Supplementary

Table S1 Canadian Institute of Health Economics Quality Appraisal Checklist for Case Series Studies (Modified)

Domain	Description
1	Was the hypothesis/aim/objective of the study clearly stated?
2	Was the study conducted prospectively?
3	Were the cases collected in more than one centre?
4	Were patients recruited consecutively?
5	Were the characteristics of the patients included in the study described?
6	Were the eligibility criteria (i.e. inclusion and exclusion criteria) for entry into the study clearly stated?
7	Did patients enter the study at a similar point in the disease?
8	Was the intervention of interest clearly described?
9	Were additional interventions (co-interventions) clearly described?
10	Were relevant outcome measures established a priori?
11	Were the relevant outcomes measured using appropriate objective/subjective methods?
12	Were the relevant outcome measures made before and after the intervention?
13	Were the statistical tests used to assess the relevant outcomes appropriate?
14	Was follow-up long enough for important events and outcomes to occur?
15	Were losses to follow-up reported?
16	Did the study provided estimates of random variability in the data analysis of relevant outcomes?
17	Were the adverse events reported?
18	Were the conclusions of the study supported by results?
19	Were both competing interests and sources of support for the study reported?

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Table S2 Individual study quality assessment based on the Canadian Institute of Health Economics Quality Appraisal Checklist

Author, year	Title	Domain number from Canadian Institute of Health Economics Quality Appraisal Checklist																			Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Arghami, 2021	Robotic Mitral Valve Repair: A Decade of Experience With Echocardiographic Follow-up	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	14
Barac, 2022	Sustained results of robotic mitral repair in a lower volume center with extensive minimally invasive mitral repair experience	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Chitwood, 2008	Robotic mitral valve repairs in 300 patients: A single-center experience	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	16
Kesavuori, 2018	Early experience with robotic mitral valve repair with intra-aortic occlusion	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	15
Kim, 2017	Clinical outcomes of robotic mitral valve repair: a single-center experience in Korea	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	14
Klepper, 2022	Robotic mitral valve repair: A single center experience over a 7-year period	1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	14
Liu, 2019	Robotic mitral valve repair: 7-year surgical experience and mid-term follow-up results	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	15
Roach, 2021	Durable Robotic Mitral Repair of Degenerative Primary Regurgitation With Long-Term Follow-Up	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	16
Yoo, 2014	Mitral durability after robotic mitral valve repair: Analysis of 200 consecutive mitral regurgitation repairs	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	15

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Table S3 Valve pathology

Primary author	n	Myxomatous degeneration (%)	Ischemic (%)	Infection (%)	Rheumatic (%)	Functional (%)	Other (%)
Chitwood, 2008	300	100.0	0.0	0.0	0.0	0.0	0.0
Yoo, 2014	200	80.0	0.0	9.0	9.0	0.0	2.0
Kim, 2017	310	84.8	0.0	7.1	6.8	NR	1.3
Kesavuori, 2018	142	100.0	0.0	0.0	0.0	0.0	0.0
Liu, 2019	110	NR	NR	NR	NR	NR	NR
Arghami, 2021	843	100.0	0.0	0.0	0.0	0.0	0.0
Roach, 2021	1,036	87.1	NR	6.9	NR	NR	NR
Barac, 2022	133	90.1	0.0	1.5	0.0	2.3	5.3
Klepper, 2022	226	99.6	0.0	0.0	0.0	0.0	0.4

n, number of patients; NR, not reported.

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Table S4 Procedural details

Primary author	n	Robotic access method	Arterial CPB strategy	Robotic XC method	Cardiopl-egia strategy	Repair details	Concomitant surgery
Chitwood, 2008	300	3 to 4-cm right inframammary incision through the 4th/5th ICS, + three 1-cm robotic access ports	Femoral arterial	Transthoracic aortic crossclamp	AG	Annuloplasty bands with or with-out a leaflet resection to more complex repairs involving chordal transfers, neochor-dal implantations, and a combination of chordal procedures	CryoMaze AF surgery 31 (10.3%), RF AF surgery 22 (7.3%), PFO closure 33 (11%), ASD closure 1 (0.3), MICS CABG 2 (0.7)
Yoo, 2014	200	4-cm minithoracotomy 4th ICS in the mid-axillary line and 3 other port sites	Femoral arterial	Transthoracic aortic crossclamp	AG	Techniques including ring annuloplasty, leaflet resection, neochords, commissuroplasty, sliding annuloplasty, left repair, chordal procedures, Leaflet augmentation, papillary muscle repositioning	Maze 44 (22.0), TV repair 26 (13.0), ASD/PFO 25 (12.5), LA reduction 19 (9.5), LAA ligation 3 (1.5)
Kim, 2017	310	4-cm mini-thoracotomy incision in 4th ICS anterior to anterior axillary line + 3 access ports	Primarily Femoral but also axillary + ascending aorta	Transthoracic aortic crossclamp	AG	Techniques including annuloplasty, leaflet resection, neocords, commissuroplasty, cleft repair, papillary muscle repositioning	Maze procedure 65 (20.9), TV repair 43 (13.8), ASD/PFO closure 34 (11.0), LA reduction 20 (6.5), LAA resection 3 (1.0)
Kesavuori, 2018	142	Camera port was placed near the mammilla (4th ICS), service port was placed laterally same or adjacent ICS, 3 other access ports	Femoral arterial	Primarily endoaortic balloon	AG + RG	Neochord implantation and/or leaflet resection and/or commissuroplasty	AF ablation 35 (24.6), TV repair 6 (4.2), PFO closure 14 (9.9), LAA ligation 32 (22.5), Myxoma excision 1 (0.7)
Liu, 2019	110	2cm incision 4th ICS and 4 other access ports	Femoral arterial	Transthoracic aortic crossclamp	AG	Triangular or quadrangular resection, neochord implantation, anterior leaflet reconstruction, commissurotomy or annuloplasty	PFO/ASD closure 4 (3.6%), LAAL 12 (10.9%)
Arghami, 2021	843	2- to 4-cm working port in the 4th ICS and 3 additional robotic 8-mm ports	Femoral arterial	Transthoracic aortic crossclamp	AG	Partial annuloplasty + either leaflet resection, neochordae, commissuroplasty, cleft closure and/or leaflet plication	Cryomaze 52 (6.1%), PFO 148 (17.5%), LAAL 44 (5.2%), TV repair 8 (0.9%)
Roach, 2021	1036	5- to 8-cm right thoracotomy and other access ports	Femoral arterial	Transthoracic aortic crossclamp (5 cases used endoclamp early in series)	AG	Flexible band and leaflet resection, neochords, chordal transfer, commissural suture and/or edge-to-edge repair	LAA closure 639 (61.7%), Cryomaze 211 (20.4%), PFO 159 (15.4%), TV repair 64 (6.2%)
Barac, 2022	133	4-cm minithoracotomy incision in 4th ICS + other robotic port access	Ascending aorta	Transthoracic aortic crossclamp or endoaortic occlusion	AG	Partial/complete annuloplasty, leaflet resection, chordal replacement and Alfieri stitch	Maze 18 (14%), TV operation 6 (5%)
Klepper, 2022	226	4-cm mini-thoracotomy incision in 4th ICS + four other robotic ports	Femoral arterial	Transthoracic aortic crossclamp	AG	Complete or partial band, leaflet resection, chordae transfer, neochords, cleft repair and/or commissuroplasty	TV repair 4 (1.8%), AF ablation 6 (2.7%), LAAL 20 (8.8%), ASD 2 (0.9%), Myxoma 2 (0.9%)

N, number of patients; CPB, cardiopulmonary bypass; XC, cross clamp; ICS, inter-costal space; AG, antegrade; RG, retrograde; AF, atrial fibrillation; RF, radiofrequency; PFO, patent foramen ovale; ASD, atrial septal defect; MICS, minimally invasive cardiac surgery; CABG, coronary artery bypass grafting; TV, tricuspid valve; LA, left atrium; LAA, left atrial appendage.

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