

Mini-CABG: Redefining Coronary Revascularization Through Minimal Access

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Introduction

Coronary artery bypass grafting (CABG) remains the gold standard for treating complex coronary artery disease. Recent advances have enabled surgeons to perform selected bypass procedures through smaller incisions, giving rise to Minimally Invasive Coronary Artery Bypass Grafting (Mini-CABG). This approach combines the durability of surgical revascularization with the benefits of reduced surgical trauma.

What is Mini-CABG?

Mini-CABG is a coronary bypass operation performed through a small left thoracotomy (typically 5–8 cm) without dividing the sternum. The procedure commonly utilizes the left internal mammary artery (LIMA) to bypass the left anterior descending (LAD) artery and may be performed on a beating heart.

<u>Advantages</u>	<u>Patient Selection</u>	<u>Surgical Technique</u>	<u>Outcomes</u>	<u>Challenges</u>
Avoids median sternotomy	Ideal candidates include:	Small left anterior thoracotomy.	Studies have demonstrated:	Steeper learning curve
Smaller incision and improved cosmetic outcome	Isolated LAD disease	Harvesting of the LIMA under direct vision.	Excellent graft patency rates	Specialized instrumentation required
Reduced postoperative pain	Single or selected double-vessel coronary artery disease	Exposure of the target coronary artery.	Comparable long-term survival to conventional CABG	Limited exposure in complex multivessel disease
Lower blood loss and transfusion requirements	Patients with high risk of sternal complications	Off-pump LIMA-to-LAD anastomosis.	Lower perioperative morbidity	Careful patient selection essential
Decreased risk of sternal wound infection	Obese patients	Hemostasis and closure without sternotomy.	High patient satisfaction	
Earlier mobilization and rehabilitation	Diabetics		Faster functional recovery	
Shorter ICU and hospital stay	Patients requiring rapid recovery			
Faster return to daily activities and work				

Discussion

Mini-CABG has emerged as an effective alternative to conventional coronary artery bypass surgery in appropriately selected patients. By avoiding median sternotomy and utilizing a small thoracotomy incision, the procedure significantly reduces surgical trauma while maintaining the long-term benefits of surgical revascularization. Patients often experience less postoperative pain, reduced blood loss, lower risk of wound complications, shorter hospital stays, and faster return to normal activities. Advances in surgical techniques and instrumentation have expanded the applicability of Mini-CABG, particularly for isolated LAD disease and selected multivessel coronary artery disease. Careful patient selection and surgical expertise remain essential to achieving optimal outcomes.

Conclusion

Mini-CABG represents a significant advancement in coronary revascularization, combining the durability and effectiveness of traditional bypass surgery with the benefits of a minimally invasive approach. It offers excellent clinical outcomes, enhanced patient recovery, and improved quality of life while minimizing the physical and psychological impact of surgery. As experience and technology continue to evolve, Mini-CABG is expected to play an increasingly important role in the management of coronary artery disease, providing patients with a safe, effective, and less invasive treatment option.