

# Midterm Outcomes Of Minimally Invasive Repair Of Partial Atrioventricular Canal Using Modified Double-orifice Plasty Technique

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## Introduction

Surgical repair of partial atrioventricular septal defect (PAVSD) is frequently complicated by late recurrence of left atrioventricular valve (LAVV) regurgitation or stenosis, contributing to reintervention. We report our experience with a minimally invasive totally endoscopic PAVSD repair incorporating a modified double-orifice LAVV plasty technique intended to improve valve durability.

## Methods

We retrospectively analyzed consecutive PAVSD patients undergoing this approach at our center from January 2023 to August 2025. All procedures were performed via a three-port totally endoscopic approach with femoral cannulation. The repair strategy included LAVV cleft closure and creation of a double-orifice configuration with posterior mitral annuloplasty, patch closure of the ostium primum defect, suture of the tricuspid antero-septal commissure, and tricuspid annuloplasty as indicated.

## Results

Forty-eight patients were included (female, n=31), with a mean age of 31.0 ± 10.4 years (range 11-59) and mean weight of 50.2 ± 13.4 kg (range 35-88). Preoperative mitral regurgitation (MR) was mild in 26 (54.2%), moderate in 6 (12.5%), and severe in 16 (33.3%); tricuspid regurgitation (TR) was mild in 24 (50.0%), moderate in 20 (41.7%), and severe in 4 (8.3%). Mean cardiopulmonary bypass time was 150.3 ± 31.8 minutes (range 98-220) and cross-clamp time was 96.8 ± 26.5 minutes (range 60-179). Postoperative transesophageal echocardiography showed mild-or-less MR in 45 (93.8%) and moderate MR in 3 (6.3%); mild-or-less TR in 37 (77.0%) and moderate TR in 11 (22.9%). No third-degree atrioventricular block, diaphragmatic paralysis, chylothorax, pneumothorax, or femoral stenosis occurred. Mean ICU stay was 1.7 ± 1.0 days (range 1-5) and hospital stay was 12.5 ± 4.2 days (range 7-19). At a median follow-up of 1.3 years (range 0.1-2.5), no patient required reintervention for worsening MR or TR.

## Conclusion

Minimally invasive endoscopic repair for PAVSD using modified double-orifice valve plasty technique is safe and reproducible, demonstrating favorable midterm outcomes.

Table. Chenages in postoperative mitral and tricuspid valve as measured by TTE

|                             | Immediate<br>after surgery | Postop<br>-3 months | Postop<br>-6 months | Postop<br>-12 months |
|-----------------------------|----------------------------|---------------------|---------------------|----------------------|
| Number (n)                  | 48                         | 48                  | 46                  | 45                   |
| Mitral regurgitation        |                            |                     |                     |                      |
| Mild or less                | 45(93.8%)                  | 44(91.7%)           | 42(91.3%)           | 40(88.8%)            |
| Moderate                    | 3(6.3%)                    | 4(8.3%)             | 4(8.7%)             | 5(11.1%)             |
| Severe                      | 0                          | 0                   | 0                   | 0                    |
| Mitral peak gradient (mmHg) |                            |                     |                     |                      |
| Mean                        | 4.6±2.7                    | 4.6±1.9             | 3.8±1.4             | 3.6±0.6              |
| Range                       | 1.8-10.2                   | 1.4-7.8             | 2.6-6.8             | 3.2-4.0              |
| Tricuspid regurgitation     |                            |                     |                     |                      |
| Mild or less                | 37(77.0%)                  | 38(79.2%)           | 40(86.9%)           | 38(84.4%)            |
| Moderate                    | 11(22.9%)                  | 10(20.8%)           | 6 (13.1%)           | 7(15.6%)             |
| Severe                      | 0                          | 0                   | 0                   | 0                    |

