Dual or single antiplatelet therapy after coronary artery bypass grafting in patients with acute coronary syndrome: The TACSI trial

Anders Jeppsson, Ulrik Sartipy, TACSI Investigators

Background

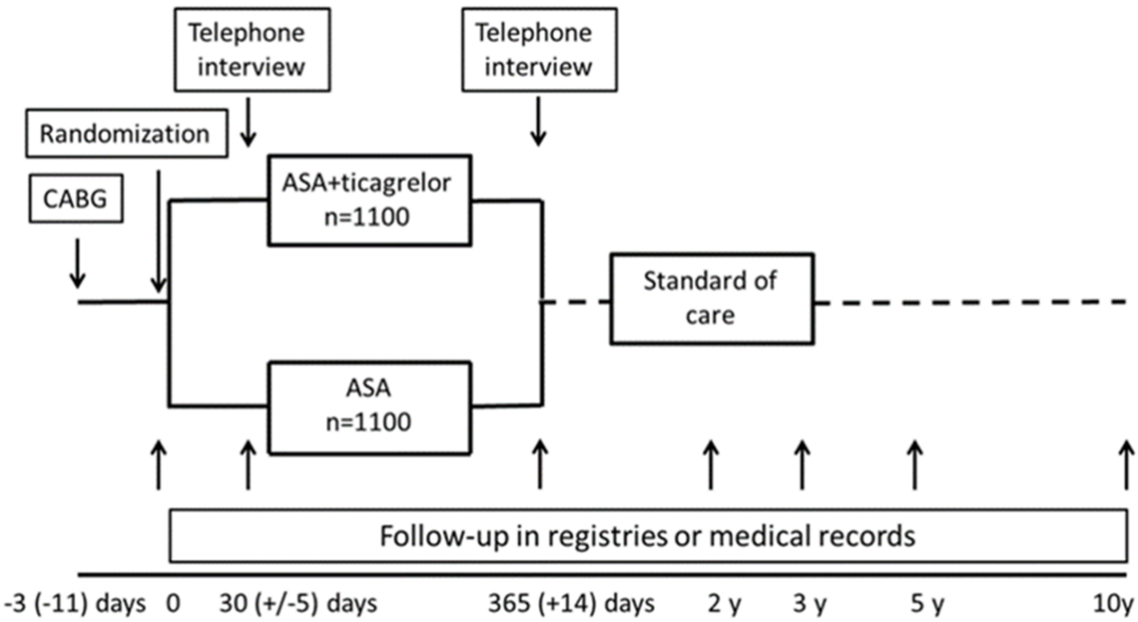
Current guidelines recommend dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor over single antiplatelet therapy after CABG for patients with acute coronary syndrome, but the evidence behind the recommendation is limited. Larger randomized trials with clinically relevant endpoints in CABG patients are lacking.

Methods

An investigator-initiated, open-label, registry-based randomized clinical trial was performed at all the 22 cardiothoracic surgery centers in Sweden, Denmark, Norway, Finland and Iceland. Patients with acute coronary syndrome undergoing CABG were randomly assigned to a strategy of treatment with either 12 months treatment with DAPT (ticagrelor + aspirin) or aspirin only. The primary endpoint was a composite of all-cause death, hospitalization for myocardial infarction or stroke, or repeat revascularization evaluated in a time-to-event analysis at one year. Primary safety endpoint was major bleeding. A key secondary endpoint was net adverse clinical events (NACE), defined as the primary composite endpoint and major bleeding.

Results

The follow-up for the primary endpoint was completed for all patients in February 2025. The primary results of the study will be presented at SATS. ClinicalTrials.gov number NCT03560310.


Telephone interview
Telephone interview
Randomization
CABG
ASA+ticagrelor n=1100
ASA n=1100
Standard of care
Follow-up in registries or medical records
-3 (-11) days
0
30 (+/-5) days
365 (+14) days
2 y
3 y
5 y
10y

Adherence to secondary prevention medication after coronary artery bypass grafting and long-term outcomes

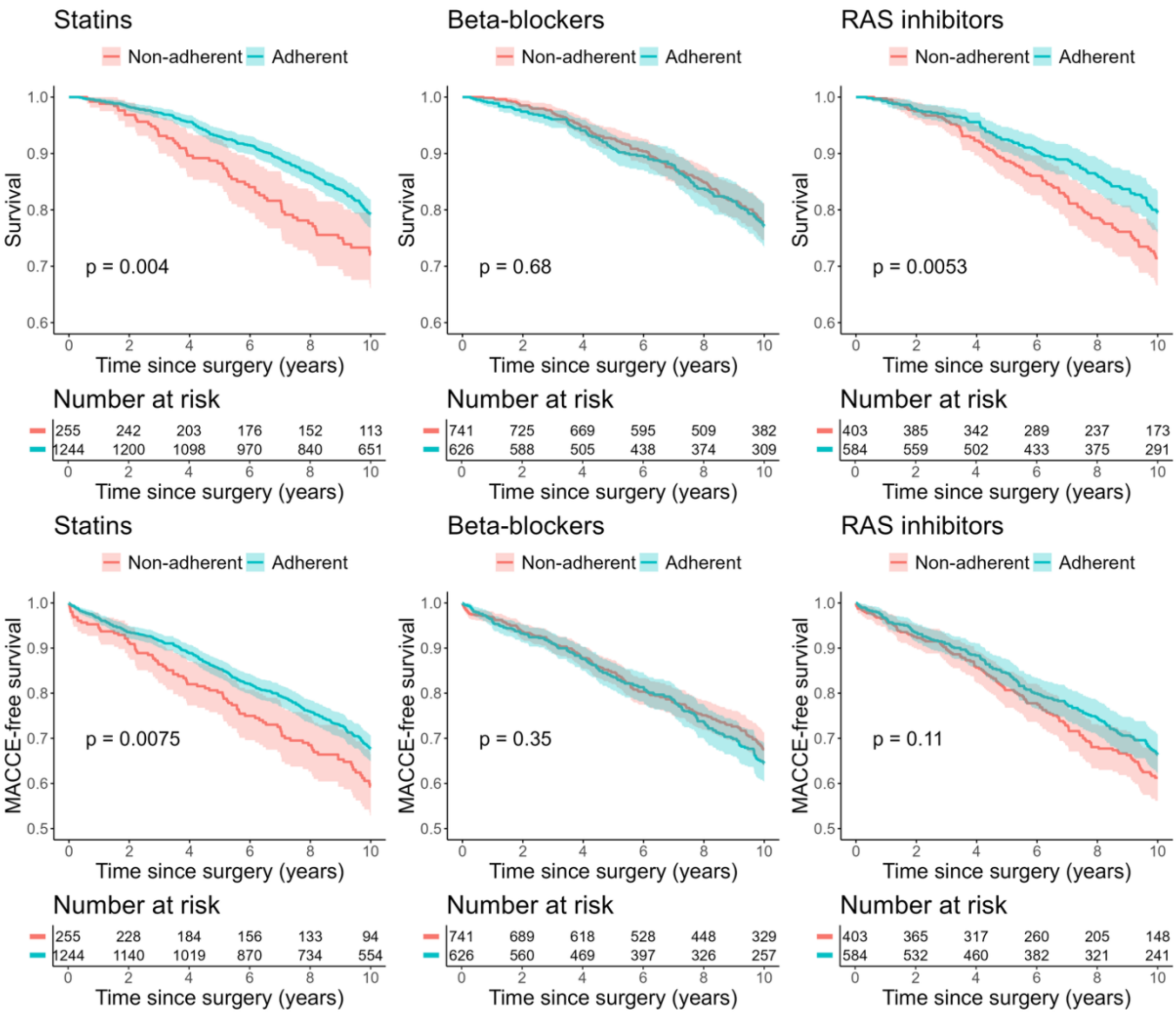
Bodvar Pall Asgeirsson[1], Leon Arnar Heitmann[1], Anders Jeppsson[2,3], Karl Andersen[1,4], Tomas Gudbjartsson[1,5]
[1] Faculty of Medicine, University of Iceland, [2] Department of Cardiothoracic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden, [3] Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, [4] Department of Cardiology, Landspitali University Hospital, Reykjavik, Iceland, [5] Department of Cardiothoracic Surgery, Landspitali University Hospital, Reykjavik, Iceland

Introduction: Secondary prevention medications such as statins, beta-blockers and renin-angiotensin system (RAS) inhibitors are recommended following coronary artery bypass grafting (CABG). We assessed adherence to these medications after CABG and their association with long-term mortality and major adverse cardiovascular and cerebrovascular events (MACCE).

Material and methods: This retrospective study included patients who underwent CABG and survived >90 days, from 2007-2022 at Landspitali University Hospital, Iceland. Data were retrieved from medical records and a nationwide prescription registry. Patients dispensed medication ≥80% of the time during five years post-CABG were considered adherent. Kaplan-Meier method and multivariable Cox regression assessed associations between adherence and mortality and MACCE.

Results: 1544 patients were included. Adherence rates were 83,0% for statins, 45,8% for beta-blockers, and 59,2% for RAS inhibitors. Adherence to statins was associated with reduced mortality (aHR:0,69; CI:0,53-0,90), but not beta-blockers (aHR:0,93; CI:0,74-1,17) or RAS inhibitors (aHR:0,80; CI:0,60-1,05). Statin adherence was also associated with lower MACCE incidence (aHR:0,72; CI:0,57-0,91), while no significant association was observed for beta-blockers (aHR:1,03; CI:0,85-1,24) or RAS inhibitors (aHR:1,00; CI:0,80-1,26). Subgroup analyses showed greater benefit of statins in patients without prior MI. Beta-blockers were associated with lower MACCE in patients with reduced LVEF, while RAS inhibitors were associated with higher mortality and MACCE in patients with heart failure.

Conclusions: Long-term adherence to statins is associated with better outcomes after CABG. In contrast, adherence to beta-blockers and RAS inhibitors was low and showed benefits only in a subset of patients. These results highlight the importance of adherence and personalized therapy after CABG.



Statins
Non-adherent
Adherent
Survival
p = 0.004
Time since surgery (years)
Number at risk
255 242 203 176 152 113
1244 1200 1098 970 840 651
Beta-blockers
p = 0.68
741 725 669 595 509 382
626 588 505 438 374 309
RAS inhibitors
p = 0.0053
403 385 342 289 237 173
584 559 502 433 375 291
MACCE-free survival
Statins
p = 0.0075
255 228 184 156 133 94
1244 1140 1019 870 734 554
Beta-blockers
p = 0.35
741 689 618 528 448 329
626 560 469 397 326 257
RAS inhibitors
p = 0.11
403 365 317 260 205 148
584 532 460 382 321 241

Secondary prevention goal accomplishments one year after coronary artery bypass grafting: A nationwide study from SWEDEHEART

Elin Sandin, Anders Jeppsson, Emma Hansson, Margret Leosdottir, Maria Bäck, Andreas Martinsson

Background:

Outcomes after CABG have improved, but significant risks of long-term complications remains, underscoring the importance of secondary prevention. We assessed adherence to guidelines regarding key medications and lifestyle factors in a large nationwide cohort of MI patients who had undergone CABG.

Methods:

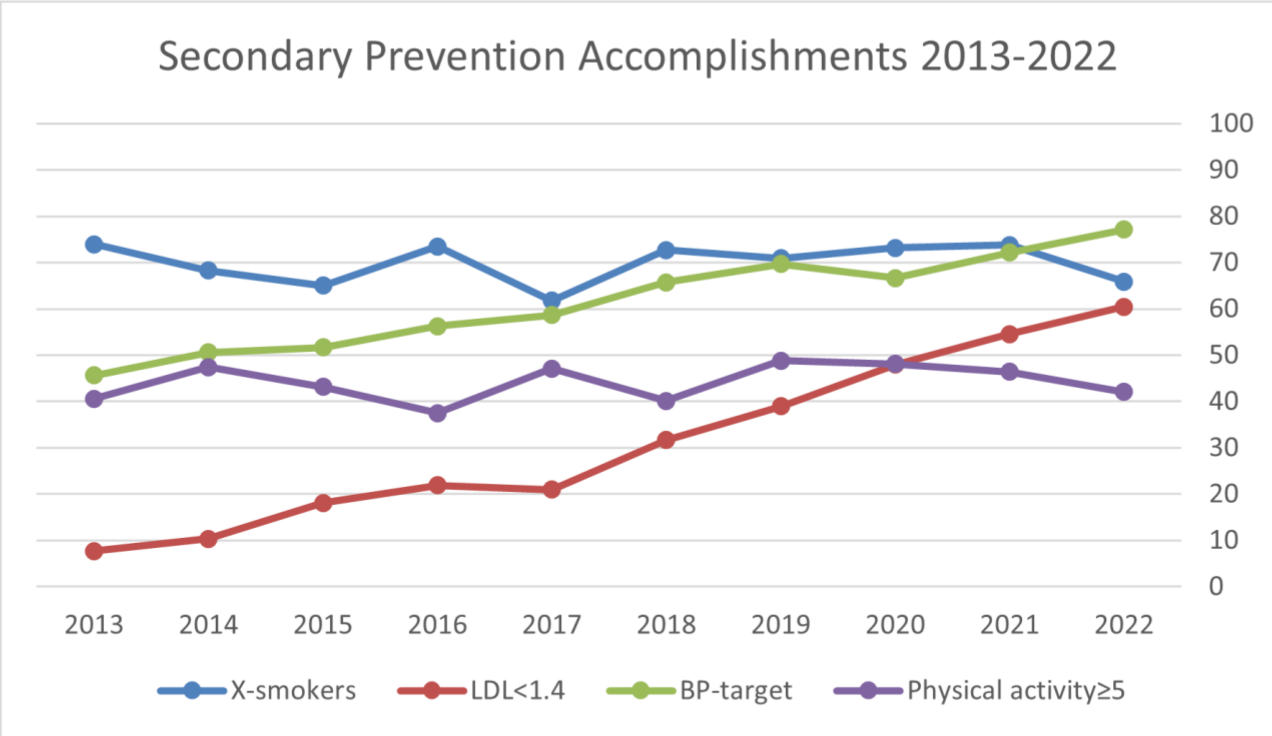
Patients that underwent CABG after MI 2013-2022 were identified in the nationwide registry for cardiac disease, SWEDEHEART. Treatment with guideline-directed secondary prevention medications (lipid lowering drugs, RAAS-inhibitors and antithrombotics) and lifestyle recommendations (smoking cessation and sufficient physical activity) were assessed at 12 months after surgery. The proportions of patients reaching goals of LDL-cholesterol (<1.4 mmol/L), systolic blood pressure (<130 or <140 depending on age), smoking and physical activity were calculated.

Results:

5132 patients (82.5% men) were included in the analysis. One year after CABG, 95.9% were treated with lipid lowering drugs, 77.4% with RAAS-inhibitors, and 98.9% with antiplatelets and/or anticoagulants. 44.2% were physically active at least five times a week and 70.1% of patients smoking at the time of CABG had stopped. The goal accomplishments for LDL-cholesterol and blood pressure were reached in 33.5% and 62.8% respectively of the patients, with significant improvements during the later years (60.5% and 77.1% respectively in patients operated 2022).

Conclusions :

Secondary prevention medication usage in patients undergoing CABG after a myocardial infarction and followed is satisfactory. However, more than one third of the patients still do not reach guideline-defined goals for LDL cholesterol, physical activity and smoking cessation.



Secondary Prevention Accomplishments 2013-2022
100
90
80
70
60
50
40
30
20
10
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
X-smokers
LDL<1.4
BP-target
Physical activity≥5

Wound analgesia and full sternotomy; a randomized trial

Ari Mennander[1,2], Antti Kalli[1], Julia Vistbacka[2], Eeva Moilanen[2], Kati Järvelä[1,2]
[1] Tampere University Hospital, Heart Hospital, [2] Tampere University

Objectives: Lung function after full sternotomy determines early patient recovery. We studied whether additional wound analgesia using parasternal intercostal plane block (PIP) before surgical aortic valve replacement via full sternotomy impacts lung function and lung filtration capacity.

Methods: Altogether, 74 consecutive patients undergoing surgical aortic valve replacement received either or not additional PIP. Pre- and postoperative lung function tests were compared among the patients. Venous and arterial blood samples were simultaneously procured to estimate lung filtration (venous/arterial) of the inflammatory factors chemerin, chitinase-3-like protein 1 (YKL-40), resistin and interleukin-6 (IL6) before surgery (T1), during surgery (T2), and after surgery (T3) in 30 age- and sex-adjusted patients.

Results: Patient characteristics and preoperative lung functions did not differ between the groups, but patients with PIP were older as compared to those without (66.7 [10.7] vs 60.2 [13.4], years, respectively, $p<0.04$). Forced expiratory volume (FEV), forced volume capacity (FVC), and relative FVC changes decreased less in patients treated with wound analgesia as compared to those without ($P = 0.024$, $P= 0.042$ and $P = 0.042$). Total oxycodone consumption ($P = 0.634$), YKL-40 and resistin did not differ between the groups. Arterial chemerin decreased and venous/arterial IL6 ratio increased in patients with PIP as compared to those without ($P = 0.024$ versus $P = 0.332$, respectfully).

Conclusions: PIP before aortic valve surgery via full sternotomy ameliorates postoperative respiratory function and venous/arterial IL6 ratio. PIP enhances early patient recovery after full sternotomy.

Early ischemic stroke risk in patients with new-onset postoperative atrial fibrillation after cardiac surgery

Issam Alghaeb[1], Anders Jeppsson[1], Mary Rezk[1]
[1] Department of Cardiothoracic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden

Background

New-onset postoperative atrial fibrillation (POAF) is common following cardiac surgery. POAF is associated with long-term risk for stroke, however, its role in early stroke risk remains less clear. We aimed to evaluate whether POAF is independently associated with an increased risk of ischemic stroke occurring during the index hospitalization for cardiac surgery.

Methods

A retrospective observational cohort study including 13772 patients who underwent coronary artery bypass grafting, valve surgery, or both, at Sahlgrenska University Hospital, Gothenburg, Sweden from 2007 to 2025. All patients were treated with low molecular weight heparin in the early postoperative period. The primary outcome was ischemic stroke during the index hospitalization. Information on type and timing of stroke, and POAF onset were obtained from electronic patient records. The association between POAF and early ischemic stroke was analyzed using logistic regression models adjusted for age, sex, hypertension, diabetes, and prior stroke.

Results

A total of 4336 patients (31.5%) developed POAF. Ischemic stroke during index hospitalization occurred in 73 (1.7%) and 115 (1.2%) patients with and without POAF, respectively (p=0.030). Most strokes (56.8%) occurred before POAF debut. POAF was not associated with increased ischemic stroke risk during the index hospitalization, neither overall (adjusted odds ratio (aOR) 1.28 [95% CI: 0.94-1.76], p=0.12) or when strokes occurring before POAF were excluded (aOR 0.55 [95% CI: 0.36-0.81], p=0.003).

Conclusions

POAF is not associated with increased risk of ischemic stroke during the index hospitalization for cardiac surgery.

Temporal trends in open thoracic aortic surgery in Sweden over 20 years: A population-based nationwide study

Jenny Backes[1,2], Nadia Sandström[1,2], Maja Eriksson Östman[1,3], Daniel Robert Smith[4], Anders Jeppson[5,6], Anna Jonsson Holmdahl[7,8], Örjan Friberg[1,2]

[1] 1) School of Medical Sciences, Faculty of Medicine and Health, Örebro University, Örebro, Sweden, [2] 2) Department of Cardiothoracic and Vascular Surgery, Örebro University Hospital, Örebro, Sweden, [3] 3) Department of Cardiology, Örebro University Hospital, Örebro, Sweden, [4] 4) Clinical Epidemiology and Biostatistics, School of Medical Sciences, Faculty of Medicine and Health, Örebro University, Örebro, Sweden, [5] 5) Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden, [6] 6) Department of Cardiothoracic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden, [7] 7) Department of Public Health and Clinical Medicine, Umeå University, Umeå, Sweden, [8] 8) Department of Cardiothoracic Surgery, Umeå University Hospital, Umeå, Sweden

The authors have chosen not to publish the abstract

The role of age on the extent of Acute Type A Aortic Dissection: Results from The Nordic Consortium for Acute Type A Aortic Dissection-2 (NORCAAD-2)

Anna Jonsson Holmdahl[1], Mattias Karlsson[1], Oscar Ahlstrand[1], Mattias Brunström[1], Emma Hansson[2], Farkas Vanky[3], Anders Wickbom[4], Igor Zindovic[5], Christian Olsson[6]

[1] Department of Public Health and Clinical Medicine, Umeå University, Umeå, Sweden , [2] Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska Academy, Gothenburg University, Sweden and Department of Cardiothoracic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden, [3] Department of Thoracic and Vascular Surgery, Department of Health, Medicine and Caring Sciences, Unit of Cardiovascular Medicine, Linköping University, Linköping, Sweden, [4] Department of Cardiothoracic and Vascular Surgery, Örebro University Hospital, Örebro, Sweden, [5] Department of Cardiothoracic Surgery, Skåne University Hospital, Lund University, Lund, Sweden, [6] Department of Thoracic and Cardiovascular Surgery, Karolinska University Hospital, Stockholm, Sweden

Background: The impact of age on the extent and clinical severity of acute type A aortic dissection (ATAAD) remains incompletely understood. This study investigated whether younger patients presented with more extensive dissection, increased risk of malperfusion and for complex surgical intervention.

Methods: We analyzed 1,156 patients who underwent surgery for ATAAD at a Swedish center and were enrolled in the Nordic Consortium for Acute Type A Aortic Dissection-2 (NORCAAD-2) registry between 2014-2024. Patients were stratified into four age groups by quartiles. Primary outcomes included DeBakey type 1 acute aortic dissection (DBT1-AAD), malperfusion (Penn Class B), and extensive surgery.

Results: The youngest patients (<56 years) had a higher frequency of DBT1-AAD (84% vs. 73%) and extensive surgery (46% vs. 23%) compared to the oldest patients (>73 years) (p<0.01). Aortic root resections and aortic valve replacements were more frequent in the youngest vs. the oldest group (20% vs. 8% and 34% vs. 19%, p<0.001). In the youngest group, all root resections were for dissection (70%) and/or dilatation (55%). After adjusting for known ATAAD risk factors, the youngest patients had about twice the odds of DBT1-AAD (aOR 1.93; 95% CI: 1.23-3.02) and extensive surgery (aOR 2.47; 95% CI 1.63-3.73) compared to the oldest patients. No association between age and malperfusion was found (p >0.05).

Conclusions: Younger age was independently associated with more extensive aortic dissections and complex surgical interventions in ATAAD. Further research is needed to explore the underlying mechanism of this association.

Tables

Table 1. Characteristics and clinical presentation.

Characteristics and clinical presentation	<56 years	56-65 years	66-73 years	>73 years	p
Total patients, n (%)	286 (25)	308 (27)	295 (26)	267 (23)	
Demographics					
Gender (male), n (%)	228 (80) +	221 (72)	192 (65)	149 (56) -	<.001
Weight, kg, mean (SD)	91 (19)	87 (18)	83 (16)	76 (15)	<.001*
Height, cm, mean (SD)	179 (9)	177 (9)	175 (9)	171 (9)	<.001*
Etiology and history, n (%)					
Prior ascending aortic aneurysm	29 (10)	35 (11)	49 (17)	46 (17)	0.117
CTD	19 (7) +	3 (1)	2 (1) -	1 (0.4) -	<.001
HTAD	45 (16) +	36 (12)	22 (8)	12 (5) -	<.001
Hypertension	108 (38) -	178 (58)	191 (65) +	186 (70) +	<.001
Diabetes	7 (2)	8 (3)	19 (6)	13 (5)	0.129
Current or previous smoker	107 (37) -	147 (48)	147 (50) +	102 (38) -	0.045
Prior open cardiac surgery	5 (2)	7 (2)	15 (5) +	5 (2)	
Aortic valve morphology, n (%)					
Tricuspid	248 (87) -	287 (93) +	260 (88)	249 (93)	0.013
Bicuspid	25 (9) +	9 (3)	11 (4)	5 (2) -	<.001
Prosthesis	4 (1)	8 (3)	11 (4)	5 (2)	0.281
Aortic valve status, n (%)					
Stenosis (>3 m/s)	2 (1)	3 (1)	5 (2)	9 (3)	0.061
Regurgitation	187 (65) +	177 (58)	172 (58)	158 (59) -	0.018
Characteristics at debute, n (%)					
Tamponade or shock	76 (27) -	100 (33)	92 (31)	124 (46) +	<.001
CPR performed	7 (2)	16 (5)	15 (5)	18 (7)	0.125
Unconsiousness	16 (6)	38 (12)	31 (11)	28 (11)	0.217
Malperfusion syndrome , n (%)	124 (43)	161 (52)	155 (53)	129 (48)	0.057
Cerebral	42 (15)	60 (20)	67 (23)	60 (23)	
Coronary	41 (14)	53 (17)	39 (13)	37 (14)	
Extremities	53 (19)	67 (22)	64 (22)	46 (17)	
Renal	30 (11)	35 (11)	30 (10)	19 (7)	
Spinal	3 (1)	15 (5)	5 (2)	6 (2)	
Visceral	18 (6)	17 (6)	15 (5)	14 (5)	

CTD = Connective tissue disease, HTAD = hereditary thoracic aortic disease, CPR = cardiopulmonary resuscitation.

p = chi2 with adjusted residuals. +adjusted residual > 1.96, − adjusted residual < -1.96.

** p=chi2 for trend - linear by linear association.*

Table 2. In-hospital management and mortality.

In-hospital management and mortality, n (%)	**<56 years**	**56-65 years**	**66-73 years**	**>73 years**	**p**
Total patients	286 (25)	308 (27)	295 (26)	267 (23)	
Primary tear location					
Root	56 (20)$^{+}$	26 (8)	34 (12)$^{-}$	22 (8)$^{-}$	<.001
Ascending	189 (66)	201 (65)	190 (65)	186 (70)	0.533
Arch	27 (9)$^{-}$	65 (21)	57 (19)	54 (20)	<.001
Descending	11 (4)	10 (3)	9 (3)	5 (2)	0.594
Part(s) of aorta resected					
Root	109 (38)$^{+}$	59 (19)	51 (17)$^{-}$	35 (13)$^{-}$	<.001
Ascending	288 (97)	293 (95)	282 (96)	262 (98)	0.261
Arch undersurface	57 (20)	82 (27)	83 (28)	65 (24)	0.104
Arch proper	20 (7)	19 (6)	17 (6)	6 (2)	0.069
Indication for root procedure, n (% of patients with root procedure)					
Dilatation	61 (55)$^{+}$	26 (44)	16 (31)$^{-}$	10 (26)$^{-}$	0.005
Destructed by dissection	73 (70)	44 (75)	41 (80)	29 (82)	0.154
Prophylactic	12 (11)	2 (3)	3 (6)	1 (3)	0.184
Aortic valve management					
Aortic valve replacement	98 (34)$^{+}$	56 (18)$^{-}$	54 (18)	50 (19)	<.001
Aortic valve resuspension	86 (30)$^{-}$	131 (43)	120 (41)	107 (40)	<.009
Aortic valve repair	2 (1)	2 (1)	1 (0.3)	3 (1)	0.737
None aortic valve procedure	96 (34)	112 (36)	112 (38)	102 (38)	0.601
Intraoperative mortality	7 (2)	9 (3)	16 (5)	10 (4)	0.298

p = chi2 with adjusted residuals. $^{+}$adjusted residual > 1.96, $^{-}$ adjusted residual < -1.96.

Table 3. Postoperative complications.

Postoperative, n (%)	**<56 years**	**56-65 years**	**66-73 years**	**>73 years**	**p**
Total patients	279 (25)	299 (27)	279 (25)	257 (23)	
Mortality					
30-day mortality	16 (6)$^{-}$	24 (8)$^{-}$	39 (14)$^{+}$	44 (17)$^{+}$	<.001
Peripheral vascular procedure	2 (1)$^{-}$	13 (4)	12 (4)	8 (3)	0.045
Postoperative complications					
Renal failure or loss*	54 (19)$^{-}$	93 (31)	103 (37)$^{+}$	84 (33)	<.001
Neurological damage	49 (18)$^{-}$	81 (27)	72 (26)	65 (25)	0.035
Cardiac complication	29 (10)	44 (15)	45 (16)	31 (12)	0.177
Respiratory complication	42 (15)$^{-}$	66 (22)	88 (32)$^{+}$	75 (29)$^{+}$	<.001
MSOF	22 (8)$^{-}$	43 (14)	47 (17)	43 (17)	0.007
Reoperation for bleeding (<24 h)	25 (9)	39 (13)	45 (16)$^{+}$	23 (9)	0.021

MSOF = multisystem organ failure.

**According to the RIFLE Criteria for renal failure or loss.*

p = chi2 with adjusted residuals. $^{+}$adjusted residual > 1.96, $^{-}$ adjusted residual < -1.96.

Figures

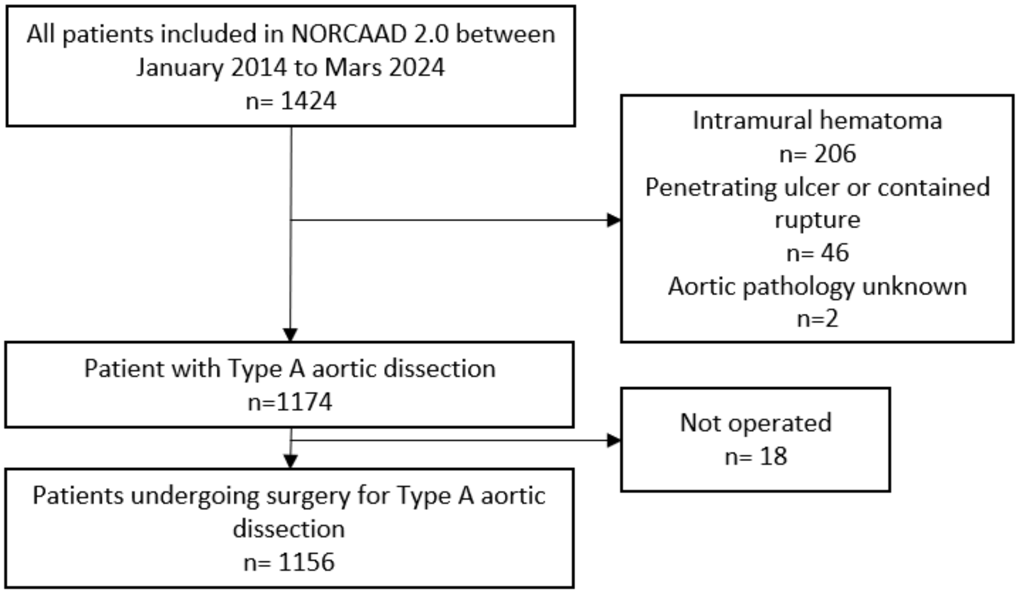


Figure 1. Flowchart of the patient selection for the study cohort.

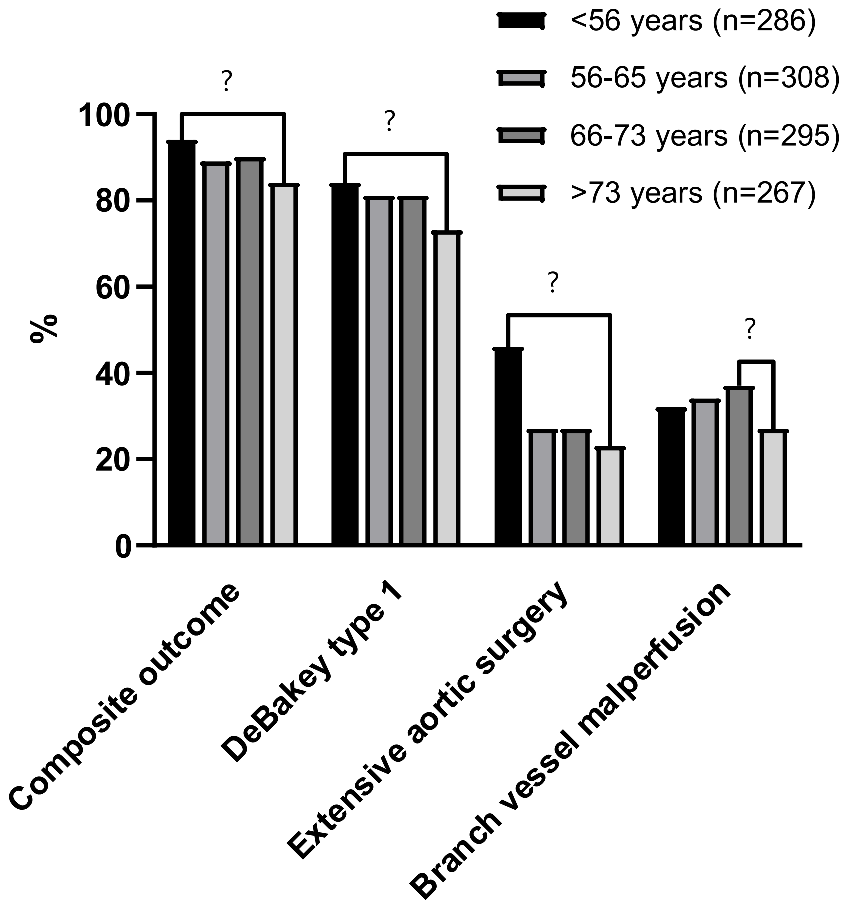


*Figure 2. Primary outcomes separately and as a composite outcome across all age groups. *= p <0.05. Extensive aortic surgery = surgery of the ascending aorta and the aortic root and/or aortic valve replacement and/or advanced arch procedures.*

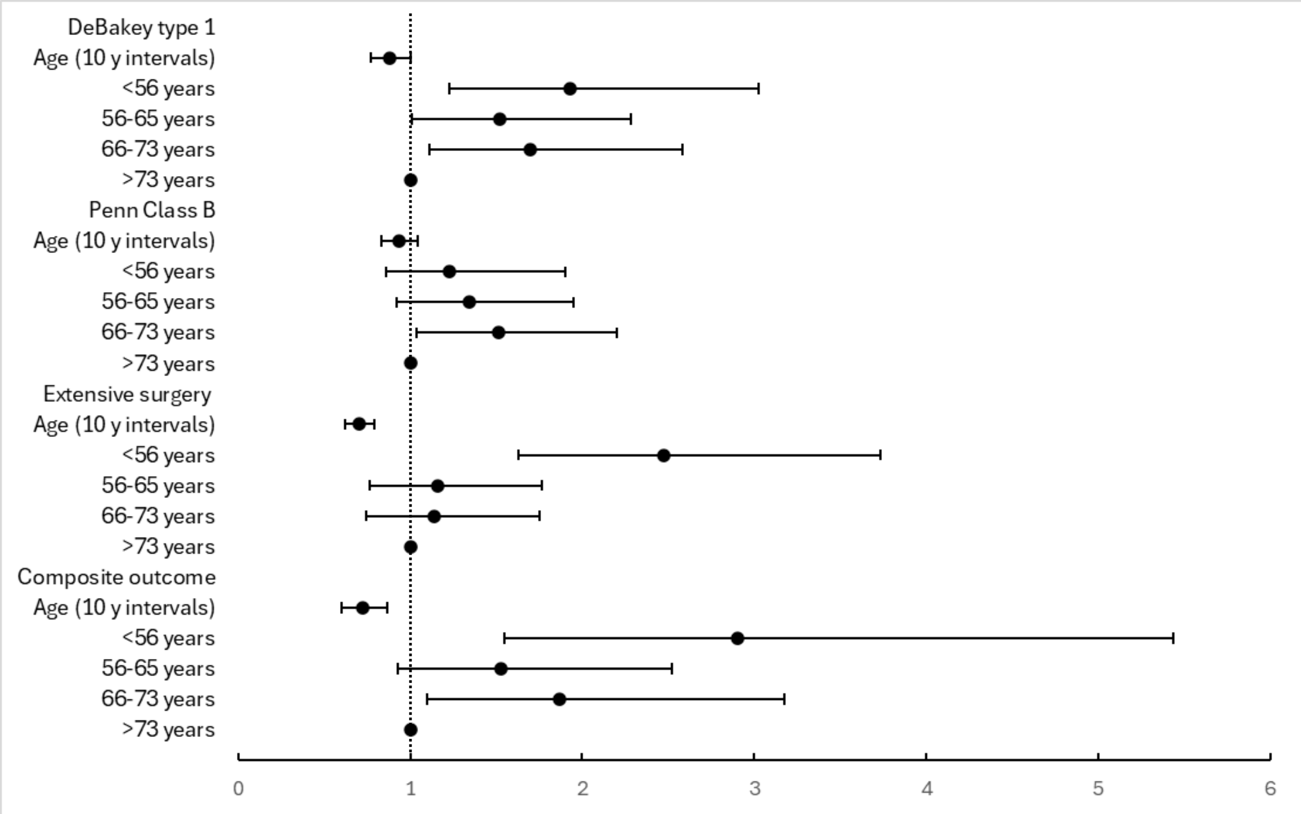
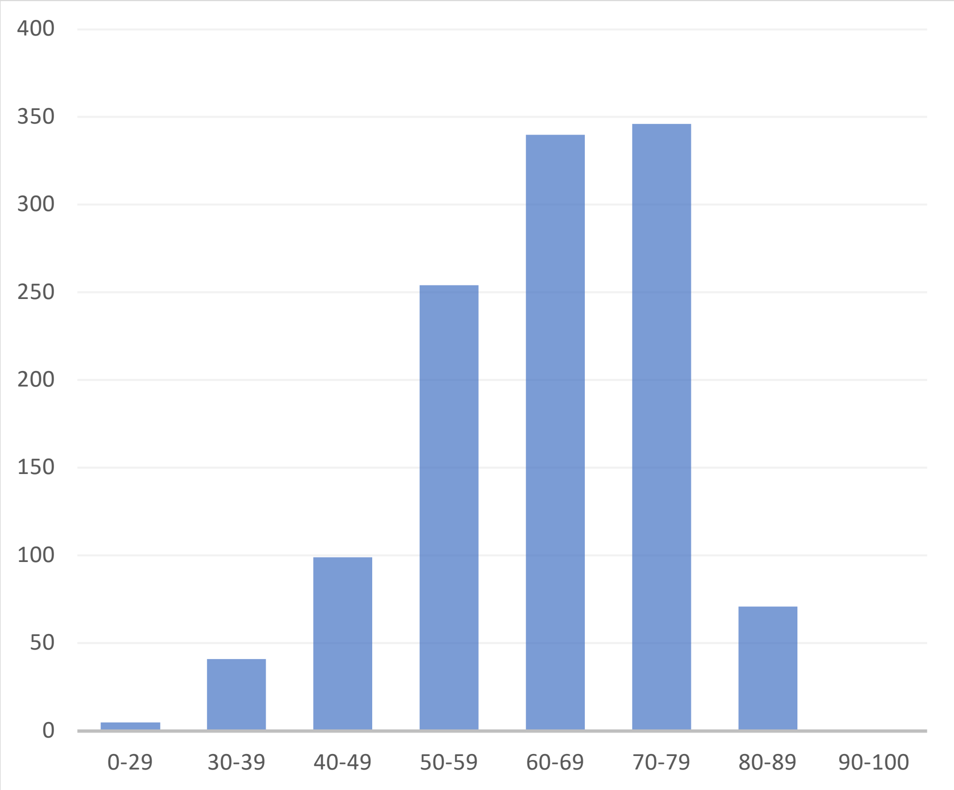
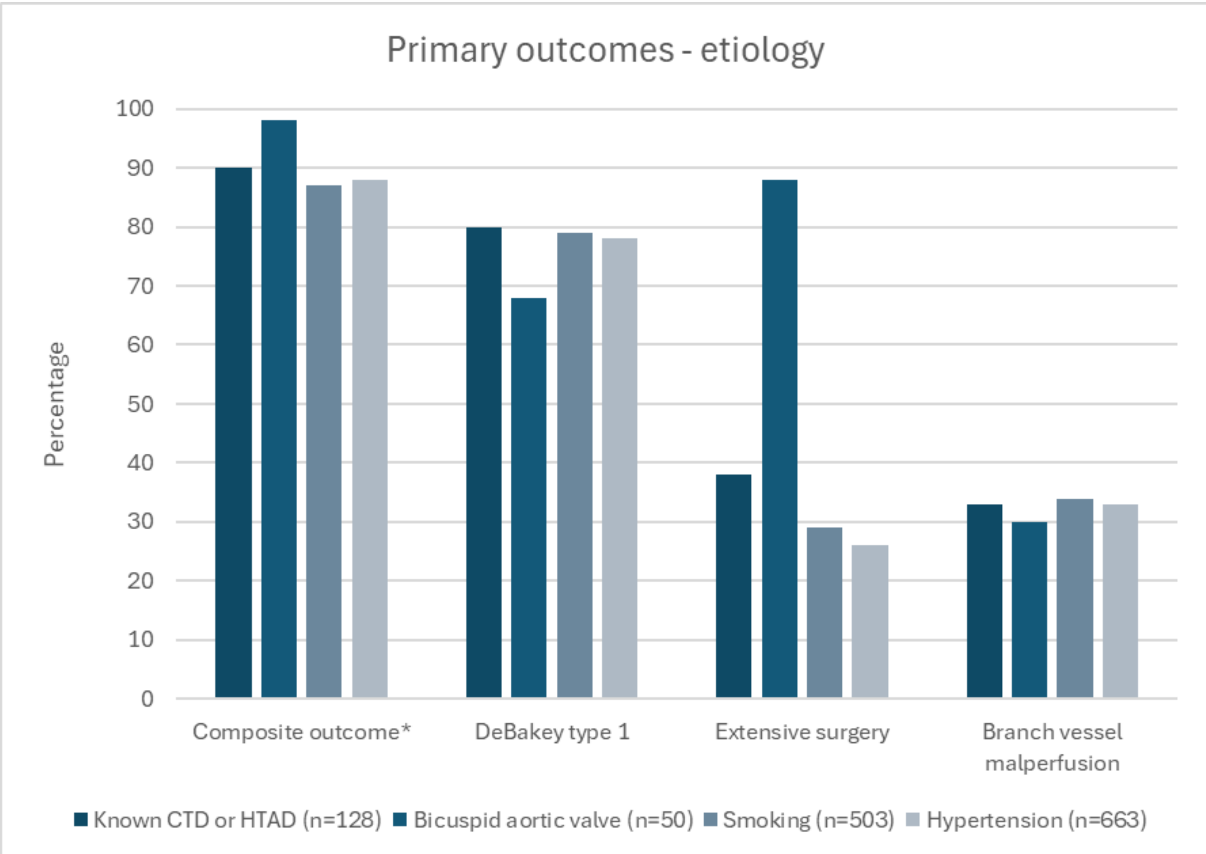


Figure 3. Forest plot of the adjusted odds ratio (aOR) for the primary and composite outcomes. aOR = adjusted for HTAD or known CTD, bicuspid aortic valve, smoking and hypertension. >73 years = reference group.

Additional materials





Long-term clinical outcomes after bioprosthetic aortic valve replacement in young women: a SWEDEHEART study

Ruixin Lu[1], Magnus Dalén[1,2], Michael Dismorr[1], Natalie Glaser[1,3], Ulrik Sartipy[1,2]
[1] Department of Molecular Medicine and Surgery, Karolinska Institutet, Stockholm, Sweden, [2] Department of Cardiothoracic Surgery, Karolinska University Hospital, Stockholm, Sweden , [3] Department of Cardiology, Stockholm South General Hospital, Stockholm, Sweden

The authors have chosen not to publish the abstract

Favourable outcome after minimally invasive mitral repair in Sweden

Emma C Hansson, Andreas Martinsson, Silvana Kontogeorgos, Carl Johan Malm

Background and aim

Minimally invasive cardiac surgery (MICS), for mitral valve repair or replacement has become more common in Sweden. Prior studies suggest favorable short-term outcomes. This study compares outcomes after mitral MICS compared to conventional sternotomy.

Methods

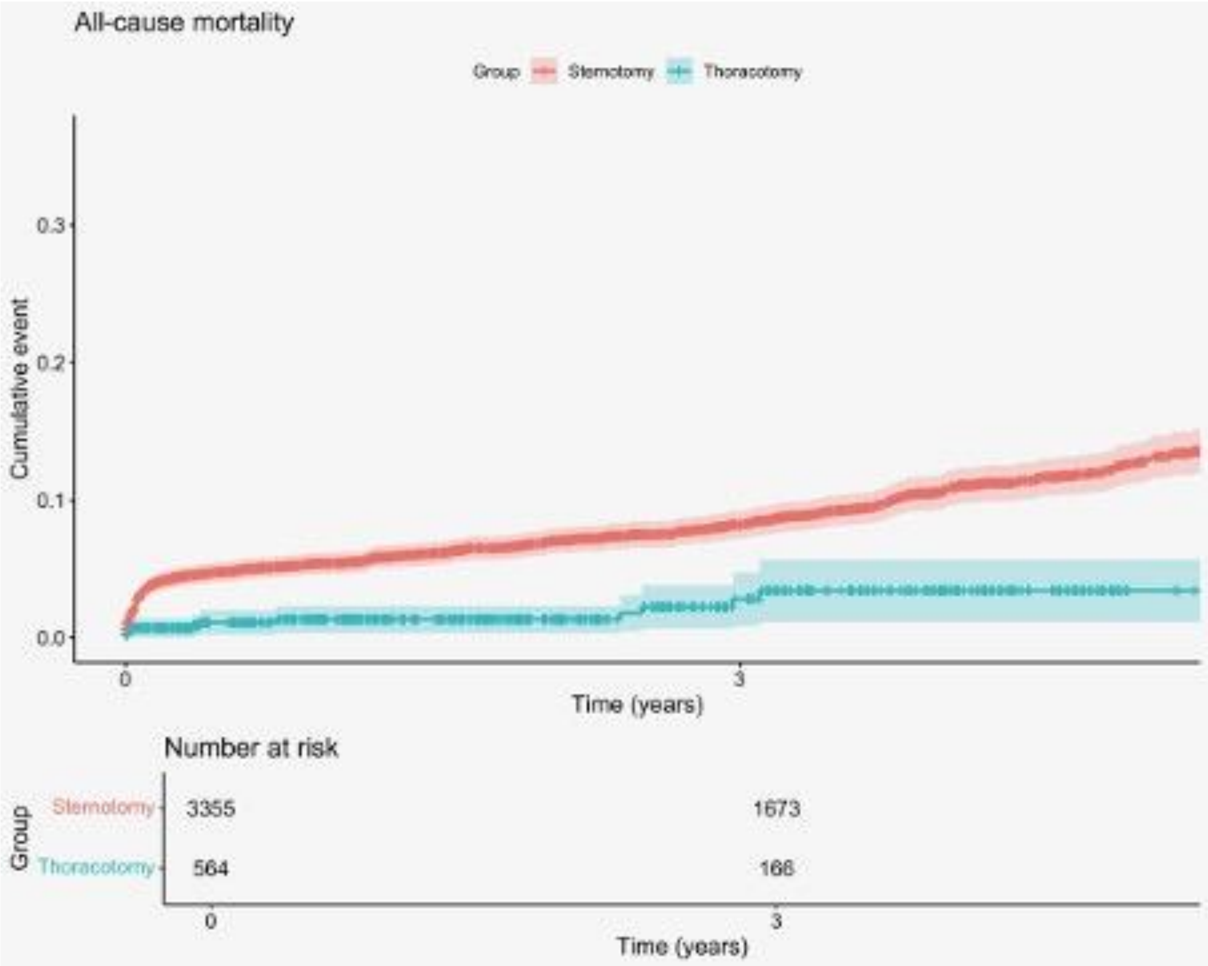
Patients who underwent mitral valve repair or replacement in Sweden 2001-2020 were identified in the Swedish Cardiac Surgery Registry. Data was linked to other mandatory health care registries. Outcomes were all-cause mortality, cardiovascular mortality and readmission for heart failure, analyzed using Cox regression adjusted for age, sex and comorbidities. Median follow-up time was 2.8 years (IQR 1.2-4.6).

Results

MICS was performed in 564 (14%) patients, and sternotomy in 3355 (86%). MICS patients were younger (62.0 vs. 65.5 years) and had fewer comorbidities. After adjustment , MICS was associated with significantly lower all-cause mortality (adjusted Hazard Ratio (aHR) 0.34 (95%CI 0.19 -0.62)). Cardiovascular mortality (aHR 0.53 (0.19-1.46)) and readmission for heart failure (aHR 1.06 (0.70-1.61)) did not differ significantly.

Conclusions

Minimally invasive mitral valve repair or replacement is associated with favourable mid-term outcome compared with repair or replacement via sternotomy in this retrospective analysis of registry data. While patient selection likely plays an important role, adjusted analyses indicate excellent survival in these selected individuals. These findings support broader consideration of MICS in clinical practice.


All-cause mortality
Group
Sternotomy
Thoracotomy
Cumulative event
0.3
0.2
0.1
0.0
0
3
Time (years)
Number at risk
Group
Sternotomy
Thoracotomy
3355
1673
564
166
0
3
Time (years)