

Gender-Based Comparative Analysis of Outcomes Following Minimally Invasive Aortic Valve Replacement : A 15-Year Study

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BACKGROUND

Minimally invasive aortic valve replacement (mini-AVR) is increasingly favoured for its reduced trauma and faster recovery. However, data on gender-specific outcomes remain limited. Differences in baseline characteristics and surgical risk between males and females may influence both perioperative complications and long-term survival. This study aims to address these gaps by analysing gender-based outcomes in a large single-centre mini-AVR cohort.

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OBJECTIVE

To evaluate and compare perioperative and long-term outcomes between males and females undergoing mini-AVR over 15 years and identify gender-specific predictors of long-term mortality.

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METHODS

Design

Retrospective cohort of **472 minimally invasive AVR** patients (**188 females, 284 males**).

Time Frame

2007 – 2022

Matching

155 male-female propensity score matched **pairs** on baseline characteristics

Analysis

Kaplan-Meier survival curves and **Cox regression** to identify predictors of long-term mortality.

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RESULTS

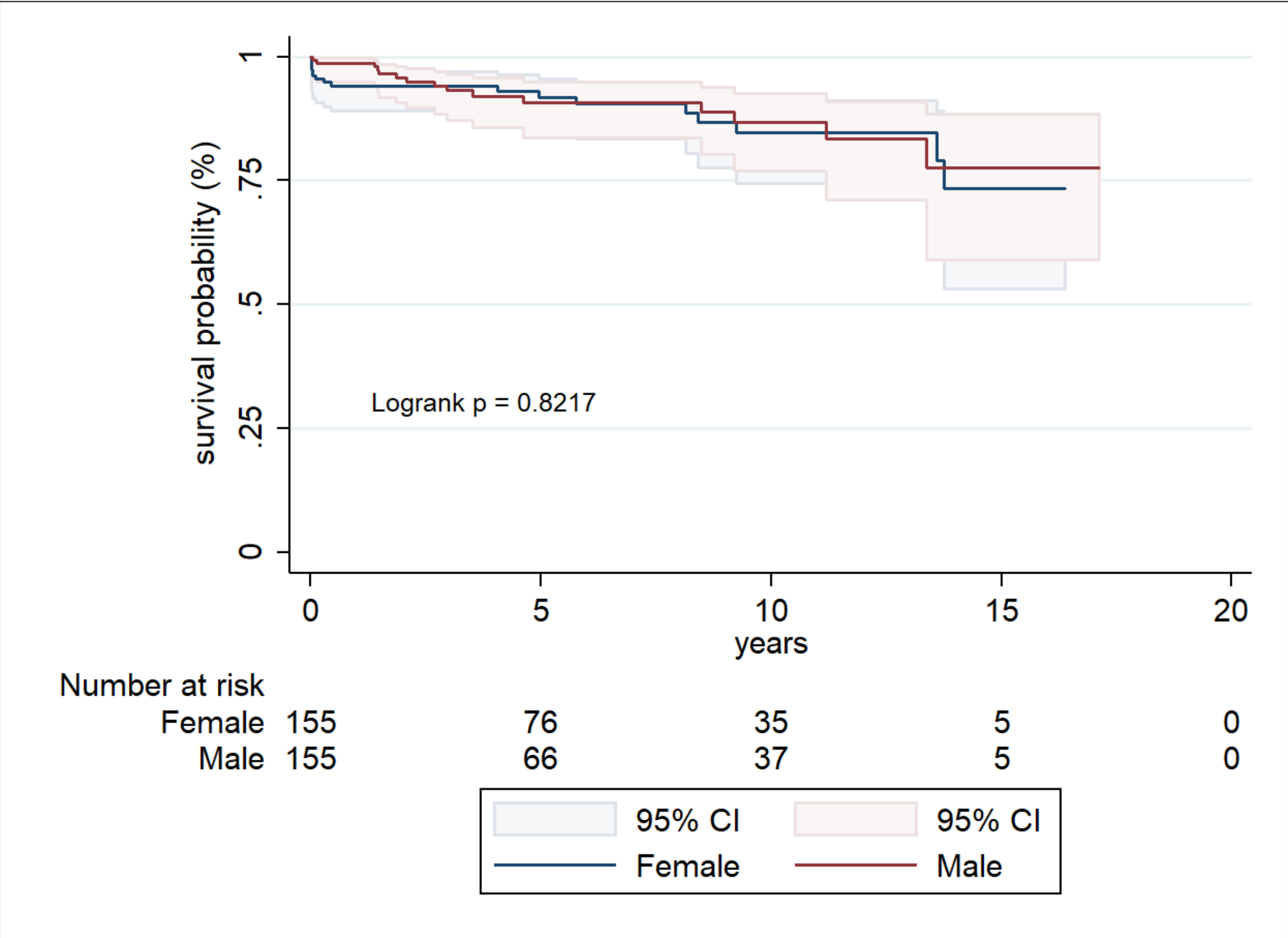
Intraoperative Data

Outcome	Unmatched (n = 472)			Matched (n = 258)		
	Male (n = 284)	Female (n = 188)	P value	Male (n = 155)	Female (n = 155)	P value
Mini-sternotomy	218 (76.8)	144 (76.6)	.967	117 (75.5)	118 (76.1)	.894
Mini-thoracotomy	66 (23.2)	44 (23.4)	.967	38 (24.5)	37 (23.9)	.894
Converted to full approach	5 (1.8)	12 (6.4)	.008	3 (1.9)	10 (6.5)	.047
Bypass Time (min)	94.7 ± 35.2	92.4 ± 50.6	.570	92.5 ± 27.5	94.1 ± 54.3	.739
Cross clamp time (min)	68.2 ± 25.5	61.0 ± 21.0	.001	67.7 ± 21.3	61.5 ± 22.1	.013
Valve used						
Mechanical	31 (10.9)	14 (7.4)	.209	10 (6.5)	14 (9.0)	.396
Biological	253 (89.1)	174 (92.6)		145 (93.5)	141 (91)	

In-Hospital Outcomes

Outcome	Unmatched (n = 472)			Matched (n = 258)		
	Male (n = 284)	Female (n = 188)	P value	Male (n = 155)	Female (n = 155)	P value
AF	69 (24.3)	51 (27.1)	.489	39 (25.2)	38 (24.5)	.895
Reoperation	10 (3.5)	12 (6.4)	.149	2 (1.3)	11 (7.1)	.011
Tracheostomy	2 (0.7)	0 (0)	.249	2 (1.3)	0 (0)	.156
TIA/CVA	3 (1.1)	1 (0.5)	.543	2 (1.3)	1 (0.6)	.562
Superficial wound infection	2 (0.7)	1 (0.5)	.818	1 (0.6)	1 (0.6)	1.000
RRT	3 (1.1)	5 (2.7)	.187	2 (1.3)	5 (3.2)	.251
Pleural effusion requiring drainage	13 (4.6)	8 (4.3)	.868	7 (4.5)	5 (3.2)	.556
Pericardial effusion requiring drainage	4 (1.4)	2 (1.1)	.744	1 (0.6)	1 (0.6)	1.000
Postoperative stay (days)	8.9 ± 6.4	9.4 ± 7.4	.404	9.12 ± 6.7	9.29 ± 7.7	.833
In-hospital mortality	1 (0.4)	5 (2.7)	.028	1 (0.6)	5 (3.2)	.099

Long-Term



Previous cardiac surgery independently predicted mortality (HR 2.658; 95% CI 1.016 – 6.952, p = 0.046)

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Conclusion

Females undergoing mini-AVR faced higher perioperative risks, including increased rates of in-hospital mortality, conversion to full sternotomy and reoperation. For females, the impact of previous cardiac surgery emphasizes the importance of meticulous surgical planning and long-term follow-up care.