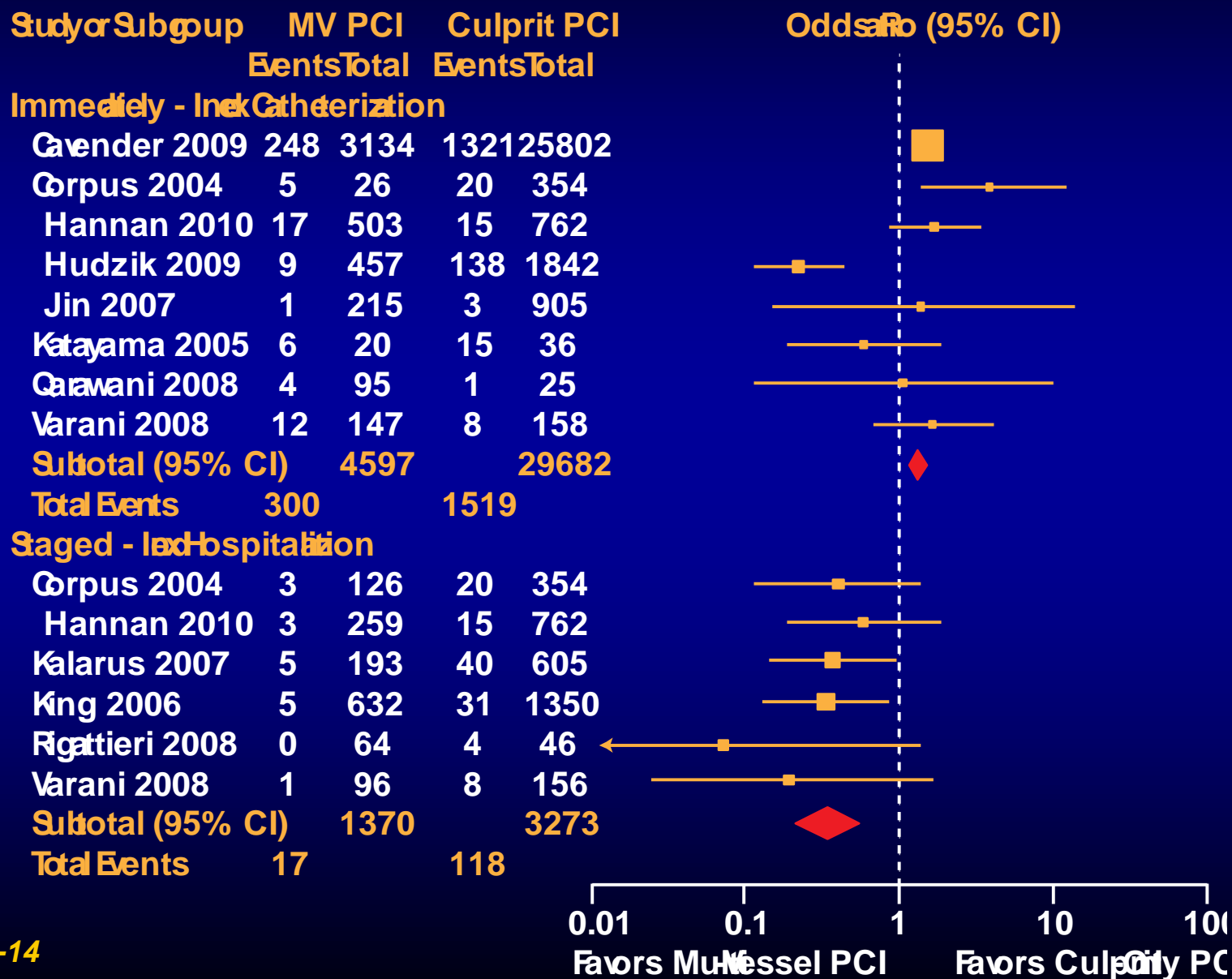
Complete vs. Culprit-only Revascularization for Pts with MVD Undergoing Primary PCI for STEMI: *A Systematic Review and Meta-analysis*

- **26 studies (3 randomized), mean F/U 14.5 mths
46,324 pts, 7,886 MV PCI;**
- **38,438 culprit only PCI**
- **MV PCI at index procedure in 16 studies**
- **MV PCI at staged index hosp in 9 studies**
- **MV PCI electively in 9 studies**

Complete vs. Culprit-only Revasc for Pts with MVD in 1^o PCI for STEMI: A Systematic Review and Meta-analysis

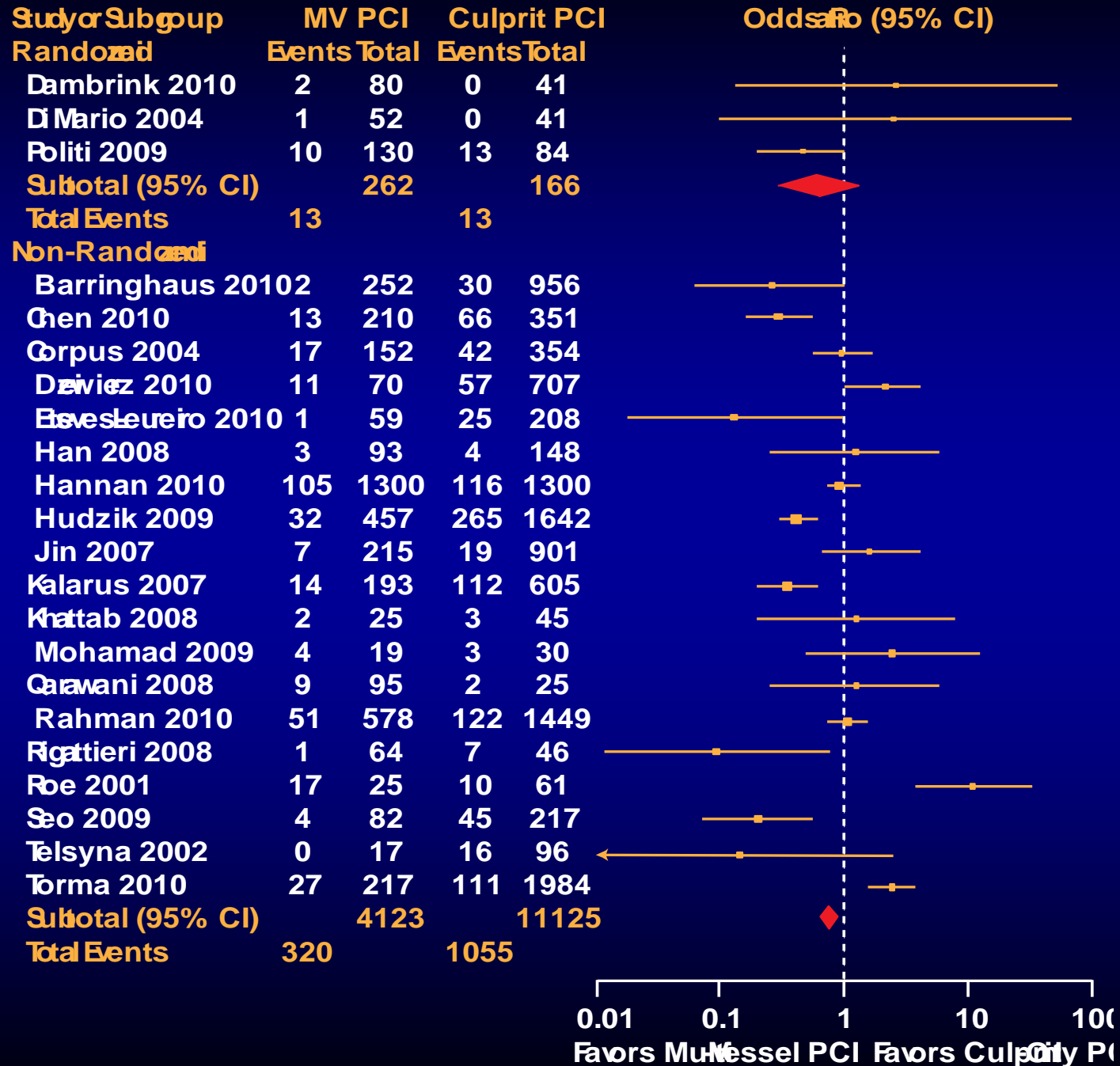
IN-HOSPITAL MORTALITY BY TIMING OF MV PCI

Conclusion:
Increased hospital mortality in those with MV PCI at index procedure



LONG-TERM MORTALITY BY STUDY METHOD

Complete vs. Culprit-only Revasc for Pts with MVD in 1^o PCI for STEMI: A Systematic Review & Meta-analysis

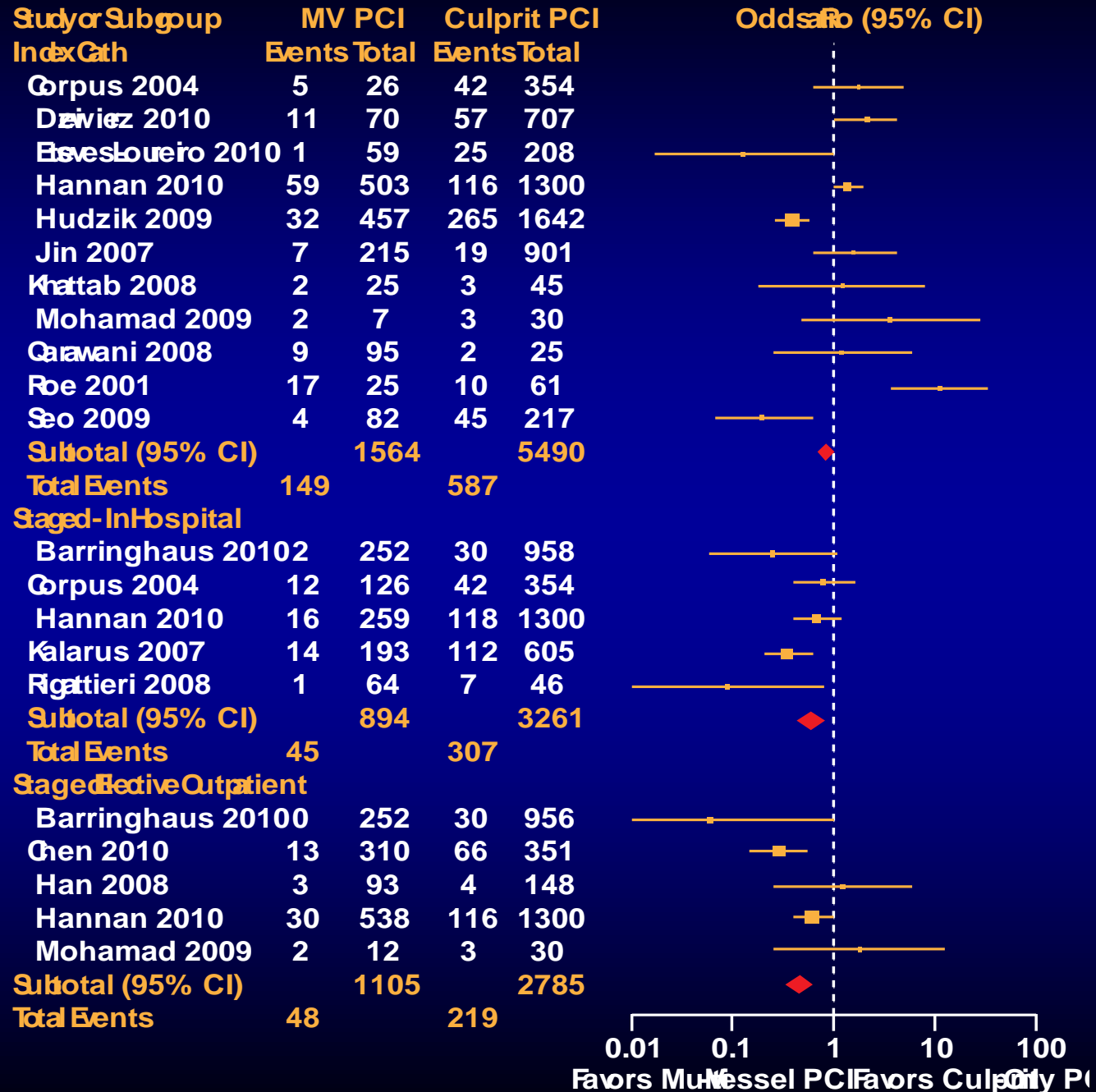


Conclusion:
Survival benefit with MV PCI vs. Culprit-only PCI

Complete vs. Culprit-only Revasc for Pts with MVD in 1° PCI for STEMI: A Systematic Review & Meta-analysis

Conclusion:
Trend to improved survival with MV PCI in hospital or after initial hospitalization

LONG-TERM MORTALITY BY TIMING OF MV PCI



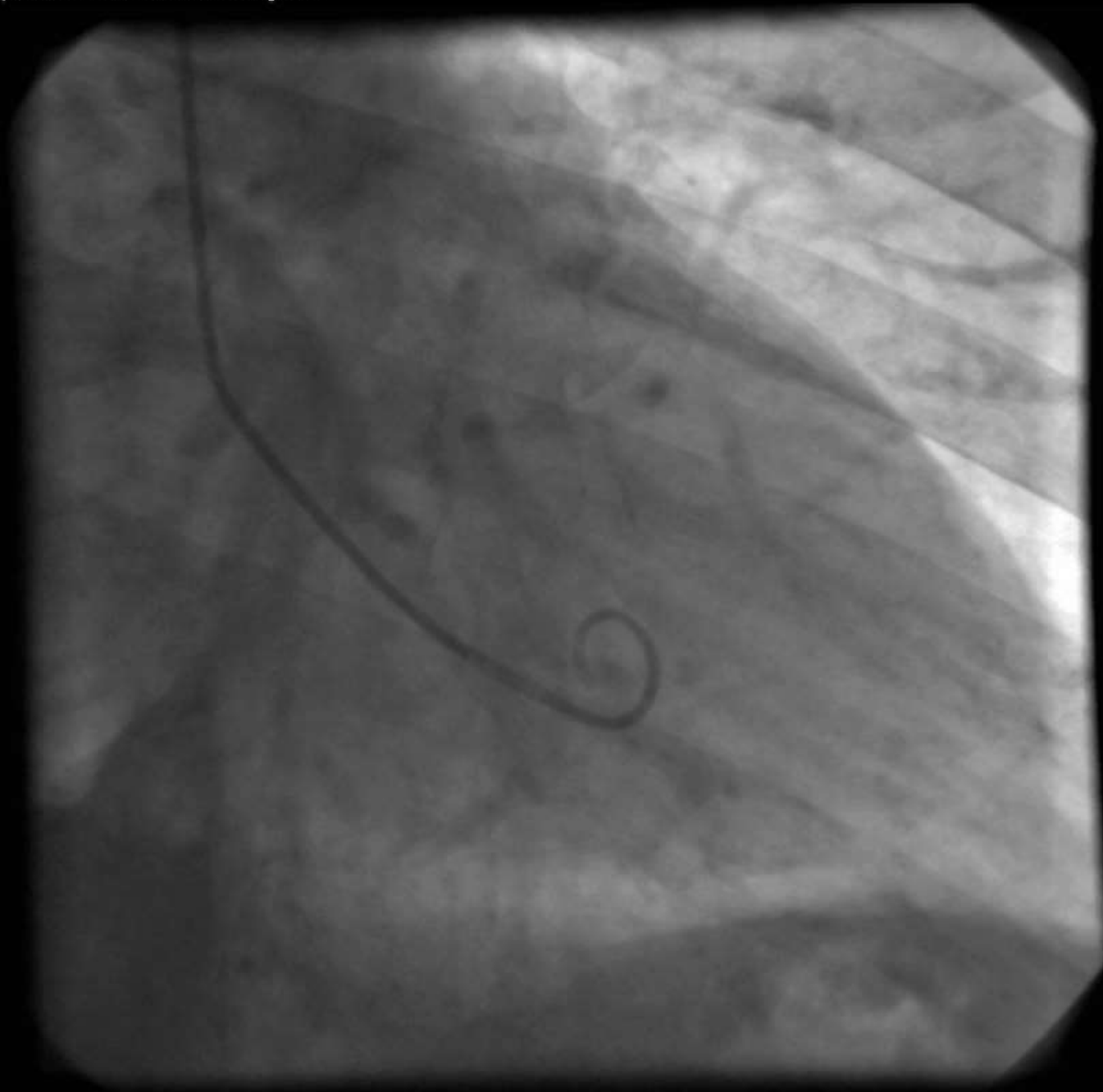
MV PCI in STEMI Pts at Index Procedure

“Traps for Young Players”

- **Must attain a “perfect result” in the IRA**
- **Multiple unstable plaques in N-IRA**
- **Any complication of N-IRA PCI is magnified 100% resulting in major compromise to LV function**
- **Complex anatomy demands time and patience – N-IRA-bifurcation, CTO, long diffuse disease, heavy calcification, LMCA lesions**
- **Increased radiation, contrast volume, procedure time – all associated with increased complications**
- **Operator fatigue – STEMI in overnight hours**
- **No effective evaluation of the N-IRA: IVUS, Virtual Histology, OCT, FFR, iFR**



Recipes for Disaster



**59-yo
Male**

**Acute
Antero-
Septal
Infarct**

(AM)

Randomized Trial of Preventive Angioplasty in MI: PRAMI Trial

- 5 centers in UK, 2008-2013. 465 pts with STEMI randomized to preventive PCI (234 pts) or no preventive PCI (231 pts)
- **Primary Outcome:** Composite cardiac death, nonfatal MI, refractory angina (23 months)

	Preventive PCI	No Preventive PCI	p-value
Primary Outcome (D, AMI, RA)	21 (9/100)	53 (23/100)	<0.001
Cardiac death/AMI	11	27	0.004
Cardiac Death	4	10	0.07
Nonfatal AMI	7	20	0.009
Refractory Angina	12	30	0.002
Secondary Outcome			
Death from noncardiac cause	8	6	0.86
Repeat revascularization	16	46	<0.001

- **Conclusion:** In pts with STEMI and MVD, preventive PCI results in significant reduction in adverse cardiovascular events

Randomized Trial of Preventive Angioplasty in MI: PRAMI Trial Critique

- 2428 pts screened, 1922 not eligible
- 465 pts randomized (19%), 1122 SVD
- 465 pts (20 pts/year/center), ~2 pts per month
- Stenoses > 50% by angio, no FFR, IVUS, OCT or VH
- Procedure time, fluoro time and contrast volume increased
- **Ineligible pts:** unable to consent, previous CABG, 50% of LMCA or ostial LAD and LCX, cardiogenic shock, CTO
- **No difference:** stroke, bleeding, nephropathy

Randomized Trial of Preventive Angioplasty in MI: PRAMI Trial

Conclusion Should Be:

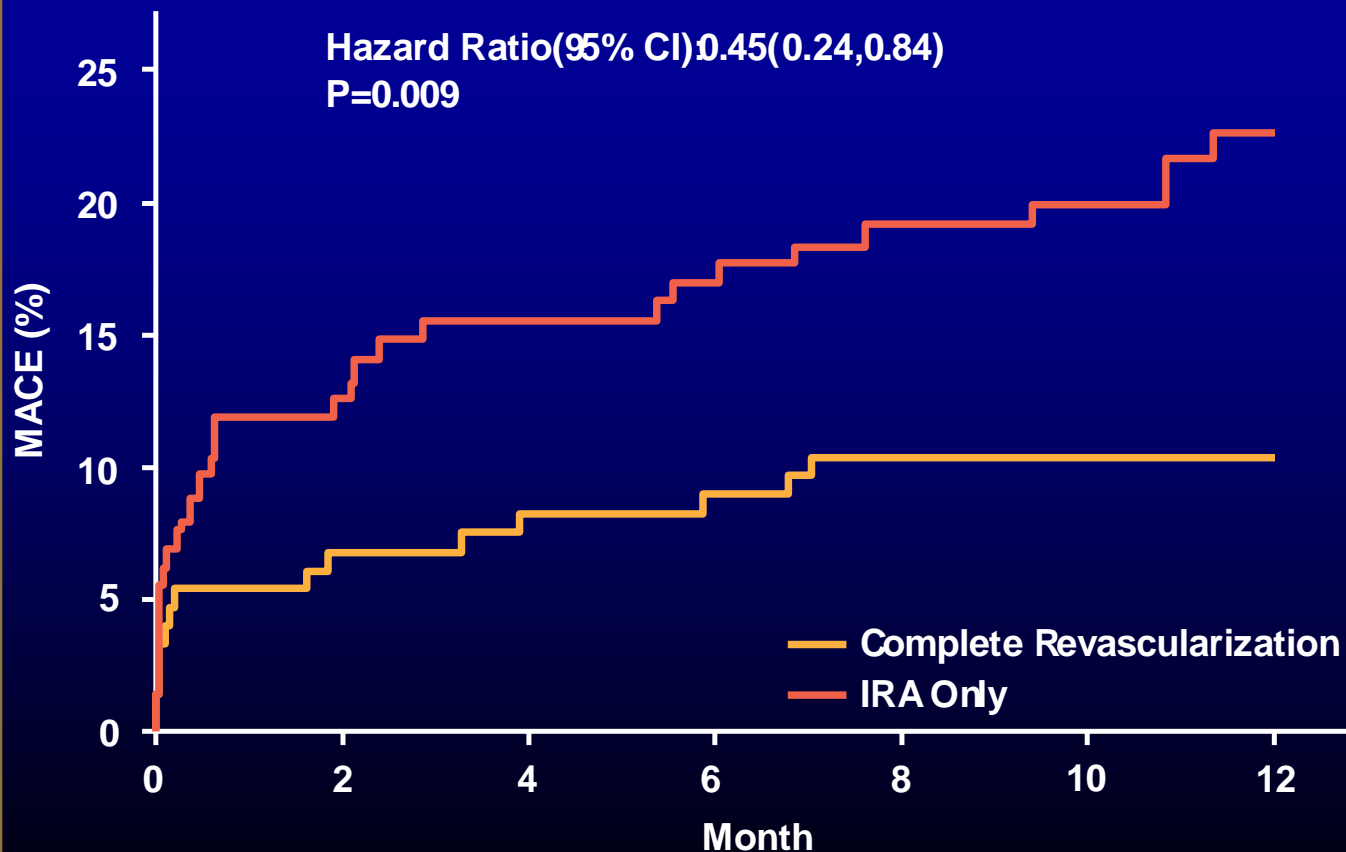
**“In a very highly selected group of pts with
STEMI and MVD, preventive PCI may
reduce adverse cardiovascular events”**

Randomized Trial of Complete vs. Lesion-only Revasc in Pts Undergoing 1^o PCI for STEMI & MVD (CvLPRIT Trial)

- 296 pts in 7 UK centers were randomized to either in-hospital complete revasc (N=150) or IRA-only revasc (N=146)
- **Primary Endpoint:** Composite all-cause death, MI, HF, revasc at 12 months
- Patients were randomized after angiogram and before PCI; attempt to revasc at index procedure but operator-dependent (64% of the complete revasc group, received non-IRA PCI at index procedure)

Randomized Trial of Complete vs. Lesion-only Revasc in Pts Undergoing 1° PCI for STEMI & MVD (CvLPRIT Trial)

Cumulative Event Rate



Conclusion:
In-hospital complete revasc of significant N-IRA lesions results in improved clinical outcomes vs treatment of culprit lesion only; however, no significant difference in death or MI

Multiple Vessel PCI in STEMI Pts:

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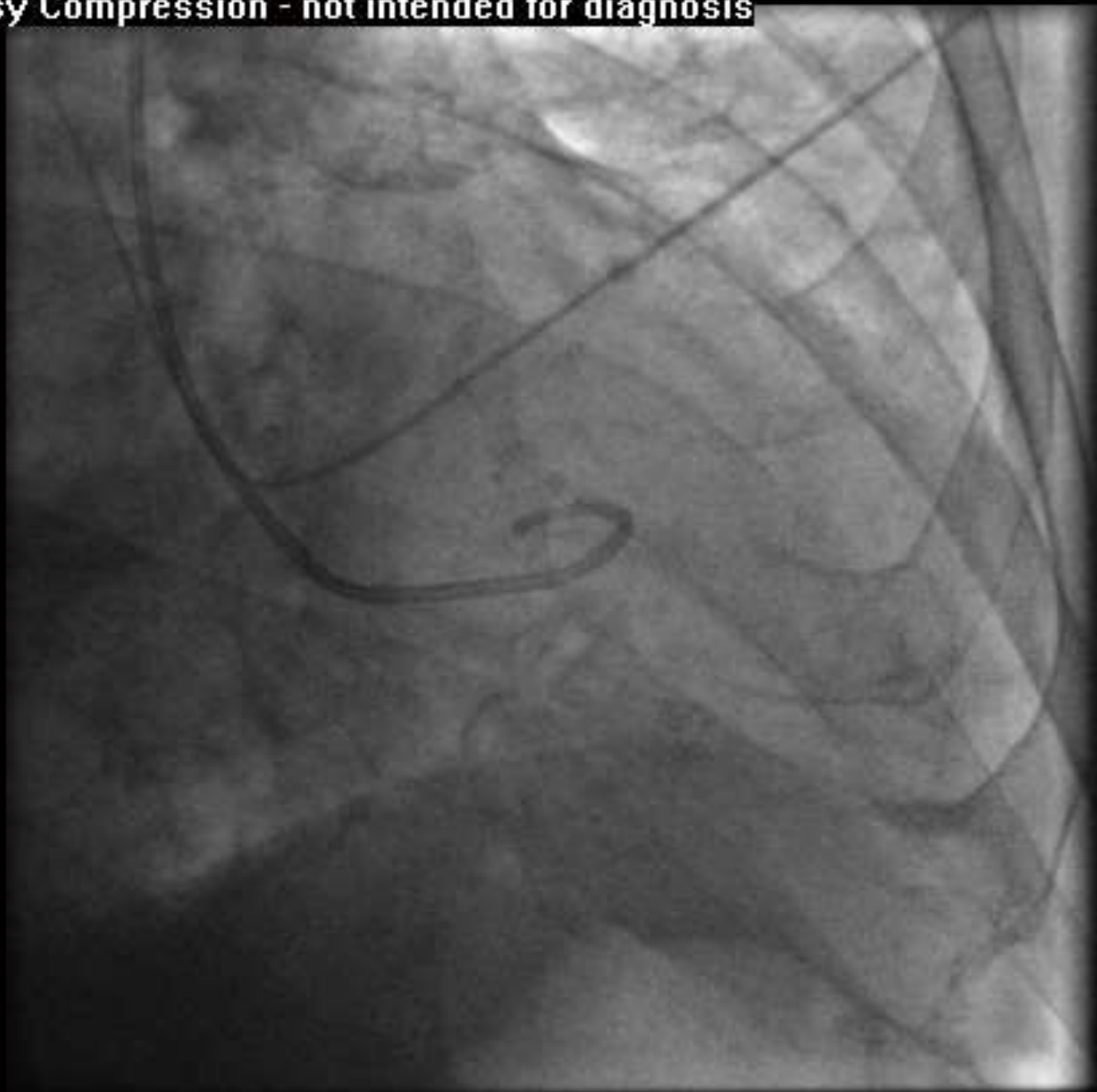
Advantages of Staged PCI of the N-IRA in STEMI Pts

- Recovery of LV function
 - Reassess the result in the IRA – residual thrombus, residual lesion
 - Reassess the N-IRA – lesions and diameter
 - Application of FFR, iFR, IVUS and Virtual Histology
 - Application of PROSPECT Trial data to final decision to stent
 - Plaque burden $\geq 70\%$
 - VH-TCFA
 - MLA $\leq 4.0 \text{ mm}^2$
- } Predicts MACE of 18-20% at 3 yrs

Lossy Compression - not intended for diagnosis

**82-year-
old
Male**

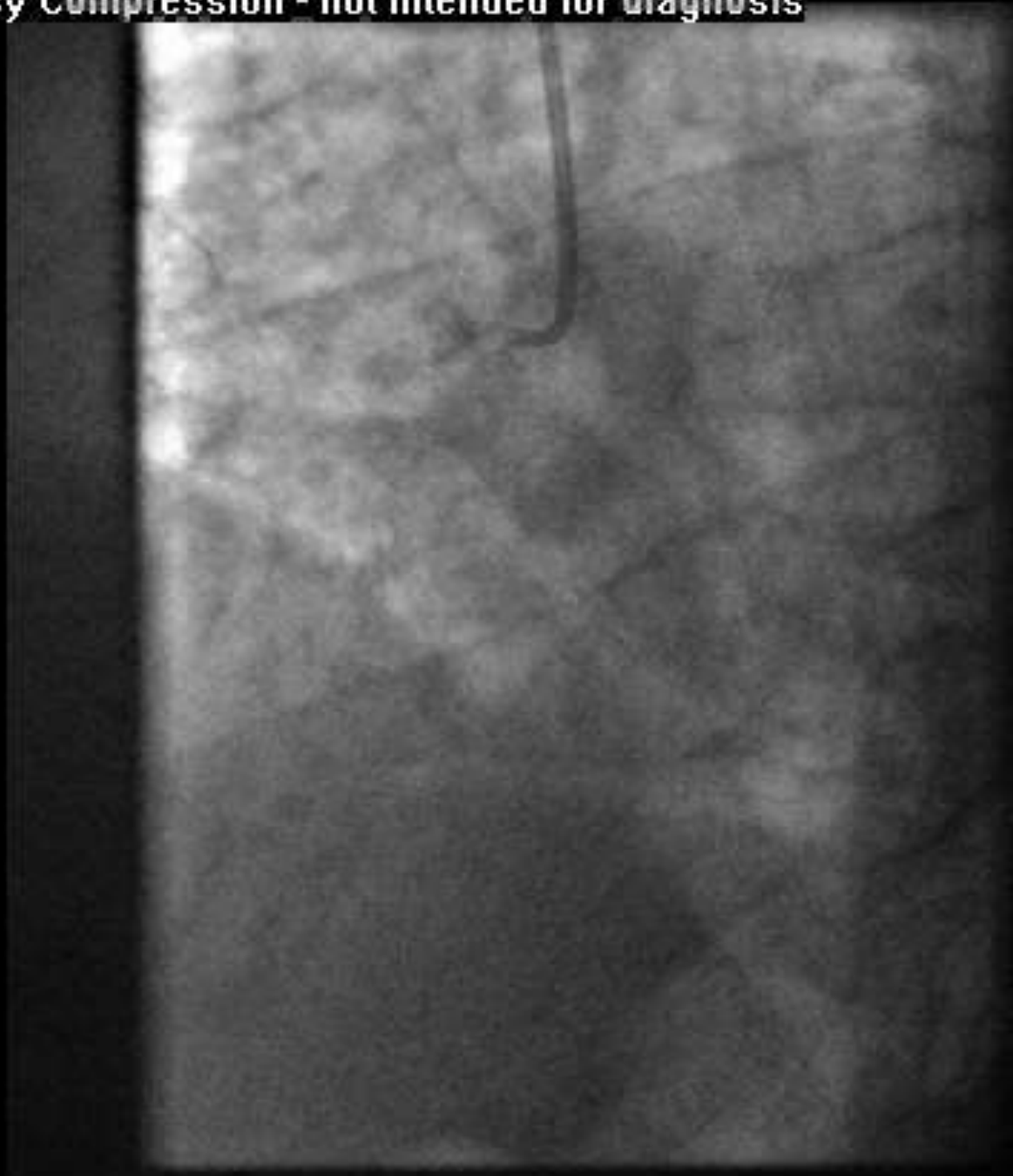
**Acute
Inferior
MI
3/12/08**



Lossy Compression - not intended for diagnosis

**82-year-
old
Male**

**Acute
Inferior
MI
3/14/08**



Multiple Vessel PCI in STEMI Patients

Final Recommendation

- Culprit only IRA PCI at index procedure
- Staged PCI to N-IRA lesions following careful reassessment at index hospitalization
- Results of 4000-pt COMPLETE Trial are pending; culprit only PCI vs. compete revascularization at staged PCI within 72 hours