

Hybrid Coronary Intervention

Mukta C. Srivastava¹
Jeffrey D. Lee²

¹University of Maryland Medical Center, Division of Cardiology

²University of Maryland Medical Center, Division of Cardiac Surgery

Disclosures

- **Mukta C. Srivastava, MD**
 - None

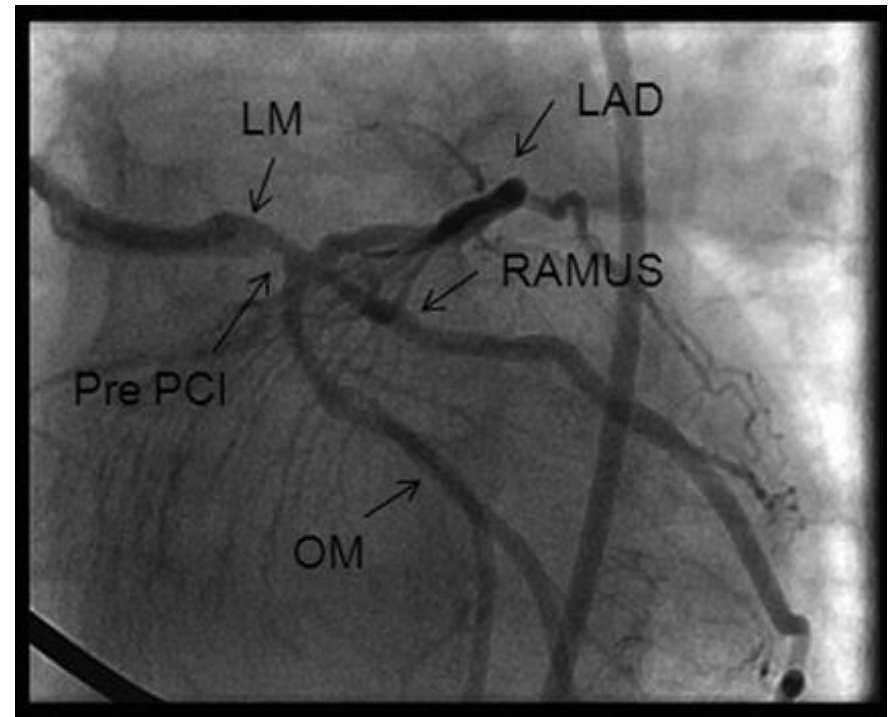
- **Jeffrey D. Lee, MD**
 - None

Case

- **57 year old gentleman with a history of hypertension and previous heavy tobacco use history**
- **He presented to our institution with chest pain and on evaluation was found to have a non-ST elevation myocardial infarction and globally depressed left ventricular function with an EF of 20%**

Case

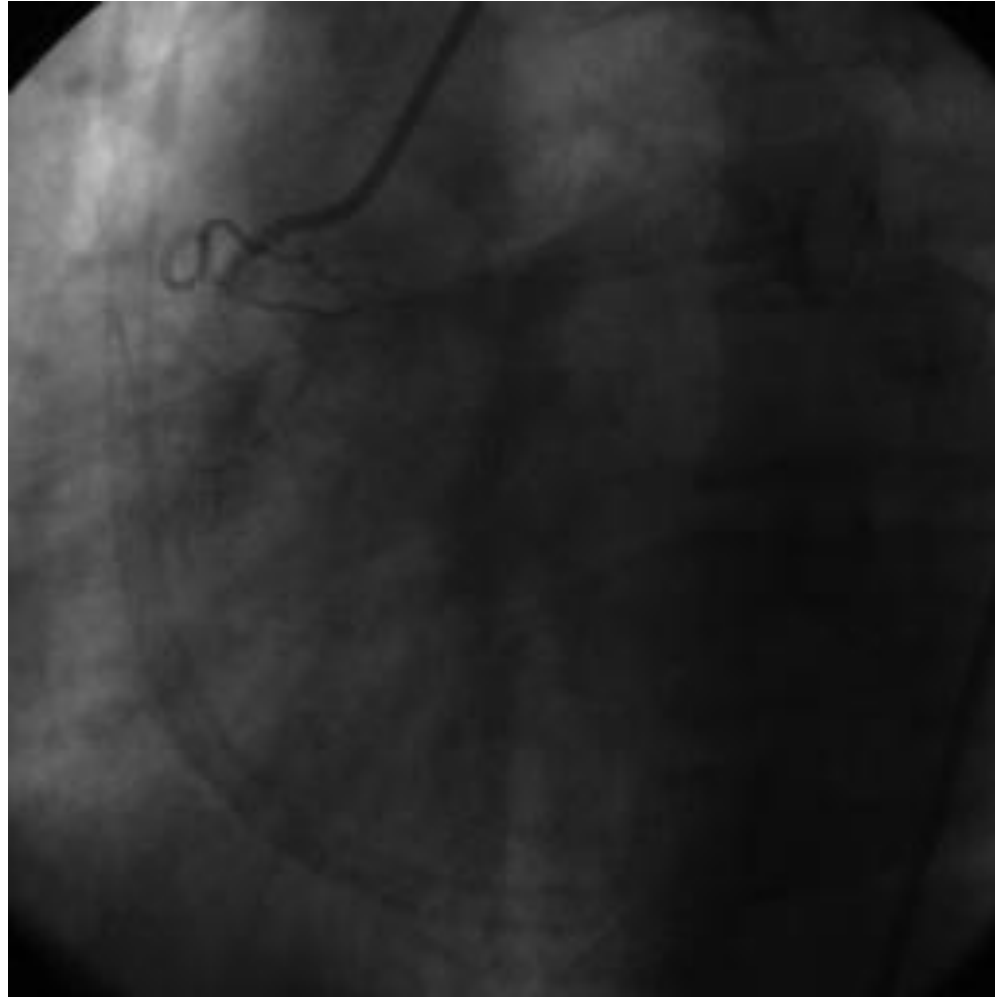
- The patient underwent coronary angiography demonstrating a severe distal left main lesion at the trifurcation of the LAD, circumflex and Ramus vessels
- Additionally, the RCA was noted to be totally occluded with left to right collaterals



Case



Case



Case

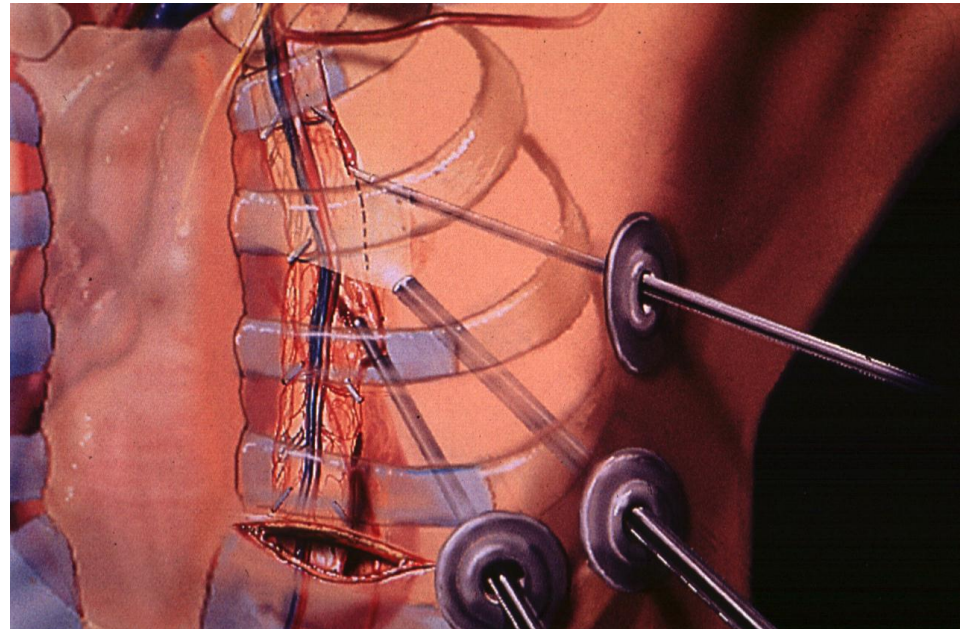
- **His SYNTAX score was calculated to be > 30**
- **His STS score was calculated to be > 1% for surgical mortality and > 18% for surgical morbidity**
- **Complete revascularization would require 4 by-pass grafts**

Case

- **A hybrid coronary intervention (HCI) strategy was planned with minimally-invasive surgical revascularization combined with percutaneous coronary intervention (PCI) to provide complete revascularization while reducing surgical and PCI risk**

Case

- **Totally endoscopic coronary artery bypass (TECAB) was performed utilizing the da Vinci robotic-assist device**
- **Bilateral internal thoracic arteries were harvested completely endoscopically**
- **The left radial artery was harvested as well**



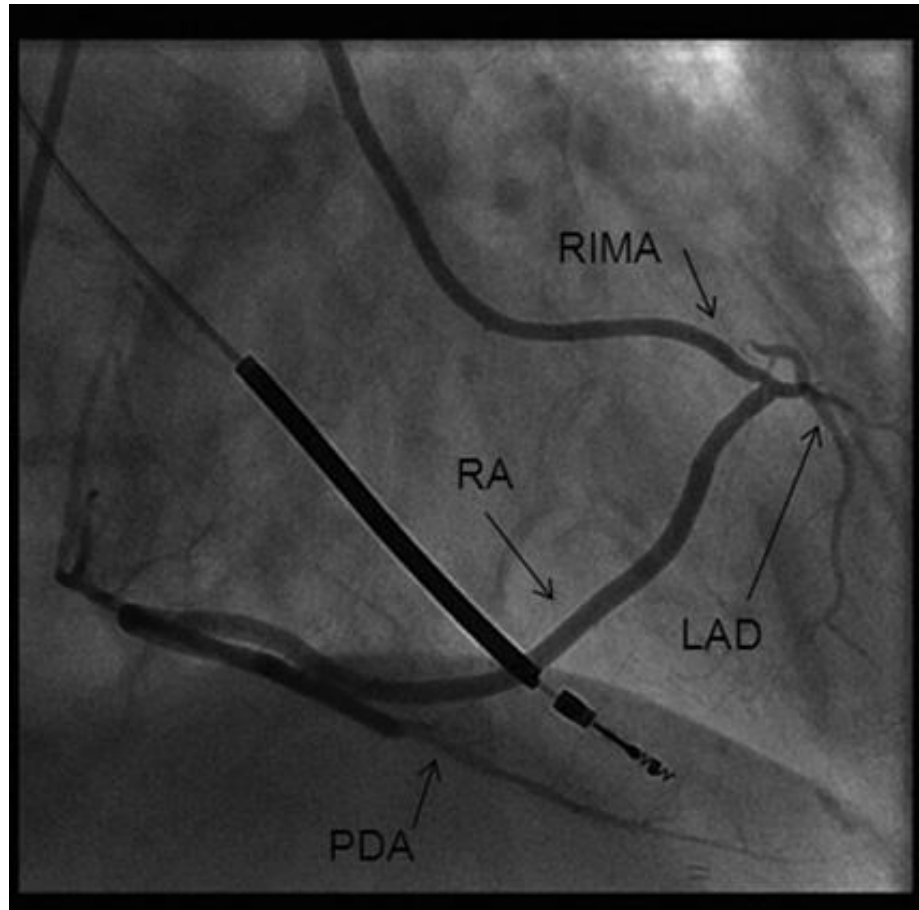
Robotic TECAB - Beating Heart Approach

Jeffrey D. Lee, MD Johannes Bonatti MD

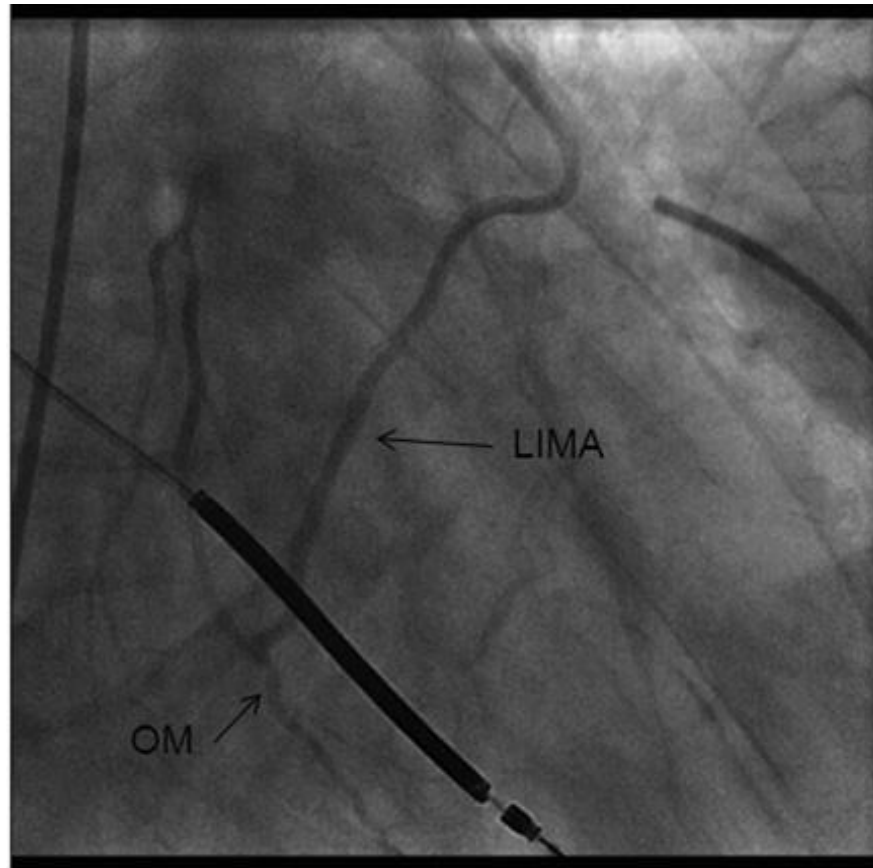
Case

- **The right internal mammary artery was grafted to the LAD and a Y-graft composed of the left radial artery was anastomosed to the right PDA**
- **The left internal mammary artery was grafted to the obtuse marginal artery**

TECAB

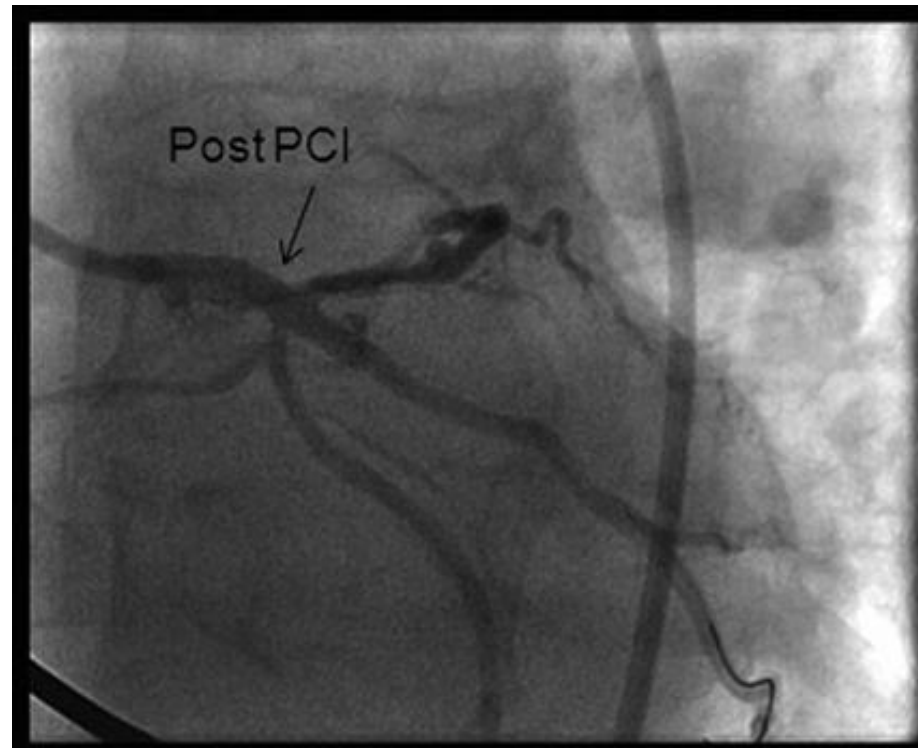


TECAB

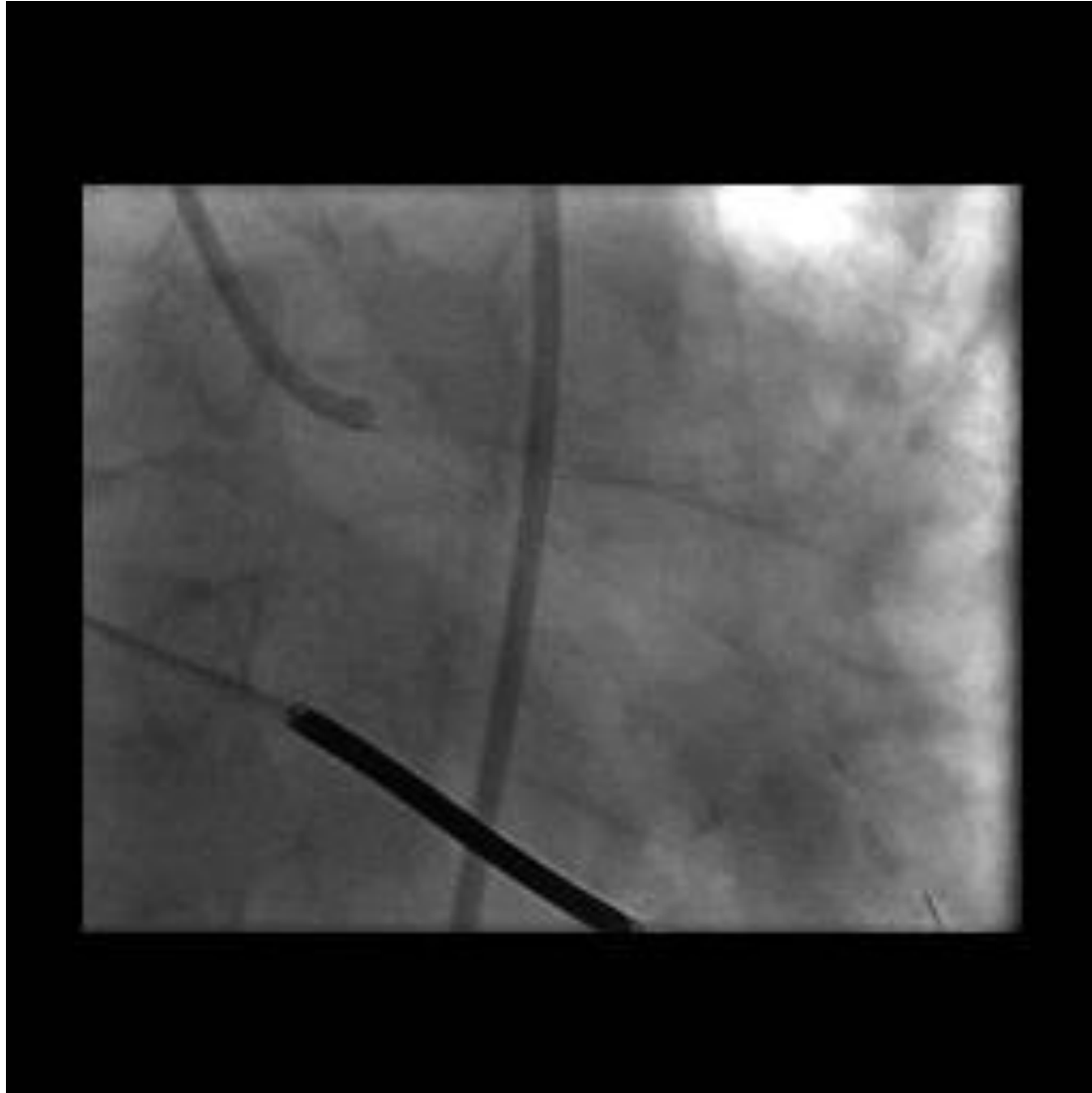


Case

- Subsequently, PCI was performed with a drug-eluting stent from the Left Main into the Ramus vessel

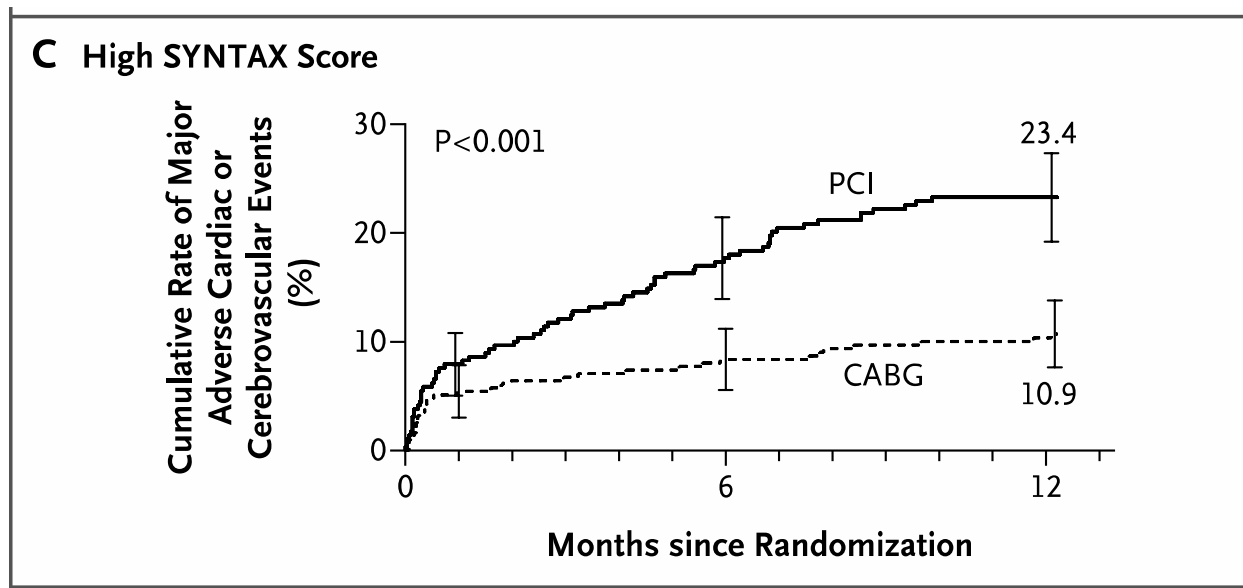


Case



Discussion

- High-syntax score lesion subsets are predicted to have increased MACCE when revascularized via PCI compared with CABG



Discussion

- **However, STS scoring still predicts high surgical morbidity in this patient with traditional coronary artery bypass grafting with median sternotomy and central bypass**

Discussion

- **The HCl strategy has distinct advantages:**
 - **A minimally-invasive, totally endoscopic approach is associated with earlier functional recovery with reduced surgical morbidity**
 - **Provision of all arterial grafts in conjunction with drug-eluting stents may result in more durable re-vascularization compared with saphenous vein grafts**

Discussion

- **An additional feature of the HCl approach is that each revascularization arm is simplified:**
 - **PCI after TECAB is performed with a lesser ischemic burden and without the need for bifurcation stenting**
 - **Similarly, bypass grafting is performed with the need for fewer planned bypasses**

Discussion

- **Unresolved issues regarding the HCI approach include:**
 - **Optimal anti-platelet and anti-coagulation regimen**
 - **Optimal sequence of revascularization**
 - **Steep learning curve associated with minimally-invasive surgical techniques**

Conclusions

- **A hybrid coronary intervention strategy combines the benefits of minimally-invasive surgical revascularization techniques with PCI to provide all-arterial and drug-eluting stent revascularization with reduced surgical and PCI complexity**