Redo MIDCAB: Tailoring Surgical Approach and Conduit Configuration Based on Target Vessel

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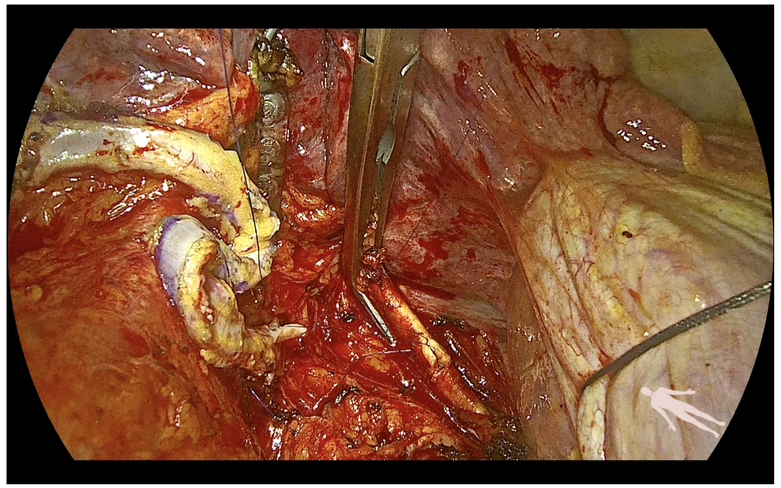
Objective

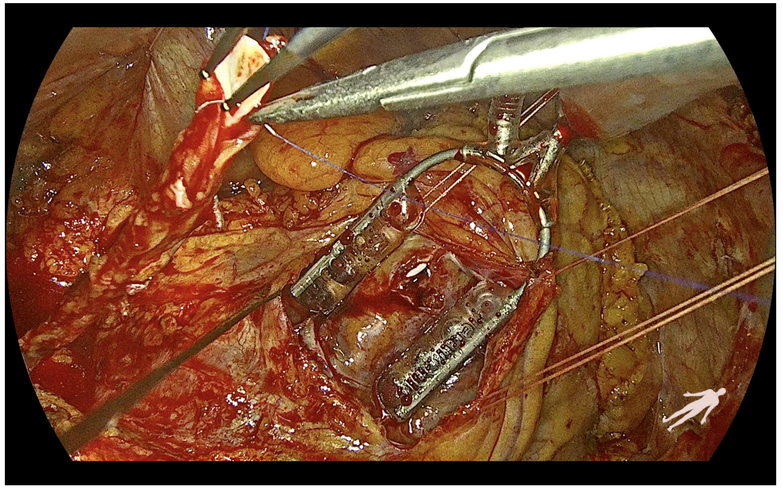
Redo coronary artery bypass grafting (CABG) remains one of the most challenging coronary operations, primarily due to the need for repeat sternotomy, dense mediastinal adhesions, and the risk of injury to patent grafts. Advances in minimally invasive coronary surgery (MICS) may offer a compelling alternative. We report our early experience with off-pump redo minimally invasive direct coronary artery bypass grafting (MIDCAB), evaluating its potential role as a modern paradigm within a dedicated coronary revascularization program.

Patient	Age, Sex	Previous surgery	Surgical Indications	Target vessel and (graft status)	Surgical Approach	Conduit Configuration
1	78,M	CABG x3 in 1992	Refractory stable angina, 3 PCI attempt	SVG to OM occluded (Lima to LAD and SVG to PDA patent)	Left Lateral Small Thoracotomy	SVG from descending thoracic aorta to OM
2	78,M	CABG x1 in 1988	NSTEMI, Complex lesion of LMCA 95% occlusion	LAD (RIMA to RCA patent)	Left Anterior Minithoracotomy	LIMA to LAD + PCI to LCx
3	54,M	CABG x4 in 2018	Unstable angina, multiple PCI on LAD with ISR	LIMA to LAD occluded (SVG to D1-OM and SVG to PDA patent)	Left Anterior Minithoracotomy	RIMA extended "I" graft Radial artery to LAD
4	55,M	CABG x2 in 2009	Refractory stable angina, multiple PCI on LCx with ISR	OM (LIMA to LAD and SVG to PDA patent)	Left Lateral small Thoracotomy	SVG from descending thoracic aorta to OM
5	61,M	CABG x2 in 2008	Unstable angina, LAD CTO, OM CTO, failed PCI	LAD (SVG to LAD occluded, SVG to PDA patent)	Left Anterior Minithoracotomy	LIMA to LAD
6	77,M	CABG x2 in 1999	Refractory stable angina, OM CTO with failed PCI	OM (LIMA to LAD and SVG to RCA patent	Left Lateral small Thoracotomy	Radial artery from descending thoracic aorta to OM
7	68,M	CABG x3 in 2024	Unstable Angina, LAD CTO	LAD (LIMA to LAD occluded, SVG to OM and PDA patent)	Left Anterior Minithoracotomy	RIMA extended "I" graft Radial artery to LAD
8	75,M	CABG x1 in 1996	Refractory stable angina, multiple PCI to LAD with ISR	LAD (RIMA to RCA patent)	Left Anterior Minithoracotomy	LIMA to LAD

Methods:

The study involves a retrospective review of consecutive patients undergoing redo MIDCAB procedures between January 2022 and December 2025. All procedures were performed through a small thoracotomy approach without cardiopulmonary bypass. Primary endpoints were in-hospital mortality and major adverse cardiac/cerebrovascular events. Secondary endpoints included conversion to sternotomy, transfusion requirements, ventilation time, and intensive care unit (ICU), and hospital stay.





Results

The case series includes 8 male patients (mean age 68 ± 10 years) who underwent minimally invasive redo MIDCAB (5 elective, 3 urgent). PCI option was exhausted in all patients. Of these, 3 patients had unstable angina, 1 NSTEMI, and 4 chronic stable angina. 5 patients were diabetic. All patients required revascularization of only one target vessel.

Minimally invasive access was obtained via a small thoracotomy, with the incision location tailored to the target coronary vessel. There were no in-hospital deaths, strokes, perioperative myocardial infarctions or conversion to sternotomy. No patient required postoperative blood transfusion. Two patients were extubated in the operating room. Median ventilation time and mean ICU length of stay was 2.3 and 27 ± 16 hours hours. The median hospital length of stay was 4 days.

Conclusion

Redo MIDCAB is safe and feasible in selected patients. Avoidance of a repeat sternotomy resulting in a quick postoperative recovery highlights the potential of this strategy as a modern paradigm for coronary reoperations, at least in patients requiring single-vessel revascularization.