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Minimally Invasive Mitral Valve Surgery: Evidence from Meta-Analyses and a Case-Based Perspective on Surgical Access

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Introduction: Minimally invasive mitral valve surgery (MIMVS) has become an established alternative to conventional median sternotomy. Comparative evidence suggests that MIMVS is associated with longer cardiopulmonary bypass (CPB), cross-clamp, and total operative times, while major safety outcomes are broadly comparable to those of conventional sternotomy. Some meta-analyses have reported shorter intensive care and hospital stays following minimally invasive surgery. These findings emphasize that incision size alone does not determine clinical benefit; surgical access should account for myocardial protection, procedural complexity, patient characteristics, and surgical team experience.[1-4]

Clinical case: 67-year-old patient with severe mitral regurgitation due to posterior mitral leaflet dysfunction underwent mitral valve surgery through a mini-sternotomy. Preoperative echocardiography showed left ventricular end-diastolic and end-systolic diameters of 6.6 cm and 4.2 cm, respectively, a left atrial diameter of 5.2 cm, left ventricular mass index of 168 g/m², relative wall thickness of 0.39, no regional wall motion abnormalities of the left ventricle, right ventricular systolic function with a TAPSE of 19 mm, and estimated pulmonary artery systolic pressure of 50 mmHg. The post-repair echocardiographic assessment demonstrated trace of residual mitral regurgitation. The postoperative course was notable for transient bradycardia; however, the patient was discharged home in sinus rhythm

Conclusion: MIMVS offers an alternative to conventional sternotomy, with potential recovery benefits and broadly comparable major safety outcomes but may require longer operative and CPB times. Mini-sternotomy can provide a balanced approach in selected patients. Surgical access should be individualized to optimize procedural safety, myocardial protection, and clinical outcomes.

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