

# Left atrioventricular valve regurgitation is not a risk in modified single patch technique unless deep ventricular septal defect

**Objective:** This study aimed to evaluate the impact of a modified single patch repair (mSP) for atrioventricular septal defect (AVSD) on competence of left atrioventricular valve (LAVV) in comparison to two patch technique (TP), and identify risk factors incorporating LAVV morphology for significant LAVV regurgitation or LAVV-related reoperation.

**Methods:** This retrospective study included 118 patients with AVSD who underwent intracardiac repair (ICR) between June 1998 and September 2020, including 69 patients (58%) who underwent mSP and 49 patients (42%) underwent two patch repair (TP). Demographics, perioperative data and outcomes were compared between the two groups. Risk factors for significant LAVV regurgitation or LAVV-related reoperation were analyzed using Cox regression analysis. The median follow-up period was 10.4 (4.9-14.4) years. Freedom from significant LAVV regurgitation or LAVV-related reoperation were estimated with Kaplan-Meier method. Propensity score matching was performed for comparison of freedom from significant LAVV regurgitation or LAVV-related reoperation.

**Results:** Weight at ICR did not differ between the two groups (mSP: 5.4 [4.3-6.2] vs. TP: 4.8[3.9-6.6] kg,  $P = 0.339$ ). Preoperative ventricular septal defect (VSD) depth in the mSP group was significantly less than that in the TP group ( $7.3 \pm 2.5$  vs.  $8.9 \pm 2.4$  mm,  $P = 0.001$ ). Distribution of preoperative LAVV regurgitation grade was mostly equivalent between the two groups ( $P = 0.543$ ). Mean aortic cross clamp time was shorter in the mSP group ( $81 \pm 23$  vs.  $98 \pm 27$  minutes,  $P = 0.001$ ). There was one hospital death and one late death. Freedom from significant LAVV regurgitation or LAVV-related reoperation was lower in the mSP group (mSP: 89%, 42%, 17% vs. TP: 86%, 65%, 53% at 1, 5, 10 years,  $P = 0.024$ ). Weight  $< 4.0$ kg at ICR, VSD depth index (VSD depth divided by body surface area)  $> 35$ , and preoperative significant LAVV regurgitation were identified as risk factors for significant LAVV regurgitation or LAVV-related reoperation both in the mSP group and all cohorts, despite only VSD depth index  $> 35$  was not included in the TP group. The propensity score matching extracted 21 matched pairs according to multiple baseline covariates including associating anomalies and anatomical features like VSD depth and grade of LAVV regurgitation. The VSD depth index in matched cohort did not differ between the two groups ( $26.8 \pm 11.6$  vs.  $27.7 \pm 7.9$ ,  $P = 0.769$ ). This analysis found no significant difference in freedom from significant LAVV regurgitation or LAVV-related between the two groups (mSP: 100%, 48%, 38% vs. TP: 95%, 76%, 57% at 1, 5, 10 years,  $P = 0.334$ ).  
**Conclusions:** Incidence of LAVV regurgitation after repair of AVSD was not negligible in both techniques. Unless VSD is not deep, mSP provides similar LAVV competence compared to TP. Appropriate surgical approach should be applied according to variation of anatomies specifically VSD depth.

---

Yasuyuki Kobayashi (1), Yasuhiro Kotani (2), Shingo Kasahara (2), (1) Okayama university hospital, Okayama, Okayama, (2) Okayama University Hospital, Okayama, Okayama