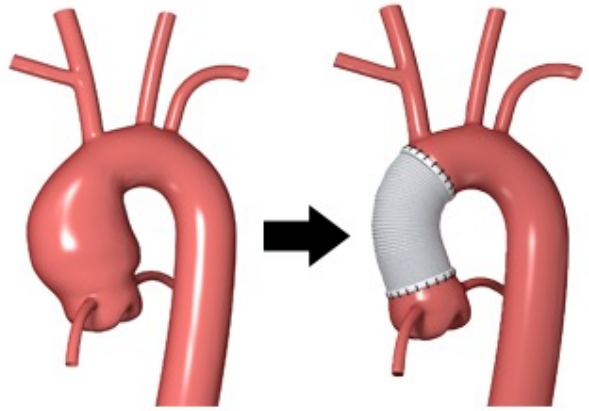
Yale SCHOOL OF MEDICINE

Mid-term Outcomes of Ascending Aortic Aneurysm Repair with Coronary Artery Bypass Grafting



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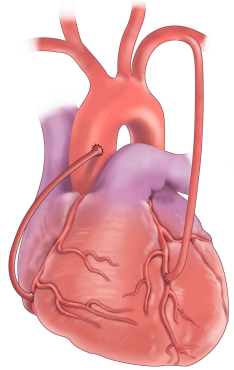

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BACKGROUND/OBJECTIVE

- Ascending aortic aneurysms (AsAA) remain a major public health concern with high morbidity/mortality and are often associated with coronary artery disease (CAD) — a comorbidity with very high incidence

- Previous studies investigating the risks of concomitant ascending aortic aneurysm (AsAA) repair and coronary artery bypass grafting (CABG) as compared to those of isolated AsAA repair have shown variable results[1-9]

- We aim to compare early and mid-term outcomes of isolated AsAA repair to those of AsAA repair with concomitant CABG in our single center experience

METHODS

- We performed a single-center, retrospective cohort study for 69 patients out of 248 who underwent AsAA repair from February 2020 to December 2022
- A matched cohort of 35 patients who received a concomitant CABG for confirmed CAD and 34 who received isolated AsAA repair was created
- Data on demographics, comorbidities, intraoperative details, as well as short and mid-term outcomes were collected and compared between the two groups
- Statistical analyses included independent t-test, Mann-Whitney U test, chi-square test, and Kaplan-Meier analysis

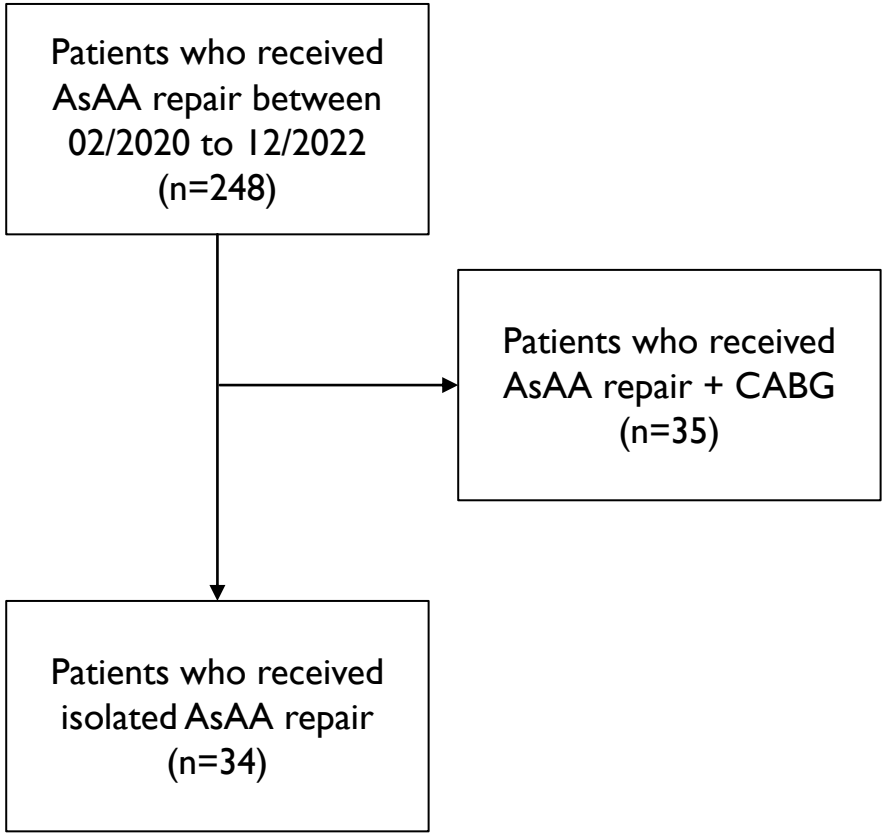

Figure 1. Flowchart describing patient inclusion

RESULTS

Table 1. Baseline Characteristics

Variable	Total (n = 69)	AsAA repair (n = 34)	AsAA + CABG (n = 35)	*P* value
Age, year	64.8 ± 7.7	64.5 ± 7.7	65.0 ± 7.9	0.779
Male, n (%)	59 (85.5)	30 (88.2)	29 (82.9)	0.734
Hypertension, n (%)	53 (76.8)	25 (73.5)	28 (80)	0.524
Diabetes mellitus, n (%)	10 (14.5)	3 (8.8)	7 (20)	0.306
Smoking, n (%)	37 (53.6)	20 (58.8)	17 (48.6)	0.393
CKD, n (%)	7 (10.1)	3 (8.8)	4 (11.4)	1.000
Dyslipidemia, n (%)	47 (68.1)	23 (67.6)	24 (68.6)	0.934
Atrial fibrillation, n (%)	8 (11.6)	2 (5.9)	6 (17.1)	0.259
Bicuspid aortic valve, n (%)	29 (42)	17 (50)	12 (34.3)	0.186
Prior MI, n (%)	3 (4.3)	0	3 (8.6)	0.239
Triglycerides	121.7 ± 55.0	108.7 ± 46.7	134.3 ± 60.1	0.053
Antiplatelet drug, n (%)	34 (49.3)	12 (35.3)	22 (62.9)	0.022
Aneurysm Size (mm)	47.1 ± 4.9	47.3 ± 5.6	46.8 ± 4.3	0.687

- The two groups were similar at baseline except for lower triglyceride levels (108.7 ± 46.7 vs 134.3 ± 60.1; p = 0.053) and less antiplatelet use (35.3 vs 62.9%; p = 0.022) in isolated AsAA patients

Values reported as mean ± standard deviation

RESULTS

Table 2. Intraoperative Details and Operative Outcomes

Variable	Total (n = 69)	AsAA repair (n = 34)	AsAA + CABG (n = 35)	*P* value
CPB time, min	282 ± 86	259 ± 84	305 ± 83	0.027
Cross-clamp time, min	203 ± 82	174 ± 73	230 ± 82	0.003
AAo tube graft, n (%)	54 (78.3)	27 (79.4)	27 (77.1)	0.819
Hemiarch repair, n (%)	60 (87)	28 (82.4)	32 (91.4)	0.306
Total arch repair, n (%)	5 (7.2)	4 (11.8)	1 (2.9)	0.198
Red blood cell, n (%)	29 (42)	15 (44.1)	14 (40)	0.729
Platelet, n (%)	65 (94.2)	31 (91.2)	34 (97.1)	0.356
Operative mortality	0	0	0	1.000
IABP use	1 (1.4)	0	1 (2.9)	1.000
Intubation time, hour	45.5 ± 96.6	57.5 ± 133.7	35.2 ± 45.6	0.356
Length of stay, day	10.6 ± 8.2	8.1 ± 5.0	12.9 ± 9.9	0.013
Length of ICU stay, hour	98.7 ± 83.0	85.9 ± 84.5	112.2 ± 80.6	0.200
Stroke, n (%)	1 (1.4)	1 (2.9)	0	1.000
Acute kidney Injury, n (%)	1 (1.4)	1 (2.9)	0	1.000
Reexploration, n (%)	1 (1.4)	0	1 (2.9)	1.000

- Concomitant CABG was associated with significantly longer CPB (304 vs 259 min; p = 0.027) and cross-clamp times (230 vs 174 min; p = 0.003) as well as longer length of stay (13 vs 8 days, p = 0.013)
- However, neither group had operative deaths, and the groups did not differ significantly in terms of IABP use, stroke, acute kidney injury, or reexploration for bleeding
- Need for transfusion of RBCs (p = 0.729) or platelets (p = 0.356), intubation time (p = 0.356), and length of ICU stay (p = 0.200) did not differ significantly between the two groups

RESULTS

SURVIVAL

- Follow-up was complete in 100% of patients with a mean duration of 2.3 ± 0.9 years
- There were 2 late deaths in the CABG group
- One patient died from sternal wound abscess at 4 months and another from COVID-19 pneumonia at 2 years
- For the whole series of patients, survival was **98.6%** (95% confidence interval [CI]; 91.2-99.8%) at **1 year** and **96.4%** (95% CI; 85.9-99.1%) at **3 years**
- Survival **did not significantly differ** between patients with and without CABG (93.1% vs. 100%, p=0.174)

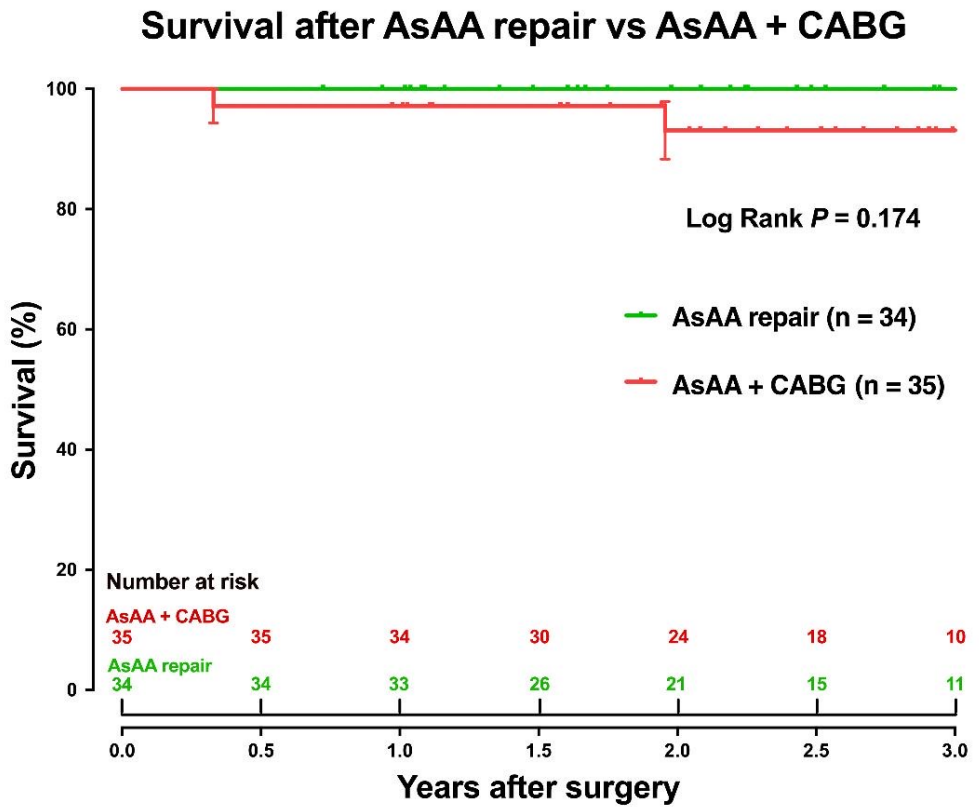

Figure 2. Kaplan-Meier Curve comparing AsAA and CABG group survival

RESULTS

REOPERATION

- Three patients in the AsAA group underwent TEVAR for type B dissection at 3.3, 4.2, and 18.4 months
- For the whole series, freedom from reintervention was **97.1%** (95%; CI; 88.9-99.3%) at **1 year** and **93.6%** (95% CI; 79.5-98.1%) at **3 years**
- Freedom from reintervention **did not significantly differ** between patients with and without CABG (94.3% vs. 100%, p=0.101)

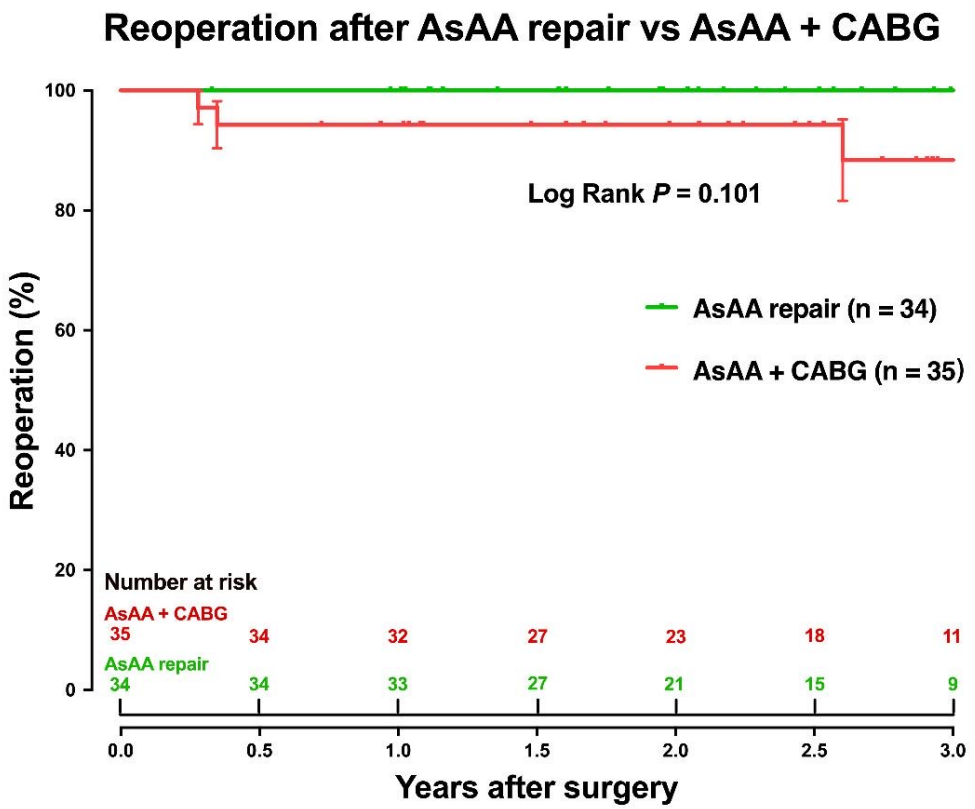

Figure 3. Kaplan-Meier Curve comparing AsAA and CABG group reoperation

CONCLUSIONS

- Concomitant CABG during ascending aortic aneurysm repair was not associated with increased risks for operative mortality or morbidities
- Patients with concomitant CABG during ascending aortic aneurysm repair demonstrated comparable mid-term survival and freedom from reoperation as compared to those undergoing isolated ascending aortic aneurysm repair
- These findings suggest that CABG may be safely performed during ascending aortic aneurysm repair when necessary

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