

OPTIMIZATION OF SURGICAL TREATMENT STRATEGIES IN PATIENTS WITH CORONARY ARTERY DISEASE COMPLICATED BY ISCHEMIC MITRAL REGURGITATION

Shavkat Atazhanov Dilmurod ugli

Cardiac Surgeon, Republican Specialized Scientific and Practical Medical Center of
Emergency Medical Care

Abstract

Coronary artery disease (CAD) complicated by ischemic mitral regurgitation (IMR) represents a significant clinical challenge in cardiovascular surgery. The coexistence of myocardial ischemia, left ventricular remodeling, and mitral valve dysfunction increases the complexity of treatment and may adversely affect long-term outcomes. This article examines approaches to optimizing surgical treatment strategies for patients with CAD and IMR, focusing on preoperative assessment, coronary revascularization, mitral valve repair or replacement, and individualized risk evaluation. The importance of echocardiographic examination, assessment of ventricular function, and multidisciplinary decision-making is emphasized. Contemporary evidence supports tailoring treatment to the severity of mitral regurgitation, coronary anatomy, myocardial viability, ventricular remodeling, and operative risk. A personalized approach can help improve clinical decision-making and reduce the likelihood of persistent or recurrent mitral regurgitation.

Keywords: coronary artery disease, ischemic mitral regurgitation, coronary artery bypass grafting, mitral valve repair, mitral valve replacement, cardiac surgery, ventricular remodeling, surgical outcomes.

Introduction

Coronary artery disease is a major cause of cardiovascular morbidity and mortality worldwide. In some patients, myocardial ischemia and infarction lead to structural and functional changes in the left ventricle, contributing to the development of ischemic mitral regurgitation. Unlike primary mitral valve disease, ischemic mitral regurgitation commonly results from impaired ventricular geometry, papillary muscle displacement, and restricted movement of the mitral valve leaflets. These

changes prevent effective leaflet coaptation and allow blood to flow backward into the left atrium during systole.

The coexistence of CAD and ischemic mitral regurgitation complicates treatment because restoring coronary blood flow may not fully correct the underlying valve dysfunction. Consequently, selecting an appropriate surgical strategy requires comprehensive evaluation of the coronary arteries, mitral valve apparatus, ventricular function, and overall clinical condition. The 2025 European Society of Cardiology and European Association for Cardio-Thoracic Surgery guidelines emphasize individualized, multidisciplinary assessment in the management of complex valvular disease [1].

Main Discussion

Preoperative evaluation is essential for optimizing surgical treatment. Transthoracic echocardiography provides information about mitral regurgitation severity, left ventricular ejection fraction, chamber dimensions, leaflet tethering, and pulmonary pressures. Transesophageal echocardiography may provide additional anatomical detail when required. Coronary angiography or coronary computed tomography, depending on the clinical circumstances, helps determine the distribution and severity of coronary lesions and the feasibility of revascularization. The choice of treatment depends primarily on the severity of mitral regurgitation and the indication for coronary revascularization. Coronary artery bypass grafting (CABG) is an established option for patients with significant coronary disease when surgical revascularization is appropriate. In patients with severe ischemic secondary mitral regurgitation who require CABG, concomitant mitral valve surgery is generally recommended, unless surgical risk or coronary anatomy favors an alternative strategy [1].

For moderate ischemic mitral regurgitation, the decision is more complex. Evidence from randomized studies indicates that adding mitral valve repair to CABG can reduce residual mitral regurgitation but does not consistently improve survival or other major clinical outcomes. The Cardiothoracic Surgical Trials Network study found no significant advantage in left ventricular reverse remodeling or survival from routinely adding mitral repair to CABG in patients with moderate

ischemic mitral regurgitation, although the combined procedure reduced the prevalence of residual moderate or severe regurgitation [2]. Therefore, treatment decisions should balance potential valve-related benefits against longer operative duration and additional perioperative risks.

Mitral valve repair and replacement are the principal surgical options when intervention is indicated. Restrictive annuloplasty can restore leaflet coaptation in selected patients by reducing annular dimensions. However, repair may be less durable when substantial ventricular dilation and leaflet tethering persist. In such cases, recurrent regurgitation may develop despite technically successful surgery. Mitral valve replacement may therefore be appropriate for selected patients with severe ventricular remodeling or a high predicted risk of recurrent regurgitation after repair. The choice should account for anatomical characteristics, ventricular function, comorbidities, expected durability, and the patient's preferences. Subvalvular procedures may also be considered in selected cases, although their role depends on individual anatomy and surgical expertise.

Optimization further requires careful perioperative management. Guideline-directed medical therapy for heart failure, appropriate management of arrhythmias, renal function assessment, and prevention of thromboembolic complications contribute to comprehensive care. Postoperative echocardiographic surveillance is important for detecting residual or recurrent mitral regurgitation and monitoring ventricular recovery.

Conclusion

Optimizing surgical treatment for patients with coronary artery disease complicated by ischemic mitral regurgitation requires an individualized, evidence-based strategy. The severity of regurgitation, coronary anatomy, ventricular remodeling, myocardial function, and operative risk should guide the choice between CABG alone and combined coronary and mitral valve surgery. Although concomitant intervention is generally recommended for severe ischemic mitral regurgitation requiring surgery, routine mitral repair in moderate disease should be considered selectively. Comprehensive imaging, multidisciplinary evaluation, appropriate perioperative management, and long-term follow-up are essential components of effective care.

Further clinical research is needed to refine patient selection and improve the durability of surgical outcomes.

References

- 1.Хайдарова К. А. ХИМИЧЕСКАЯ ПРОМЫШЛЕННОСТЬ РЕСПУБЛИКИ УЗБЕКИСТАН И ПРОБЛЕМЫ СДЕРЖИВАЮЩИЕ РАЗВИТИЯ ДАННОЙ ОТРАСЛИ //Интернаука. – 2017. – №. 6-2. – С. 5-6.
- 2,Kakhramonovna K. F. T. K. N. et al. Marketing research management in the digital economy //Confrencea. – 2025. – Т. 6. – №. 6.
- 3.Хайдарова К. А., Bakhtiyorova M. B. Digital economy in enterprises II //Экономика и социум. – 2022. – №. 11-1 (102). – С. 348-351.
- 4.Хайдарова К., Khaydarova K. Differensiyalangan Marketing Strategiyasining Mohiyati Va Uning Samaradorligi //Advanced Economics and Pedagogical Technologies. – 2025. – Т. 2. – №. 3. – С. 49-54.
- 5.Хайдарова К. А. СОВЕРШЕНСТВОВАНИЕ МЕТОДИКИ ПРОВЕДЕНИЯ МАРКЕТИНГОВЫХ ИССЛЕДОВАНИЙ В ХИМИЧЕСКОЙ ОТРАСЛИ //Science and innovation. – 2024. – Т. 3. – №. Special Issue. – С. 191-192.
- 6.Хайдарова К. А., Инатова Н. А. ПЕРСПЕКТИВЫ ВНЕДРЕНИЯ СИСТЕМЫ НАССР НА ПРЕДПРИЯТИЯХ ПИЩЕВОЙ ПРОМЫШЛЕННОСТИ //Интернаука. – 2018. – №. 19-2. – С. 27-28.