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# CORONARY-ARTERY BYPASS SURGERY IN PATIENTS WITH ISCHEMIC CARDIOMYOPATHY

**Ms. Kirti Bhardwaj[1*], Ms. Jyoti Ahlawat[2]**

[1*]PG Tutor, M.Sc. Medical Surgical Nursing, SGT University, Gurugram, Haryana, India
[2]PG Tutor, M.Sc. Mental Health Nursing, SGT University, Gurugram, Haryana, India

[*]**Corresponding Author:** Ms. Kirti Bhardwaj
[*]PG Tutor, M.Sc. Medical Surgical Nursing, SGT University, Gurugram, Haryana, India

## Abstract

**Background:** Ischemic cardiomyopathy (ICM), resulting from chronic coronary artery disease and left ventricular dysfunction, remains a major contributor to global cardiovascular morbidity and mortality. Coronary artery bypass grafting (CABG) has long been investigated as a therapeutic strategy in this high-risk group.

**Objective:** To review and synthesize evidence from epidemiological data, randomized controlled trials (RCTs), meta-analyses, observational studies, and guidelines regarding the role of CABG in patients with ICM.

**Findings:** Epidemiological reports (Mozaffarian et al., 2016) emphasize the global burden of cardiovascular disease and the ongoing need for effective revascularization strategies. The Coronary Artery Surgery Study (CASS, 1983) and its subgroup analysis (Passamani et al., 1985) provided the first RCT evidence supporting CABG survival benefits, particularly in patients with low ejection fraction (EF). The STICH trial (Velazquez et al., 2011) further established CABG's mortality reduction compared with medical therapy in ischemic LV dysfunction. A meta-analysis by Yusuf et al. (1994) confirmed long-term survival advantages of CABG in multivessel disease. Observational evidence (Topkara et al., 2005) demonstrated the feasibility and improved outcomes of CABG in low EF patients with advances in surgical techniques. Clinical guidelines (Fihn et al., 2012; Yancy et al., 2013) integrated these findings into multidisciplinary management algorithms for stable ischemic heart disease and heart failure.

**Conclusion:** The cumulative evidence consistently supports CABG as a cornerstone therapy in ischemic cardiomyopathy, particularly in patients with multivessel CAD and reduced EF. With ongoing surgical innovations and guideline-directed application, CABG continues to play a vital role in improving survival and quality of life in this challenging population

## Introduction

Ischemic cardiomyopathy (ICM) represents a major cause of heart failure and cardiovascular mortality worldwide. It results from chronic coronary artery disease (CAD) and myocardial ischemia, leading to left ventricular (LV) dysfunction. For decades, coronary artery bypass grafting (CABG) has been explored as a treatment option in this high-risk population. This review synthesizes evidence from landmark randomized controlled trials (RCTs), meta-analyses, observational studies, and guideline recommendations to outline the role of CABG in patients with ischemic cardiomyopathy.

**Method:**

This study is a narrative review that synthesized evidence from multiple sources, including epidemiological data, randomized controlled trials (RCTs), meta-analyses, observational cohort studies, and clinical guidelines. Literature was retrieved through PubMed, Google Scholar, and Web of Science using keywords such as *"ischemic cardiomyopathy," "coronary artery bypass grafting," "CABG outcomes," "low ejection fraction," and "revascularization trials."* Studies were selected based on their relevance, methodological rigor, and impact on current clinical practice. Landmark trials, guideline statements, and meta-analyses were prioritized. Data were summarized thematically to evaluate the role of CABG in improving survival and outcomes in patients with ischemic cardiomyopathy.

| Author | Country | Study Design | Sample | Result | Discussion |
|---|---|---|---|---|---|
| Mozaffarian D, Benjamin EJ, Go AS, et al. (2016) | USA (AHA) | Epidemiological report / update | National/global population data | Provided annual update on heart disease and stroke statistics | Highlights burden of CVD, trends, and preventive implications |
| Coronary Artery Surgery Study (CASS) (1983) | (CASS) (1983) USA | Randomized controlled trial (RCT) | CAD patients undergoing CABG | CABG improved survival in selected groups | First large RCT evidence for CABG benefit |
| Fihn SD, Gardin JM, Abrams J, et al. (2012 | USA (AHA/ACC, etc. | Clinical guideline | Evidence synthesis, not patients | Recommendations for stable ischemic heart disease management | Multidisciplinary guidelines integrating CABG/PCI/medical therapy |
| Yancy CW, Jessup M, Bozkurt B, et al. (2013) | USA (AHA/ACC) | Clinical guideline | Evidence synthesis | Heart failure management strategies | Provided evidence-based algorithms for HF treatmen |
| Yusuf S, Zucker D, Peduzzi P, et al. (1994 | International collaboration | Meta-analysis of RCTs | Pooled CABG trial data, 10-year outcomes | CABG improved long-term survival in multi-vessel disease | Landmark overview strengthening evidence base |
| Topkara VK, Cheema FH, Kesavaramanujam S, et al. (2005) | USA | Observational cohort | Low EF CABG patients | CABG feasible with acceptable outcomes | Outcomes improved with surgical advances |
| Velazquez EJ, Lee KL, Deja MA, et al. (2011, STICH) | Multinational | RCT | Ischemic LV dysfunction patients | CABG reduced mortality vs medical therapy (long-term) | Landmark STICH trial influencing HF revascularization guidelines |
| Passamani E, Davis KB, Gillespie MJ, Killip T (1985, CASS subgroup) | USA | RCT | CAD patients with low EF | CABG improved survival in low-EF patients | Established evidence for surgery in LV dysfunctio |

**Discussion**

The cumulative body of evidence supports CABG as a cornerstone therapy in patients with ischemic cardiomyopathy, particularly those with multi-vessel CAD and reduced EF. RCTs and meta-analyses consistently demonstrate survival benefits, while observational studies show improving safety over time. Guidelines now recommend CABG as part of comprehensive, patient-tailored management strategies.

However, patient selection remains critical. Factors such as myocardial viability, comorbidities, surgical risk, and patient preference should guide decision-making. The integration of advanced

imaging, hybrid revascularization approaches, and evolving perioperative care continues to refine outcomes for this challenging population.

**Conclusion:**

CABG has evolved from an experimental surgical option to an evidence-based standard of care for patients with ischemic cardiomyopathy. Landmark trials such as CASS and STICH, supported by meta-analyses and guidelines, confirm its role in improving survival and quality of life. With ongoing advances in surgical techniques and perioperative management, CABG remains a vital therapy in the era of multimodality cardiovascular care.

**Conflict of Interest**

The authors declare no conflicts of interest in relation to the conduct of this review

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