Minimally invasive multiple valve surgery through right mini-thoracotomy under direct vision

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Objective

Minimally invasive surgery is a widely accepted surgical treatment for valve disease. However multiple valve surgery is a complex and challenging procedure. The objective of this study was to describe the outcome of minimally invasive multiple valve surgery under direct vision at our institution. The objective of this study was to describe the outcome of minimally invasive multiple valve surgery under direct vision at our institution.

Methods

This was a retrospective review of all minimally invasive multiple valve surgery performed between March 2019 and April 2021.Cardiopulmonary bypass was established by both superior vena cava and femoral vein drainage and femoral artery cannulation through the fourth intercostal space. In patients with an atheromatous aorta, arterial cannula was place at right subclavian artery. Tricuspid surgery was performed on pump beating after aortic declamp.

Results

Eighteen patients underwent minimally invasive multiple valve surgery. The mean age was 74 years (56-81). Eleven patients were male. Triple valve surgery was performed in 5 patients, mitral valve and tricuspid valve surgery in 11 patients, aortic and mitral valve surgery in 3 patients. The aortic clamp time was 149 minutes (128-172) in triple valve surgery. The mean cardiopulmonary bypass time was 265 minutes, and the mean operation time was 366 minutes. The time to initial extubation was within 12 hours in all patients. No unilateral pulmonary edema, bleeding, and stroke were encountered.

	M + T (n = 13)	A + M (n = 10)	A + M + T (n = 6) + Maze (4)
Age (y)	75 (56-82)	72 (57-79)	75 (73-81)
Female	3 (23%)	5 (50%)	4 (67%)
MR/MS	12/1	10/0	6/1
AR/AS	—	6/4	3/3

	M + T (n = 13)	A + M (n = 10)	A + M + T (n = 6) + Maze (4)
AVR	—	10（100%）	6（100%）
MVP/MVR	11/2	7/3	2/4
Ao clamp (min)	112 ± 45 (71-213)	160± 43 (115-267)	156 ± 23 (128-188)
ECC (min)	249 ± 63 (184-401)	262 ± 94 (197-500)	274 ± 26 (250-322)
Ope time (min)	348 ± 54 (274-468)	357 ± 113 (260-640)	379 ± 54 (337-455)

	M + T (n = 13)	A + M (n = 10)	A + M + T (n = 6) + Maze (4)
In-hospital death	0	0	0
Prolonged ventlation (>12hs)	0	0	0
Stroke	0	0	0
Bleeding	0	0	0
Limb ischemia	0	0	0
Pulmonary edema	0	0	0
Conversion to sternotomy	0	1	0



Conclusions

Minimally invasive multiple valve surgery under direct vision can be performed with acceptable early result. This may be a feasible alternative to the standard median sternotomy approach.