Journal of
Cardio - Thoracic Medicine

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Weight No Barrier: Anaortic Off-Pump Total Arterial CABG in a 107-kg Patient

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ARTICLEINFO

Article type:
Case Report

Article history:
Received: 30 July 2025
Accepted:25 October 2025

Keywords:
Anaortic OPCABG
LIMA-RIMA
Sequential grafting
Total arterial grafts
Triple vessel disease

ABSTRACT

Total arterial, anaortic off-pump coronary artery bypass grafting (OPCABG) is a refined surgical approach that minimizes the risks of cardiopulmonary bypass and aortic manipulation. This case report describes a 44-year-old male with triple vessel coronary artery disease who underwent successful total arterial anaortic OPCABG using in-situ bilateral internal mammary arteries. The left internal mammary artery (LIMA) was used for sequential grafting to obtuse marginal branches (OM1 and OM2), and the right internal mammary artery (RIMA) was grafted to the distal right coronary artery (DRCA). The postoperative course was uneventful, and the patient was discharged on postoperative day 3. This case highlights the safety and efficacy of total arterial anaortic OPCABG in high-risk individuals.

► *Doshi, C., Joshi, A.D., Modi, S., Thakut, G., Dangariya, M. Weight No Barrier: Anaortic Off-Pump Total Arterial CABG in a 107-kg Patient. J Cardiothorac Med. 2025; 13(4): 1626-1628.* ***Doi : 10.22038/jctm.2025.90077.1500***

Introduction

Coronary artery bypass grafting (CABG) remains a cornerstone in the treatment of complex multivessel coronary artery disease. Anaortic off-pump CABG (OPCABG) utilizing total arterial conduits avoids manipulation of the ascending aorta, thereby minimizing the risk of embolic stroke and aortic injury (1). In patients with favorable anatomy, bilateral in-situ internal mammary arteries (LIMA and RIMA) offer superior long-term patency and excellent clinical outcomes (2). This report details a case of total arterial anaortic OPCABG in a 107-kg patient with triple vessel disease, performed using right internal mammary artery (LIMA) sequential grafting to OM1 and OM2, and right internal mammary artery (RIMA) to distal right coronary artery (RCA).

Case Presentation

A 44-year-old male presented with a 2-month history of intermittent chest pain and exertional dyspnea (NYHA Class II). He underwent evaluation with a treadmill stress test, which was positive for inducible ischemia. Echocardiography revealed regional wall motion abnormality in the RCA territory with a preserved ejection fraction of 45%. ECG showed ST-segment elevation, and cardiac troponin levels were elevated.

Coronary angiography revealed triple vessel disease with significant stenosis: 80% in the mid-LAD, 80% in OM1 and OM2, and

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80% proximally in the RCA. The patient was advised to undergo an off-pump OPCABG with total arterial conduits.

Surgery was performed via median sternotomy. The LIMA was used in-situ for sequential grafting to OM1 and OM2, and the RIMA was used in-situ to graft the distal RCA. No cardiopulmonary bypass or aortic manipulation was required. The patient was extubated 15 hours postoperatively and had an uneventful recovery.

He was discharged on postoperative day 3. His height was 148 cm and weight 107 kg. No intraoperative or postoperative complications occurred.

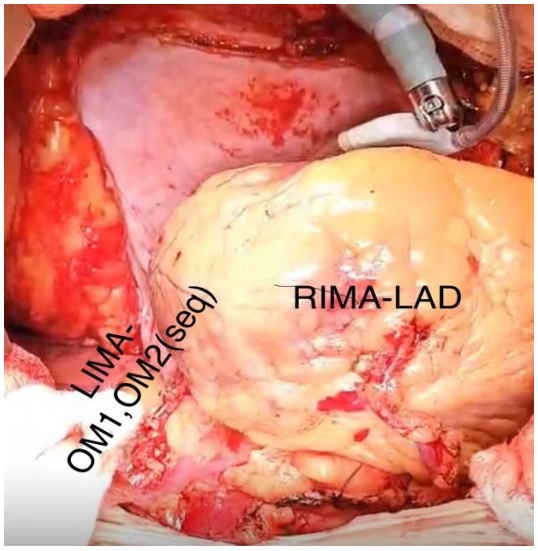

Figure 1. Intraoperative photograph showing in-situ LIMA sequential anastomosis to OM1 and OM2, and RIMA to LAD.

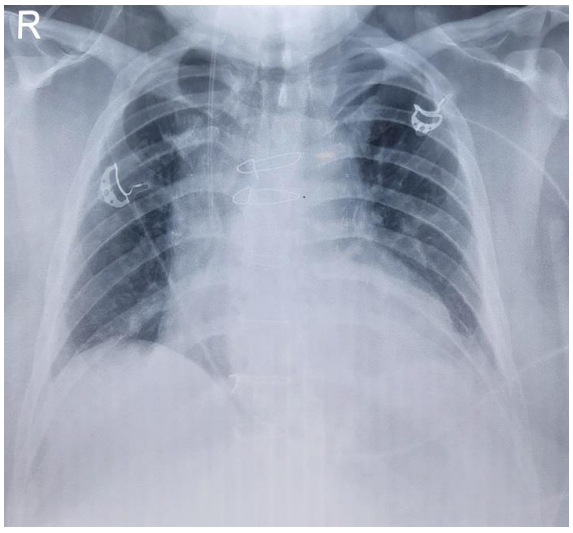

Figure 2. Immediate postoperative chest X-ray showing well-expanded lungs and sternal wires in place.

Discussion

Total arterial anaortic OPCABG is increasingly recognized as a safe and effective surgical strategy for coronary revascularization, particularly in patients at risk for aortic complications. Bilateral internal mammary arteries provide superior patency compared to vein grafts and are especially beneficial in younger patients with good target vessel quality (3).

Sequential grafting, as performed in this case, allows for complete revascularization using limited conduits, reducing the number of proximal anastomoses and maintaining excellent flow dynamics. Avoiding cardiopulmonary bypass and aortic clamping also reduces the risk of stroke, systemic inflammatory response, and renal complications key concerns in overweight patients (4).

This case underscores the viability of in-situ bilateral IMA grafting even in triple vessel disease, supporting the growing body of evidence favoring anaortic total arterial OPCABG in select patients.

Conclusion

Total arterial anaortic OPCABG using in-situ LIMA and RIMA grafts is a highly effective technique for multivessel coronary artery disease. Our case demonstrates the feasibility and safety of this approach even in a high-BMI patient, with rapid recovery and no complications.

Patient Consent

Written informed consent was obtained from the patient for the publication of this case report.

Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical Approval

This case report was conducted in accordance with institutional ethical guidelines.

Disclaimer

This case report is intended for educational purposes only. It does not substitute for professional medical advice, diagnosis, or treatment. The views expressed are those of the authors and not necessarily those of the institution.

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