Minimally Invasive Aortic Valve Replacement Fares Better at Improving Postoperative Function: A Propensity-score Matched Asian Study

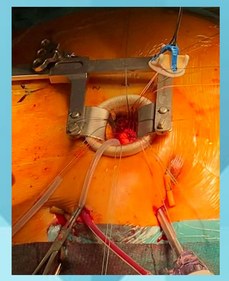
Jai Sule[1], Tay Wei Xuan[2], Titus Joseph[2], Sean Lim[2], Ong Zhi Xian[1], Theo Kofidis[1]
[1]Department of Cardiac, Thoracic and Vascular Surgery, National University Heart Centre, Singapore, [2]Yong Loo Lin School of Medicine, National University of Singapore

NUHS National University Health System

National University Heart Centre Singapore

The International Society for Minimally Invasive Cardiothoracic Surgery

INTRODUCTION



Minimally invasive cardiac surgery (MICS) is increasingly the standard of care for surgical valve replacement.

MICS aortic valve replacement (AVR) positions itself as a durable less invasive approach against transcatheter aortic valve replacement (TAVI).

AIM

To compare **clinical outcomes of MICS versus conventional AVR surgeries** in a mixed Asian population through propensity pair matching.

METHODS

47 propensity matched pairs [MICS vs MS AVR]

January 2009 to December 2018

At National University Heart Centre Singapore

Propensity matching was performed using strict 0.1 calliper for preoperative risk factors estimated via logistic regression. All statistical analysis was performed using R Studio (R Studio Team 2015, Boston, MA, USA).

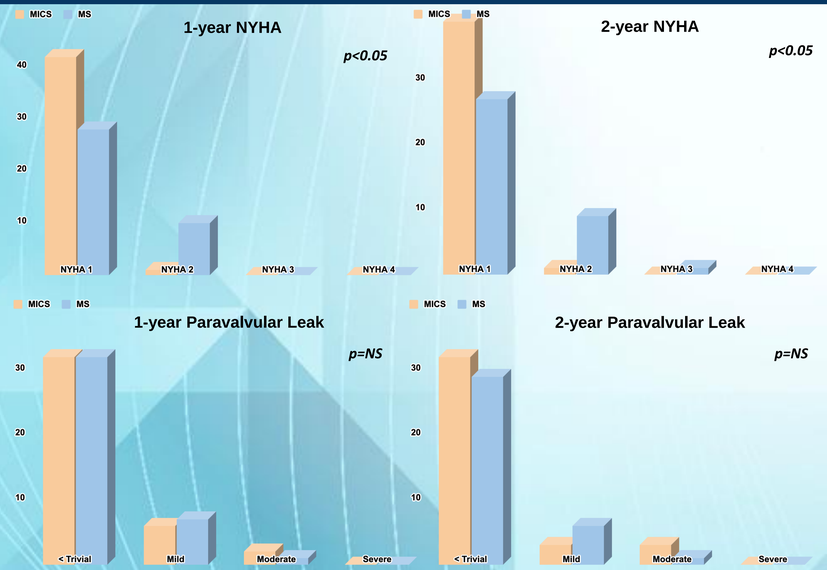
RESULTS

Mean age was 59.1 ± 16.3 years and 58.5 ± 12.3 years for MICS and MS groups respectively. There were no significant differences in demographics between the matched groups. 2 patients in the MICS group underwent conversion to MS.
Aortic cross-clamp times were significantly shorter in the MICS group [72.5 ± 31.7min vs 99.9 ± 41.8min, p=0.001].

Postoperative outcomes of matched pairs

Variables	MICS (N=47)	MS (N=47)	*P*-value
Reoperation for bleeding (%)	3 (6.4%)	3 (6.4%)	NA
Permanent pacemaker insertion (%)	0	1 (2.1%)	NA
New onset atrial fibrillation (%)	5 (10.6%)	6 (12.8%)	0.739
Myocardial infarction (%)	0	0	NA
Neurological complications (%)[1]	3 (6.4%)	2 (4.3%)	1.000
Surgical site infections (%)	1 (2.1%)	2 (4.3%)	1.000
Difference in Ejection fraction (%) pre- and post-operation, mean (sd)	-3.3 ± 12.2	-4.0 ± 8.2	0.344

Among patients with aortic stenosis, MICS AVR conferred significantly better left ventricular remodelling with a drop in left ventricular end-diastolic diameter [-3.9 + 3.4mm vs 0.15 + 12.8, p=0.003].



MICS AVR patients fared significantly better in functional status with significantly more patients achieving NYHA I effort tolerance at 1 year [97.7% MICS vs 73.7% MS, p=0.001], and this persisted at 2 years' follow up [97.5% MICS vs 73.0% MS, p=0.015].

CONCLUSION

MICS AVR showed **comparable 30-day outcomes** and potentially provides **better functional status at follow up**.