

ACCESS AND VALUE: CLINICAL AND ECONOMIC OUTCOMES IN MINIMALLY INVASIVE VENTRICULAR SEPTAL DEFECT REPAIR

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INTRODUCTION :

Minimally invasive surgery (MIS) for congenital heart disease has increasing popularity recently, mainly due to its advantages in recovery and cosmesis aspect compared with conventional median sternotomy. While cosmetic contentment is an anticipated benefit, the health-economic indicators remain limited. This study evaluates perioperative and economic outcomes of MIS approach versus conventional median sternotomy for ventricular septal defect (VSD) repair.

METHODS :

A retrospective comparative analysis was conducted in patients who underwent VSD repair in between January 2022 to June 2025 at the National Heart Institute, Kuala Lumpur. The outcome included Cardiopulmonary bypass (CPB) time, aortic cross-clamp (ACC) time, surgery duration, total intensive care unit (ICU) and hospital stay, perioperative complications and total treatment cost.

RESULTS :

A total of 91 patients were analysed (MIS, n=35; sternotomy, n=56) with well-balanced demographic backgrounds and operative procedures. MIS was associated with longer operative parameters: CPB time (74.0 vs 57.5 min, $p=0.004$), ACC time (51.0 vs 36.5 min, $p=0.010$), and surgery duration (2.9 vs 2.5 h, $p=0.003$). Median ICU stay was 2 days in both groups; however, the distribution was shorter in MIS [IQR 1–2 vs 2–3 days, $p=0.002$]. Postoperative hospital stay was similar [MIS 6.0 (5.0–7.0) vs sternotomy 6.1 (5.7–7.7) days, $p=0.135$]. Minor postoperative complication rates were comparable (17.1% vs 12.5%, $p=0.553$). There were no deaths, reoperations, or 30-day readmissions. Treatment costs were not significantly different (USD 7,605 vs 7,171, $p=0.093$).

CONCLUSION :

MIS for VSD repair offers comparable safety to conventional sternotomy. Although associated with longer operative times, MIS demonstrated shorter ICU utilization despite a similar median stay, suggesting faster recovery. Importantly, treatment costs showed no significant difference between groups. These findings support the adoption of MIS as a safe approach that provides clinical benefits without economic disadvantage.