# Beating-Heart Tricuspid Valve Replacement via Right Mini-Thoracotomy: Early Institutional Experience

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## Introduction

Severe tricuspid regurgitation (TR) is increasingly recognized as a progressive disease associated with high mortality, yet isolated tricuspid valve surgery remains infrequent and high-risk. Beating-heart tricuspid valve surgery (TVR) via right mini-thoracotomy offers a minimally invasive option that avoids aortic cross-clamping, maintains coronary perfusion, and may reduce perioperative morbidity.

**Objective**

Describe our early institutional experience with beating-heart isolated tricuspid valve replacement through right mini-thoracotomy.

## Methods

- **Study Design:** Retrospective, single-center study.
- **Study Period:** 2012-2024
- **Population:** 10 patients undergoing beating-heart TVR via right mini-thoracotomy.
- **Analysis:** Continuous variables are presented as median [interquartile range] and categorical variables as frequencies (%).

## Results

**Table 1**. Baseline Characteristics and comorbidities

| | N=10 (%) |
|---|---|
| **Age, years** | 70.5 [40.5 – 75.2] |
| **Sex, female** | 6 (60%) |
| **BMI, kg/m²** | 28.4 +/ |
| **Hypertension** | 8 (80%) |
| **Diabetes** | 1 (10%) |
| **Atrial Fibrillation** | 5 (50%) |
| **CVA/TIA** | 3 (30%) |
| **CKD** | 4 (40%) |
| **COPD** | 2 (20%) |
| **CHF** | 6 (60%) |
| **Liver dysfunction** | 3 (30%) |
| **Prior sternotomy** | 4 (40%) |
| **Ejection fraction, %** | 57.0 [55.0 – 60.0] |
| **Severe RV dilation/dysfunction** | 5 (50%) |
| **NYHA Class** | |
| **I** | 0 |
| **II** | 0 |
| **III** | 8 (80%) |
| **IV** | 2 (20%) |
| **CPB, min** | 82.0 [70.0 – 110.0] |

Patients represented a high-risk cohort, with **40% prior sternotomy**, **50% demonstrating severe RV dysfunction**, and **100% presenting with NYHA class III–IV symptoms.**

**Representative cases**

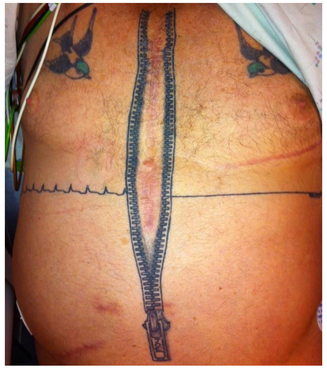

**Figure 1.** Prior sternotomy.

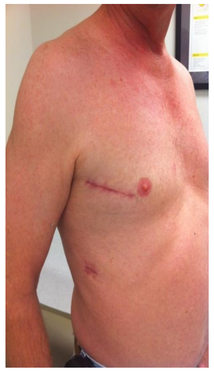

**Figure2**. Post operative right mini-thoracotomy result.

**Postoperative Outcomes**

- Acute Kidney Injury: 1 (10%)
- Pneumonia: 2 (20%)
- Permanent pacemaker: 1 (10%)
- **Stroke: 0**
- **In-hospital mortality: 0**
- **30-day mortality: 0**

- 0% conversion to sternotomy
- 100% freedom from ≥ moderate TR

## Conclusion

**Key Findings**

- No mortality, stroke, reoperation or conversion to sternotomy were observed.
- Residual TR remained mild or less in all patients.
- Freedom from ≥ moderate TR was 100% during follow-up.

Beating-heart tricuspid valve surgery via mini thoracotomy is a viable and favorable option that should be part of every cardiac surgeon's armamentarium for managing severe tricuspid regurgitation.

## Contact information

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