

Benefits of CTO PCI

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Disclosures

- Advisory Board: Abbott Vascular, Medtronic
- Speakers Bureau: Astra-Zeneca, Abbott Vascular
- CTO Interventionalist: YES



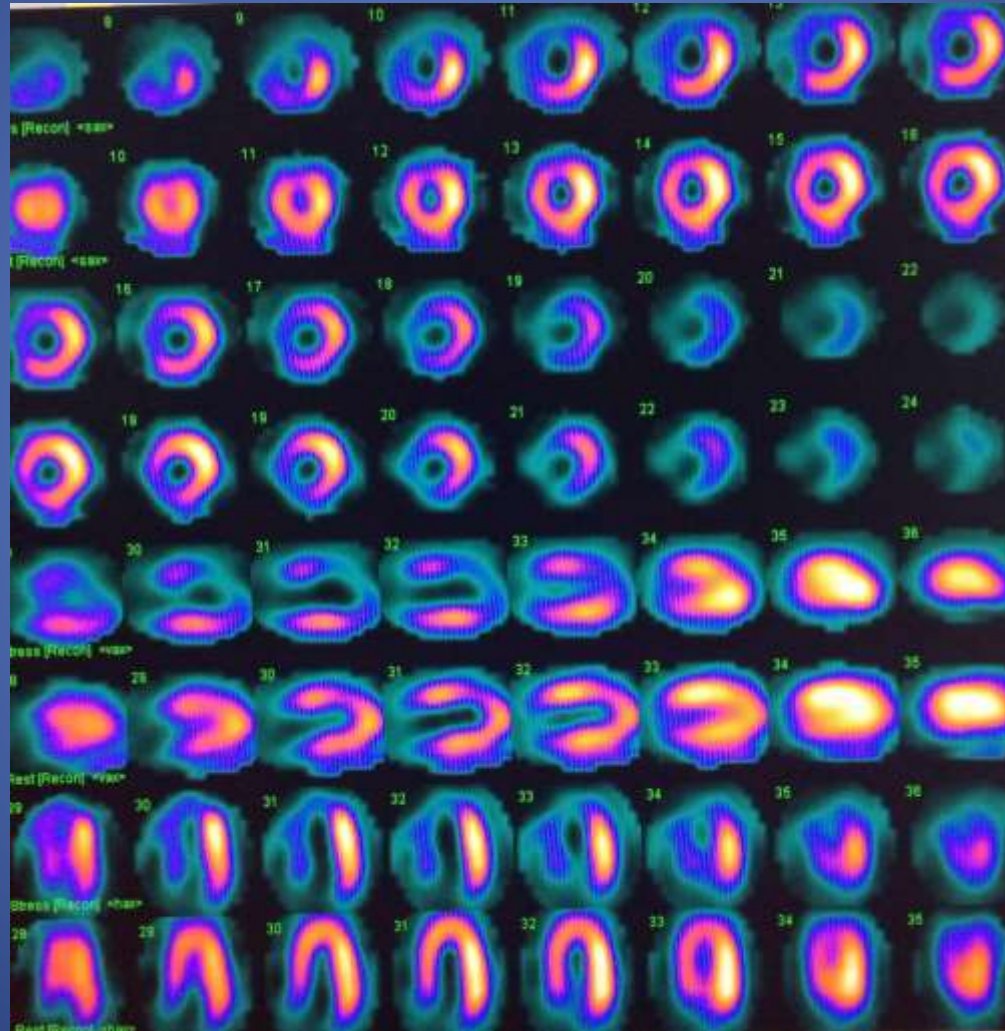
Chronic Total Occlusions

Common Approach

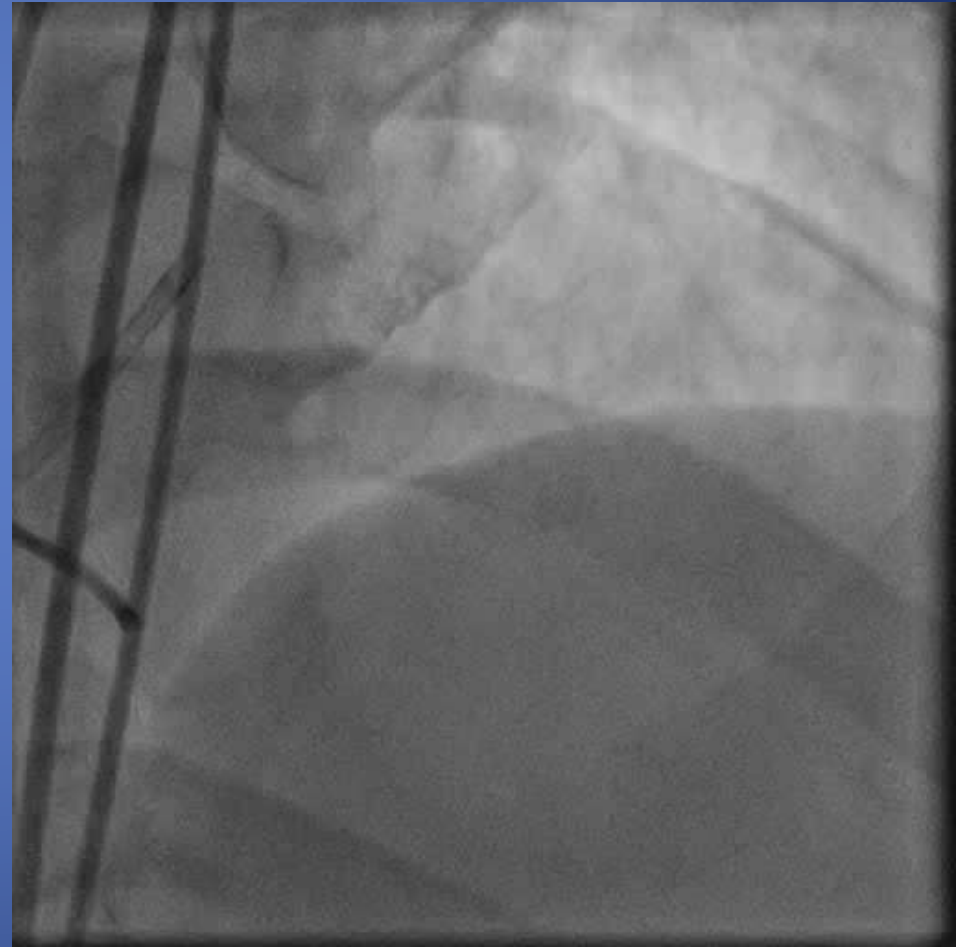
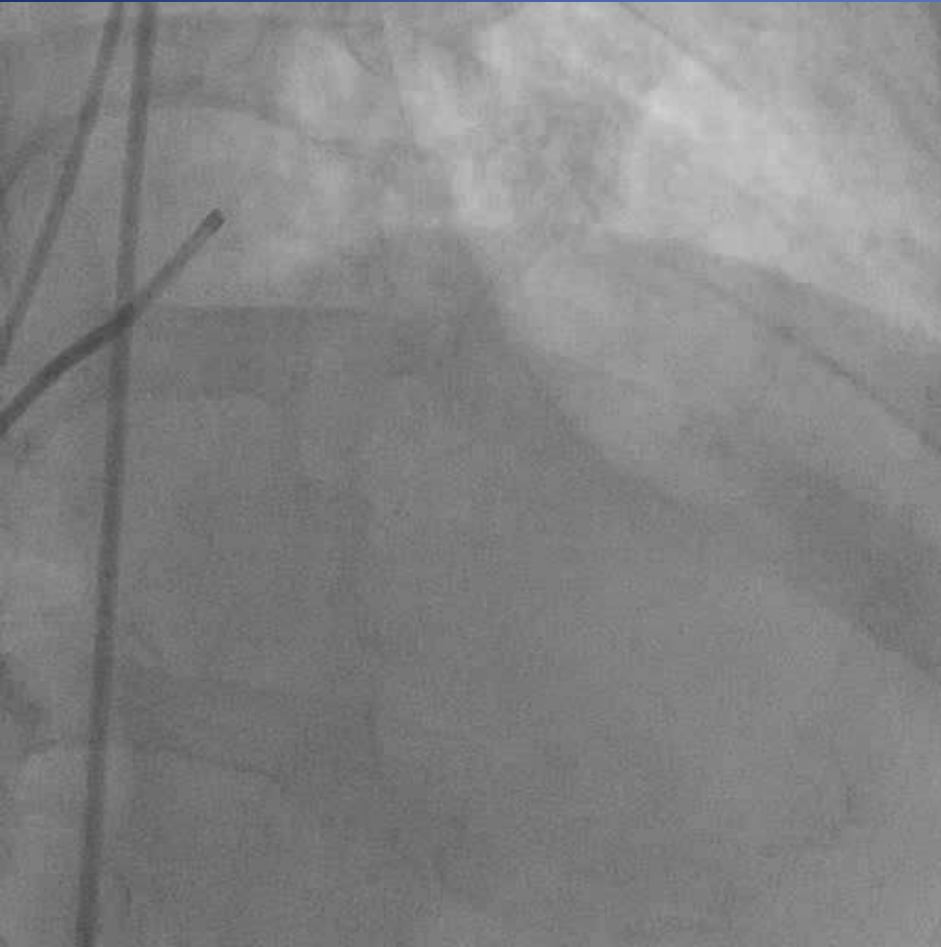


“The total blockage has been there for a long time and has good collateral blood flow. It can not be the cause of your symptoms.”

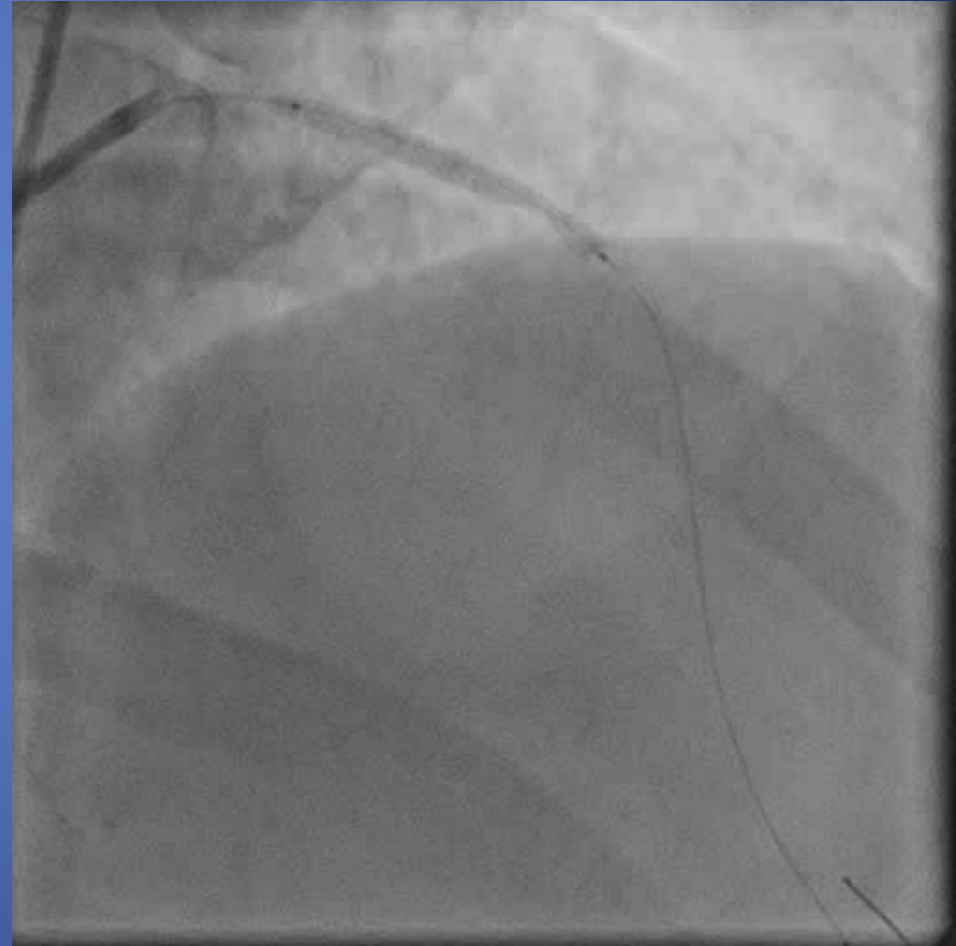
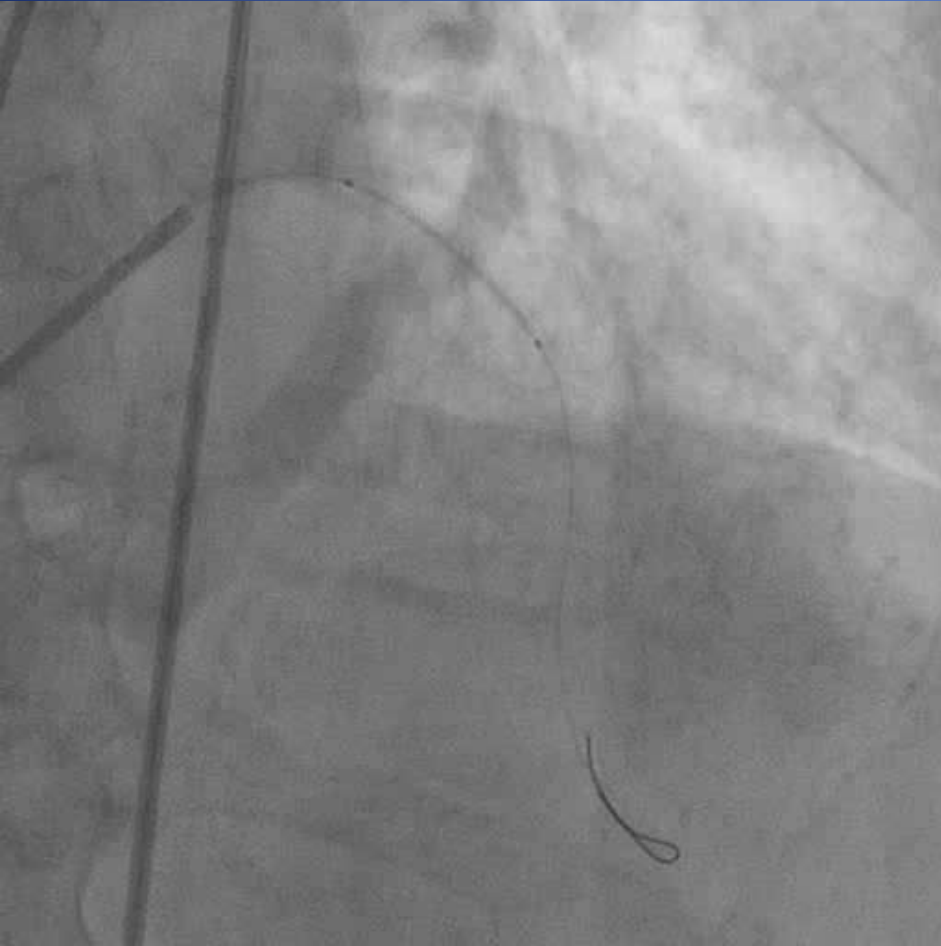
Carman: 68 y/o with CCS 2 DOE/CP



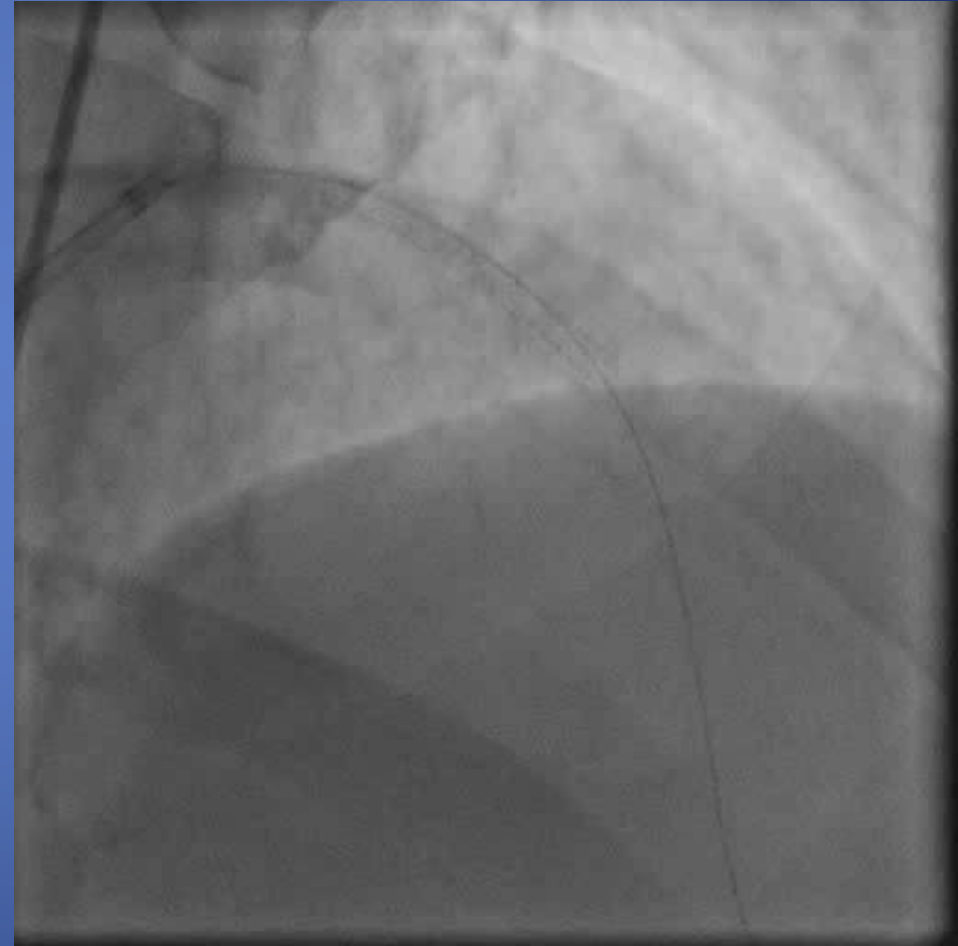
High grade proximal LAD lesion



DES PCI



Final Result



Why the Bias?

- CTO PCI cases are:
 - More complex and challenging
 - Time consuming
 - More Risky
 - Hippocratic Oath
 - “First do no harm”
 - » 19th-century surgeon Thomas Inman
 - **No Real Benefit?**



Goals for any physician/therapy

- Mortality Benefit
 - Help patients live longer
- Quality of Life
 - Help patients feel better



Mortality Benefit

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CLINICAL RESEARCH

Successful Recanalization of Chronic Total Occlusions Is Associated With Improved Long-Term Survival

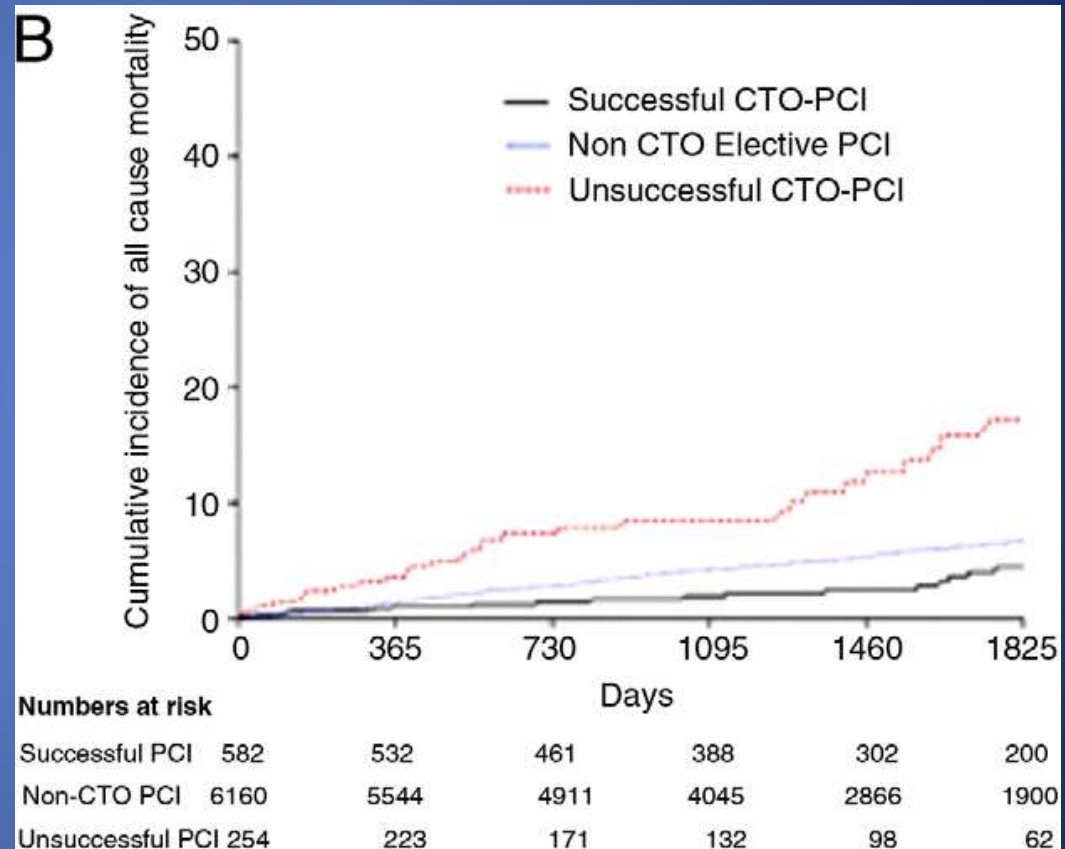
Daniel A. Jones, MD,*†‡ Roshan Weerackody, MD,* Krishnaraj Rathod, MD,*
Jonathan Behar, MD,* Sean Gallagher, MD,* Charles J. Knight, MD,*‡ Akhil Kapur, MD,*
Ajay K. Jain, MD,*‡ Martin T. Rothman, MD,*‡ Craig A. Thompson, MD, MMSC,§
Anthony Mathur, MD, PhD,*†‡ Andrew Wragg, MD, PhD,*†‡ Elliot J. Smith, MD*‡

London, United Kingdom; and New Haven, Connecticut



Mortality Benefit

- Single Center: London
- 2003-10
- 836 CTO PCI 70% successful
- 3.8 years FU
- $P < 0.0001$



Mortality Benefit

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CLINICAL RESEARCH

Long-Term Outcome of Percutaneous Coronary Intervention for Chronic Total Occlusions

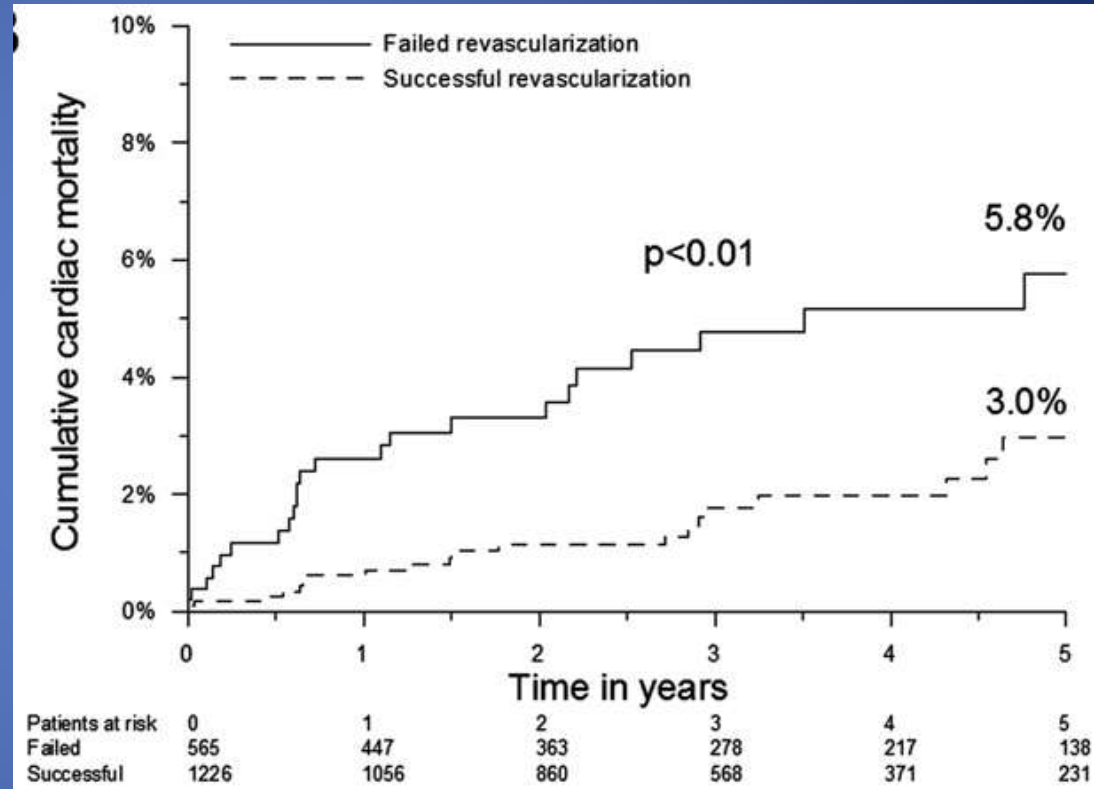
Roxana Mehran, MD,^{*} Bimmer E. Claessen, MD,^{†§} Cosmo Godino, MD,[‡]
George D. Dangas, MD, PhD,^{*} Kotaro Obunai, MD,[†] Sunil Kanwal, MD,[†]
Mauro Carlino, MD,[‡] José P. S. Henriques, MD, PhD,[§] Carlo Di Mario, MD,^{||}
Young-Hak Kim, MD,[¶] Seung-Jung Park, MD,[¶] Gregg W. Stone, MD,[†]
Martin B. Leon, MD,[†] Jeffrey W. Moses, MD,[†] Antonio Colombo, MD,[‡]
on behalf of the Multinational Chronic Total Occlusion Registry

*New York, New York; Milan, Italy; Amsterdam, the Netherlands; London, United Kingdom;
and Seoul, South Korea*



Mortality Benefit

- 3 centers
 - USA, Italy, Korea
- 1998-2007
- 1,791 pts- 1,852 CTO
PCI 68% success
- 2.9 year FU
- BM and DES



Mortality Benefit

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ORIGINAL INVESTIGATIONS

Long-Term Follow-Up of Elective Chronic Total Coronary Occlusion Angioplasty



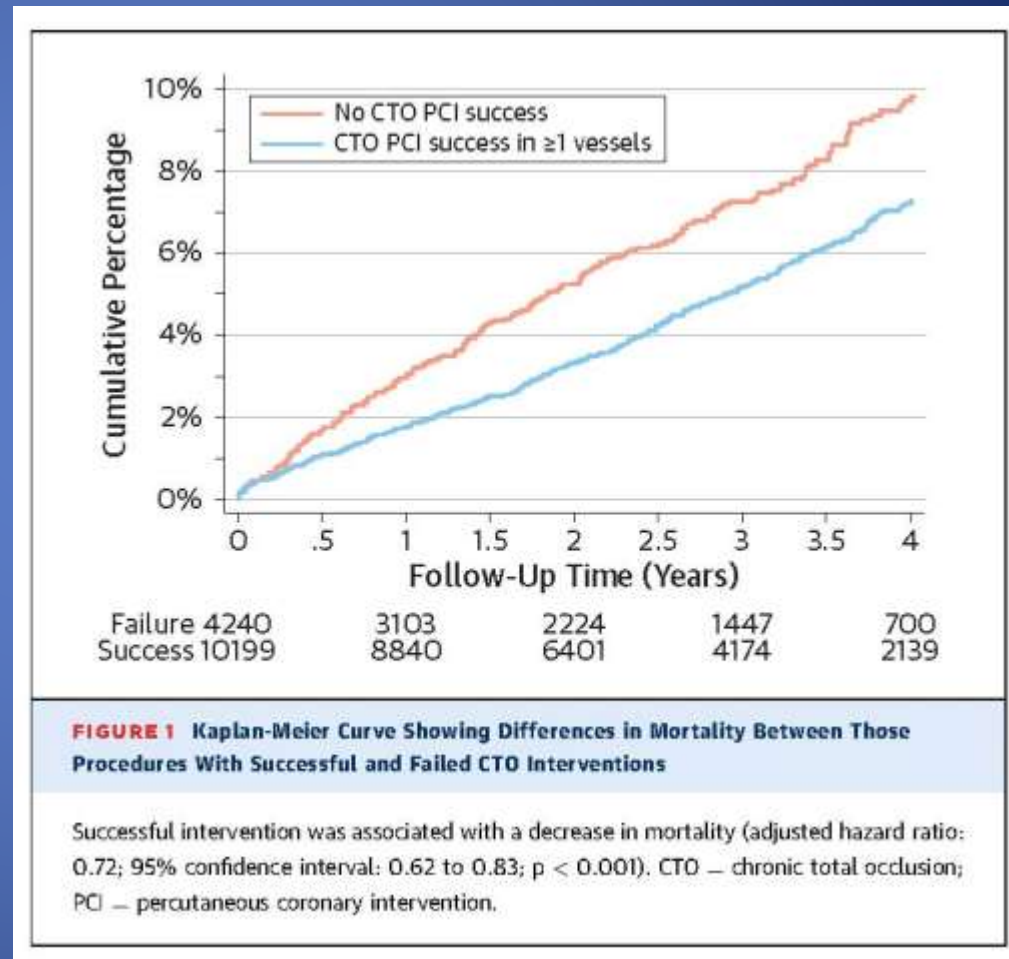
Analysis From the U.K. Central Cardiac Audit Database

Sudhakar George, MD,* James Cockburn, MD,* Tim C. Clayton, MSc,† Peter Ludman, MD,‡ James Cotton, MD,§
James Spratt, MA,|| Simon Redwood, MD,# Mark de Belder, MD,¶ Adam de Belder, MD,* Jonathan Hill, MA,**
Angela Hoye, MBS, PhD,†† Nick Palmer, MD,‡‡ Sudhir Rathore, MD,§§ Anthony Gershlick, MB BS,|||
Carlo Di Mario, MD, PhD,## David Hildick-Smith, MD,* on behalf of the British Cardiovascular Intervention Society

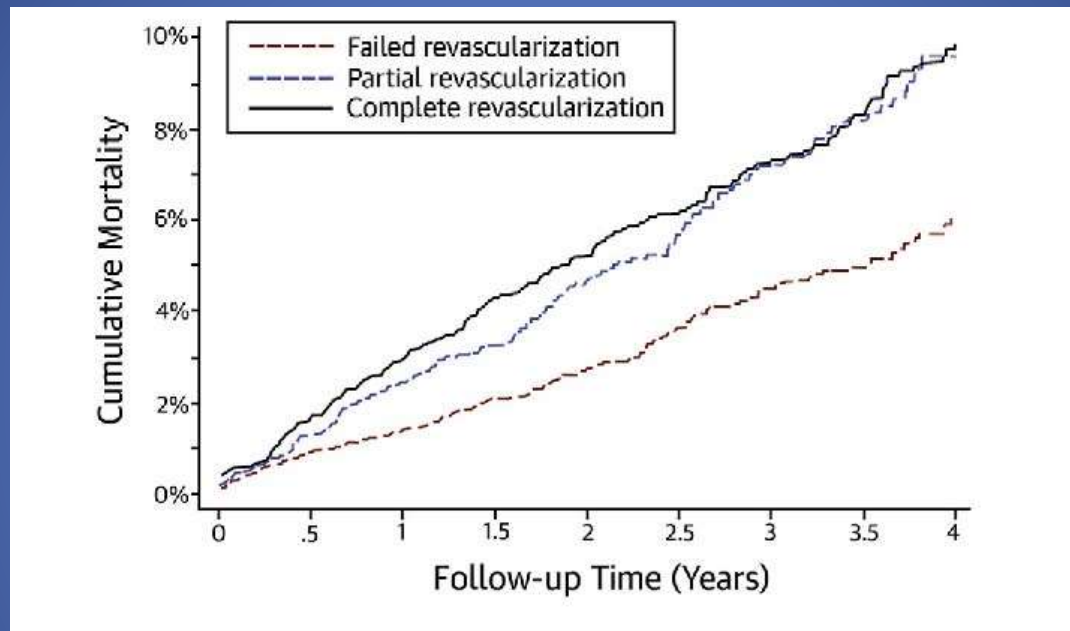


Mortality Benefit

- UK cardiac database
 - All PCI procedures
- 1/05-12/09
- 13,443 pts-14,439 CTO PCI with 70.6% success
- 2.65 year follow up



Survival Benefit Greatest with Complete Revascularization



CENTRAL ILLUSTRATION Outcomes for Complete, Partial, and Failed CTO Revascularization

Kaplan-Meier curve showing mortality in procedures with successful, partially successful, and failed chronic total occlusion (CTO) intervention. Adjusted hazard ratios for complete CTO revascularization are 0.70 (95% confidence interval: 0.56 to 0.87) versus partial revascularization and 0.61 (95% confidence interval: 0.50 to 0.74) versus failed revascularization.

OAT (Occluded Artery Trial) Trial

- 2,166 stable patients with a total occlusion of the infarct-related artery (IRA)
- Randomized 3 to 28 days post MI to optimal medical therapy with or without PCI plus stenting
- No benefit with PCI
 - majority of patients were asymptomatic, with single-vessel or double-vessel disease that was NOT associated with severe inducible myocardial ischemia.
- **NOT a CTO trial**

*N Engl J Med 2006;355:2395-2407.
J Am Coll Cardiol Intv 2008;1:511-520*



Quality of Life Benefit

- Cardiac MRI Study of CTO PCI
 - 6 month Angina improvement: Successful CTO PCI 76% vs. 17% medically treated CTO ($p < 0.05$)
 - Cheng et al. *J Am Coll Cardiol Intv* 2008;1:44–53
- Meta-analysis of successful vs failed CTO PCI
 - 6 yr FU-significant reduction in recurrent angina: Odd ratio 0.45 with 95% CI (0.30-0.67)
 - Joyal et al. *AHJ* 2010;160:179-87



CTO PCI is beneficial

- Mortality Benefit: YES
- Quality of Life Benefit: YES



Thank You



Thank You

