

Minimally Invasive Direct Coronary Artery Bypass With Robotic Assistance in a Reoperative Setting

David Zapata MD, Kevin Ho BA, Hannah Frederick BS, Josue Gutierrez MD

Background

Multivessel coronary artery disease (CAD) is typically treated with coronary artery bypass grafting (CABG) via median sternotomy. However, reoperative CABG carries increased risk due to adhesions and prior grafts.

Hybrid coronary revascularization (HCR) combines minimally invasive direct coronary artery bypass (MIDCAB) with percutaneous coronary intervention (PCI), offering a less invasive alternative.

Case Description

Patient: 83-year-old-male

History: Aortic valve replacement (12 years prior), newly diagnosed prostate cancer, multivessel CAD (LAD, ramus intermedius, PDA).

Given requirement for future radiation and chemotherapy for prostate cancer, the patient expressed a strong preference for a minimally invasive approach.



Procedure

Staged HCR strategy:

- PCI placed in PDA due to its greatest severity (90% occlusion)
- Robotic assisted MIDCAB for LIMA mobilization 4 weeks later to minimize risks of early stent thrombosis

MIDCAB:

- DAPT held with enoxaparin bridge prior to surgery
- Robotic ports placed and pericardium opened with blunt dissection and electrocautery through adhesions on the anterior surface
- LAD assessed and deemed acceptable to proceed
- LIMA harvested as a pedicle in standard fashion
- 5cm mini-thoracotomy created above LAD for access
- LAD stabilized with Nuvo device
- LIMA-LAD anastomosis performed with 7-0 Prolene
- Patency confirmed via Doppler

Outcome

Patient had an uneventful recovery and was discharged on POD6 ambulating independently. Began cancer treatment two months later

Advantages:

- Minimally invasive--reducing hospital stay, bleeding, and deep wound infection
- Avoids cardiopulmonary bypass while preserving the benefit of arterial revascularization

MIDCAB is a safe and effective option for high-risk reoperative patients, especially when comorbidities necessitate rapid recovery.

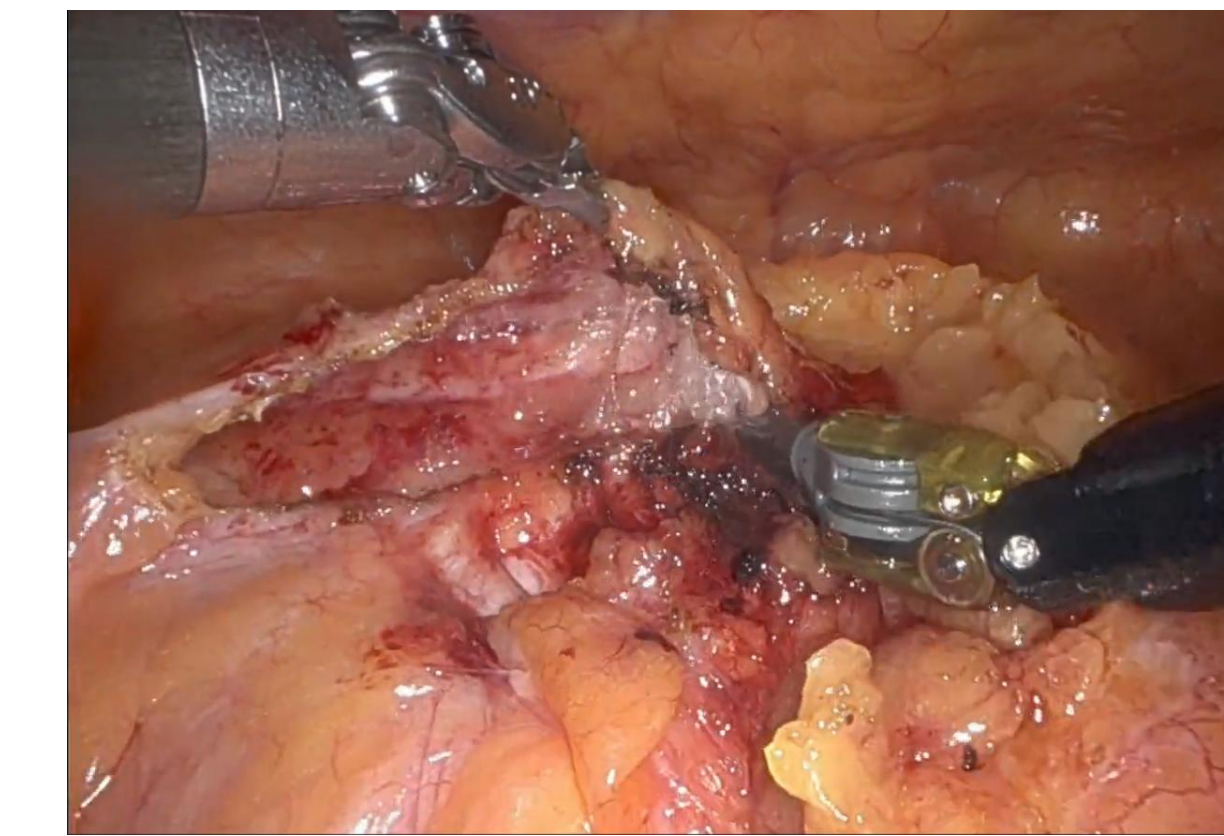


Figure 1. LAD exposure and mobilization



Figure 2. LIMA harvest in pedicled fashion



Figure 3. LIMA-LAD anastomosis through 5cm mini-thoracotomy



Figure 4. Result of final incision