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**Radial artery versus saphenous vein
for coronary artery bypass surgery
at long-term follow-up**

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DISCLOSURES



NONE

BACKGROUND



- Observational studies suggest that the use of radial artery grafts (RA) for coronary artery bypass (CABG) may improve outcomes compared with use of saphenous vein grafts (SVG)
- The Radial Artery Database International Alliance (RADIAL), a patient-level meta-analysis of five randomized trials, reported a reduction in cardiac events at 5 years, but without difference in survival
- The 5-year analysis was likely underpowered and possibly driven by revascularization following protocol mandated angiography

Details of the trials included



	Petrovic	RAPCO	RSVP	Nasso	Song
Study period (enrollment)	2001-2003	1997-2004	1998-2000	2003-2006	2008-2009
Country of origin	Serbia	Australia	United Kingdom	Italy	South Korea
Total number of patients	200	225	142	409	60
Age (overall), years (Mean±SD)	56.4±6.1	72.8±4.7	58.5±6.7	70.3±7.7	75.7±5.4
Females (overall) (%)	27.0	19.1	3.5	43.0	50.0
Diabetes, n (%)	RA: 39 (39) SVG: 43 (43)	RA: 27 (37) SVG: 37 (46)	RA: 15 (18) SVG: 10 (17)	RA: 73 (36.1) SVG: 77 (38.1)	RA: 15 (42.9) SVG: 13 (52.0)
RA target vessel stenosis (%)	>80	>70	>70	>70	NR
% of RA grafts to the circumflex coronary artery	83	100	100	47	98
Crossover rate (%)	0.0	3.6	0.0	4.2	0.0

METHODS



- Clinical follow-up **to 10 years or to the maximal possible follow-up** for each patient was requested from the individual trials' teams
 - Follow-up was performed by telephone interview for Nasso, RAPCO and Petrovic trials
 - For the Radial Artery Versus Saphenous Vein Patency (RSVP) trial, the Royal Brompton & Harefield NHS Foundation Trust electronic patient record database and questionnaires sent to general practitioners were used
 - For the Song trial, the Statistic Korea database as well as telephone interviews were used

METHODS

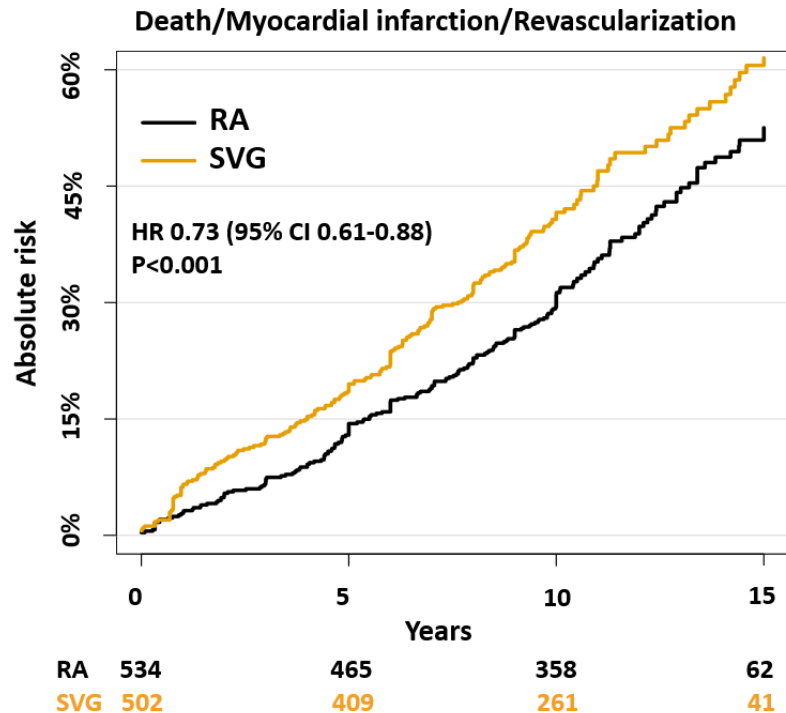


- The **primary outcome** was a composite of **death, myocardial infarction** and **repeat revascularization**
- The **secondary outcome** was a composite of **death** and **myocardial infarction**
- **Death** was not a pre-specified outcome, and was analyzed post-hoc
- A mixed-effect Cox regression model was used
- The **median follow-up time was 10 years** in both groups (1st-3rd quartile 10-11)
- 942/1036 (**90.9%**) of patients had a **follow-up of at least 10 years**

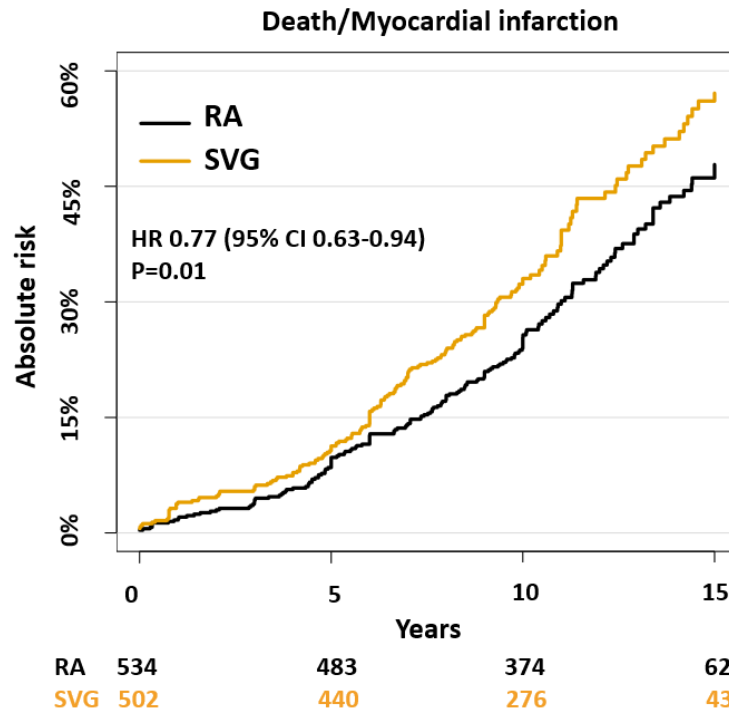
Baseline characteristics of the patients

	Radial Artery Graft Group (N=534)	Saphenous Vein Graft Group (N=502)	P value
Age, mean (SD)	66.6 (9.3)	67.1 (9.8)	0.42
Male, n(%)	376 (70.4)	351 (69.9)	0.92
Diabetes, n(%)	181 (33.9)	177 (35.3)	0.69
Prior myocardial infarction, n(%)	164 (30.7)	160 (31.9)	0.74
Elective admission, n(%)	469 (87.8)	456 (90.8)	0.14
Renal insufficiency, n(%)	45 (8.4)	46 (9.2)	0.76
Left ventricular ejection fraction <50%, n(%)	70 (13.1)	64 (12.7)	0.93
Target vessel			0.13
Left circumflex coronary artery, n(%)	415 (77.7)	369 (73.5)	
Right coronary artery, n(%)	119 (22.3)	133 (26.5)	
N of grafts, mean (SD)	3.1 (0.7)	3.1 (0.6)	0.53
Proximal Anastomosis site			0.10
Ascending aorta, n(%)	489 (91.5)	474 (94.4)	
Internal thoracic artery, n(%)	45 (8.5)	28 (5.6)	

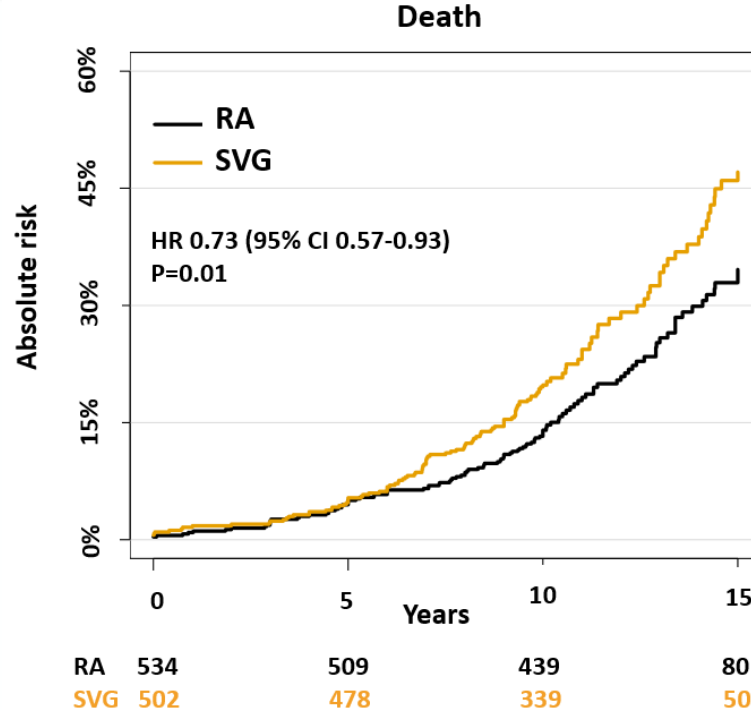
Cumulative incidence of the primary composite outcome in the RA vs SVG groups



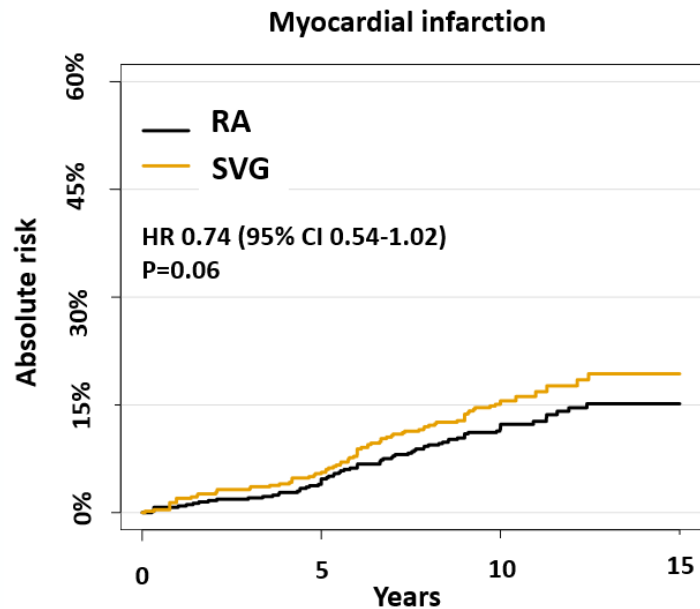
Cumulative incidence of the secondary composite outcome in the RA vs SVG groups



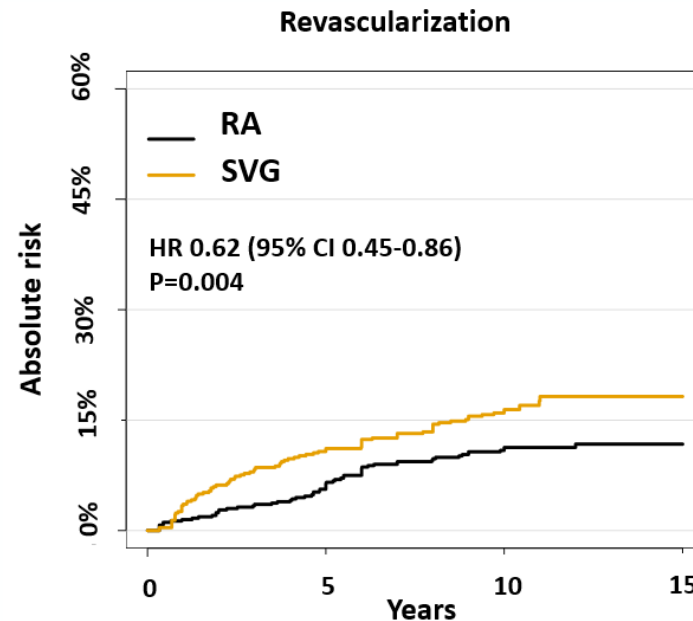
Cumulative incidence of death in the RA vs SVG groups



Cumulative incidence of Myocardial infarction (left) and Repeat revascularization (right) in the RA vs SVG group

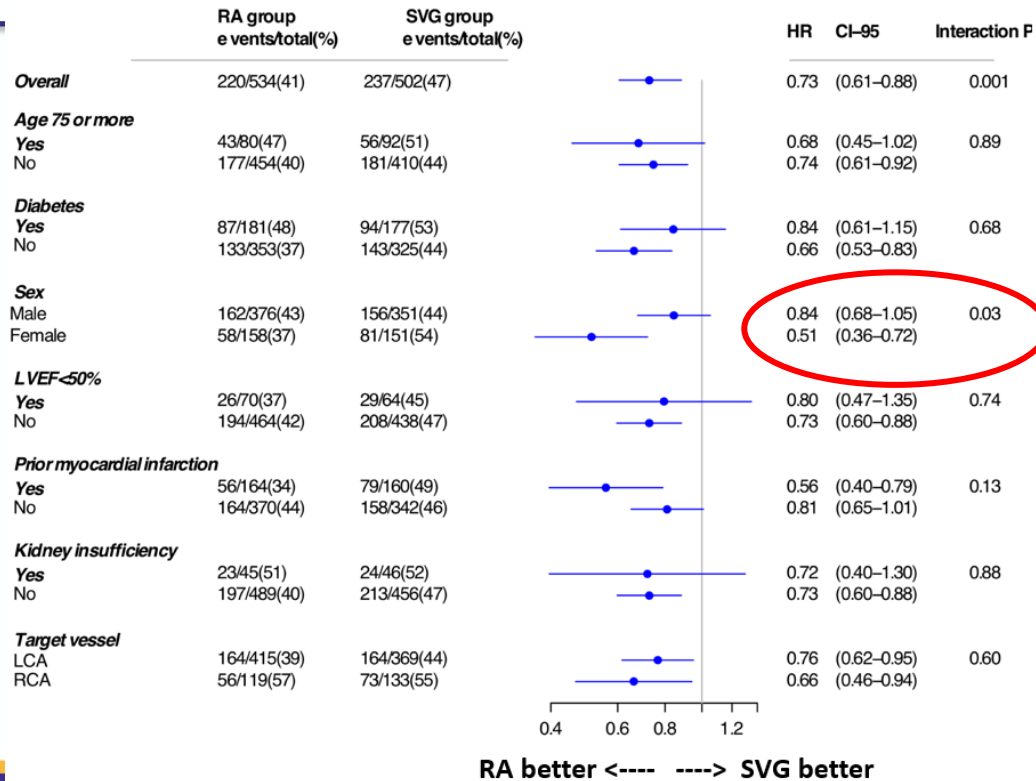


RA	534	488	384	64
SVG	502	445	287	44



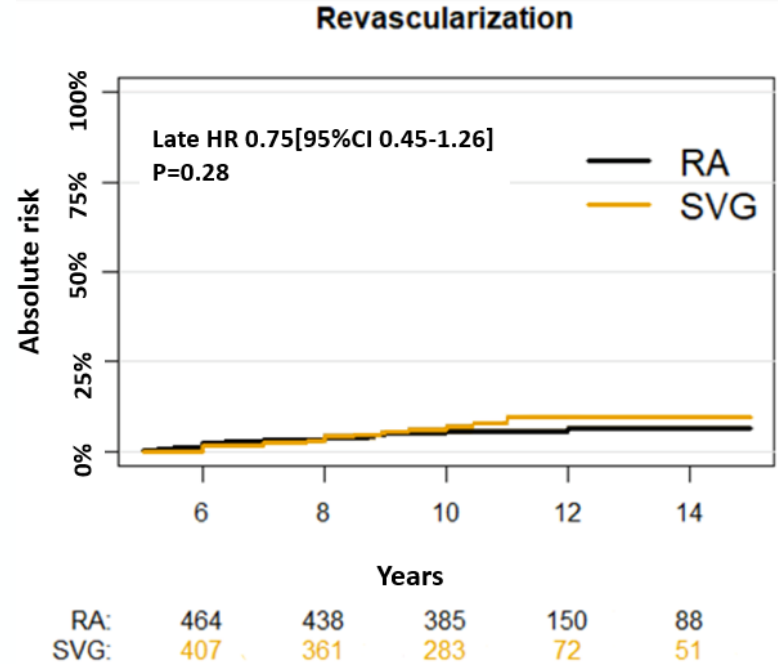
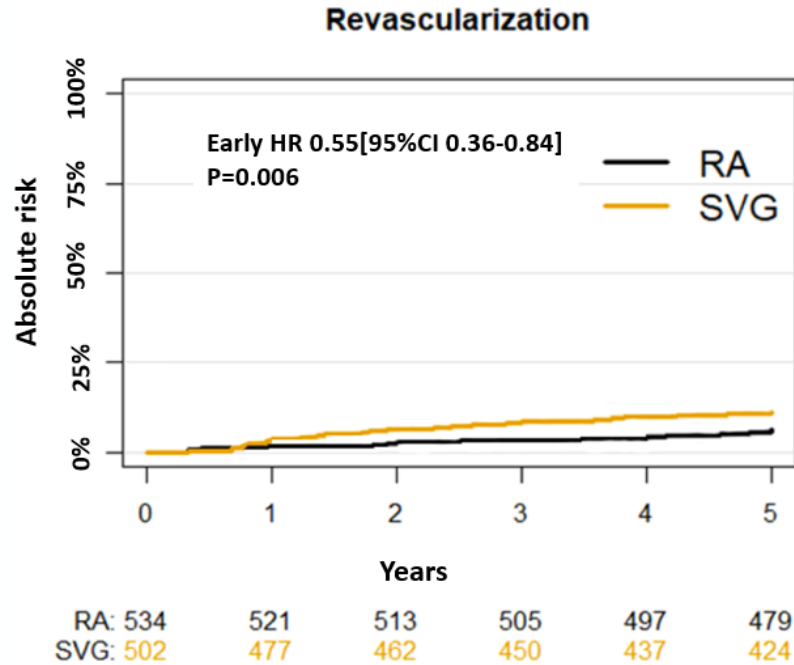
RA	534	479	385	74
SVG	502	424	283	42

Subgroup analysis and interaction terms for the primary composite outcome of Death, Myocardial infarction, or Repeat revascularization

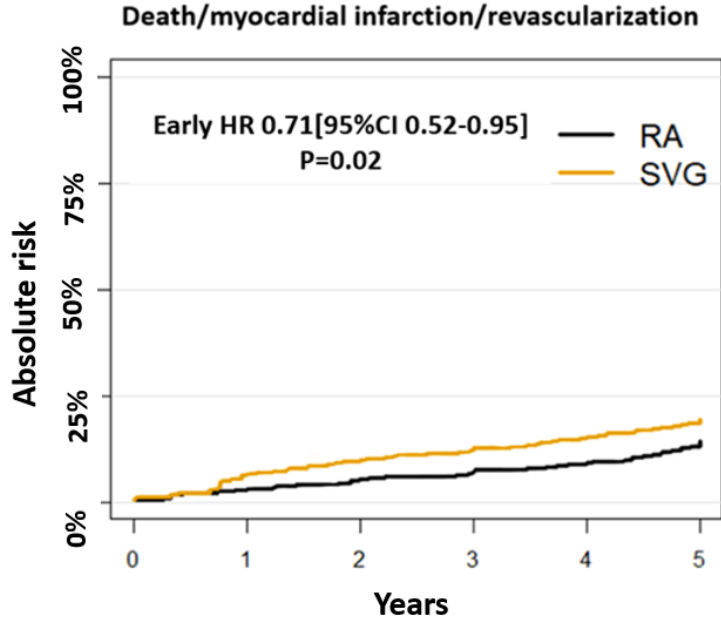


Time segmented analysis for repeat revascularization

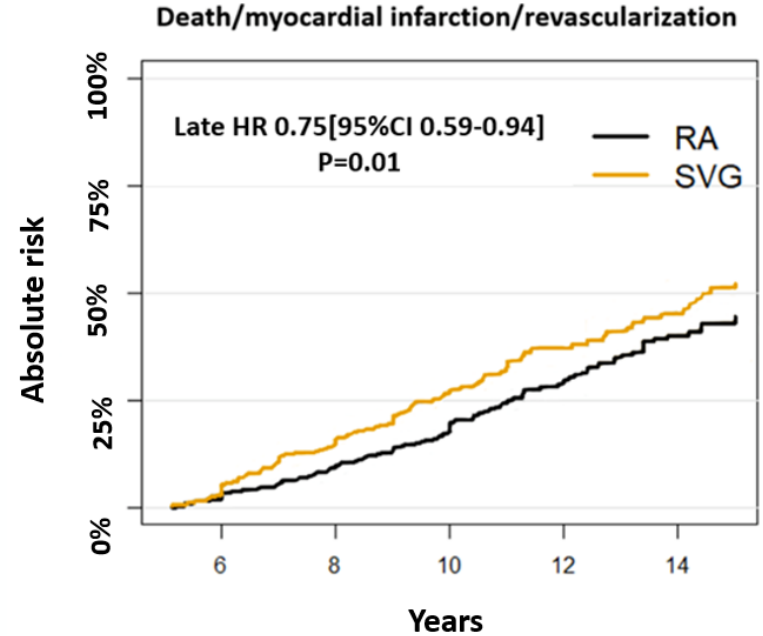
(left panel: events in the first five years of follow-up, right panel: events after the fifth year of follow-up)



Time segmented analysis for the composite of death, myocardial infarction or revascularization (left panel: events in the first five years of follow-up, right panel: events after the fifth year of follow-up)



RA:	534	519	506	497	486	465
SVG:	502	471	454	441	427	409



RA:	440	406	208	126	71
SVG:	377	329	129	64	47

Main outcomes



	Radial Artery Graft Group (N=534)			Saphenous Vein Graft Group (N=502)			Treatment effect*	
	No. of events (%)	Events per 1000 patient-years†	Cumulative incidence at 10 and 15 years	No. of events (%)	Events per 1000 patient-years†	Cumulative incidence at 10 and 15 years	Hazard ratio (95%CI)	P value
Death, myocardial infarction, or repeat revascularization	220 (41.2)	41	10y 31.0%(27.0-34.9) 15y 52.5%(46.1-58.9)	237 (47.2)	47	10y 41.6%(37.2-46.0) 15y 61.5%(54.5-68.6)	0.73 (0.61-0.88)	<0.001
Death or myocardial infarction	188 (35.2)	35	10y 25.4%(21.6-29.1) 15y 47.8%(41.2-54.5)	193 (38.4)	38	10y 33.0%(28.8-37.3) 15y 57.1%(49.5-64.7)	0.77 (0.63-0.94)	0.01
Death	128 (24.0)	24	10y 14.0%(11.1-17.0) 15y 34.6%(28.2-41.0)	134 (26.7)	27	10y 19.8%(16.2-23.4) 15y 47.1%(38.9-55.3)	0.73 (0.57-0.93)	0.01
Myocardial infarction	72 (13.5)	13	10y 12.0%(9.2-14.7) 15y 15.2%(11.6-18.7)	81 (16.1)	16	10y 15.6%(12.3-18.8) 15y 19.3%(14.8-23.8)	0.74 (0.54-1.02)	---
Repeat revascularization	63 (11.8)	12	10y 11.3%(8.6-14.0) 15y 11.8%(8.9-14.6)	86 (17.1)	17	10y 16.4%(13.2-19.7) 15y 18.2%(14.4-22.0)	0.62 (0.45-0.86)	----

*Results from mixed effect Cox regression model with individual trials included as a random effect (Saphenous Vein Graft Group is the reference group)

CONCLUSIONS



- In this individual participant data meta-analysis with a median follow up of 10 years, among patients undergoing CABG, the use of the radial artery compared with saphenous vein grafts was associated with a **lower risk of a composite of cardiovascular outcomes and a better survival**
- This is the **first report** of a survival benefit for CABG using multiple arterial conduits based on randomized data



THANK YOU