

# **EVAR, TEVAR, and Peripheral Interventions : Data from Asan Medical Center**

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# Disclosure

- There is nothing to disclose as a conflict of interest

# TEVAR

# Anatomical classification for TEVAR

More invasive)



Zone 0/1

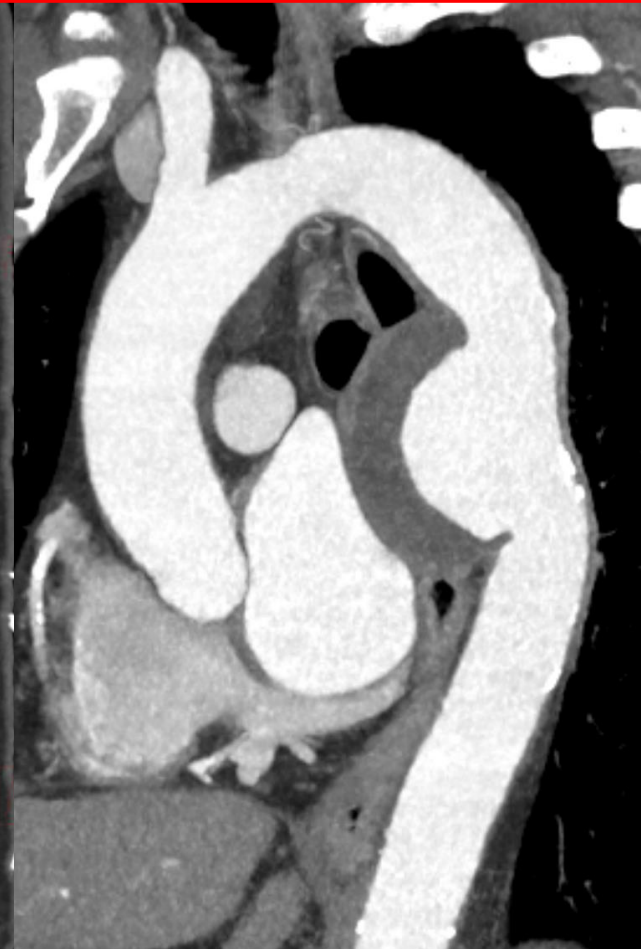
Less invasive



Zone 2

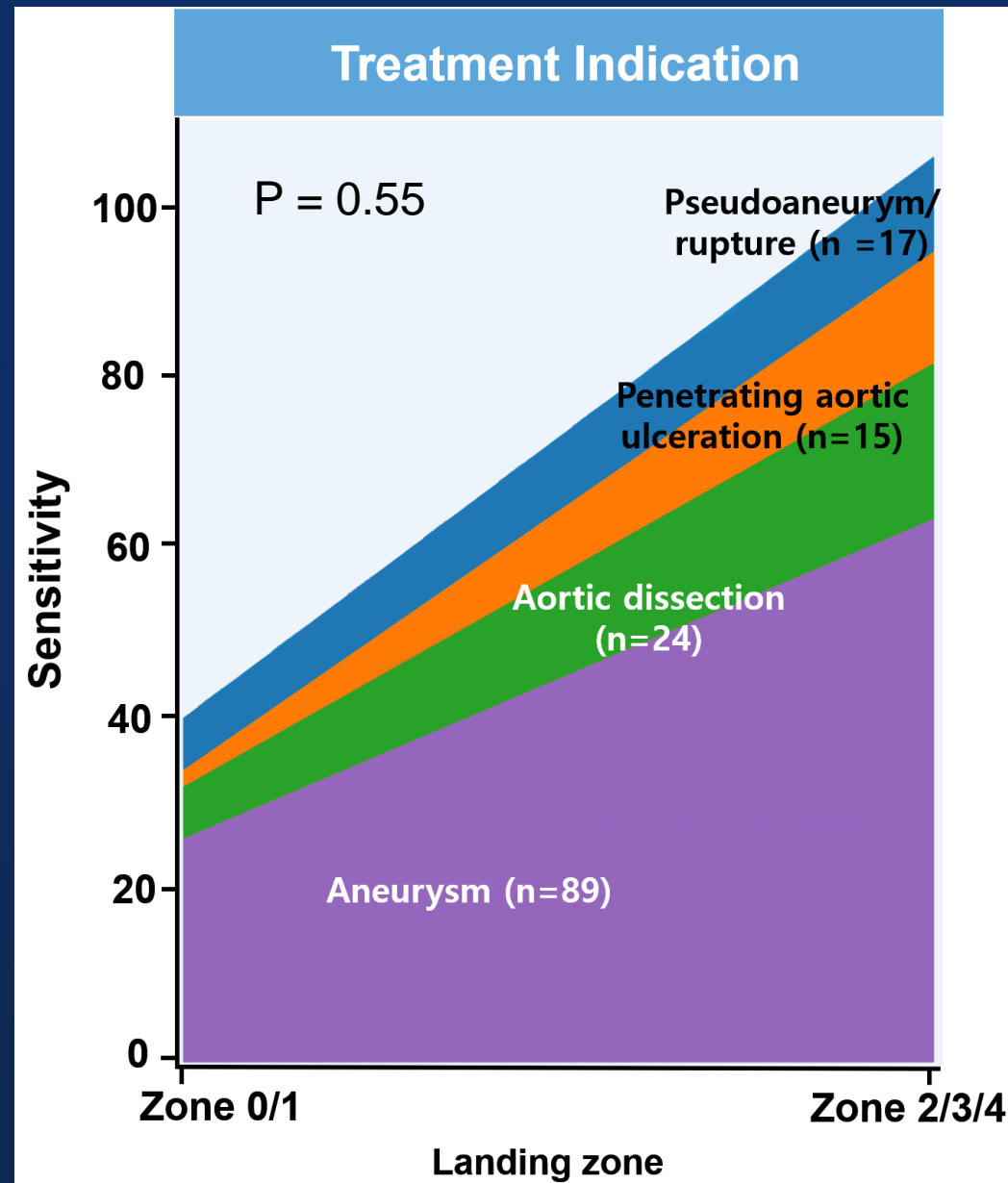
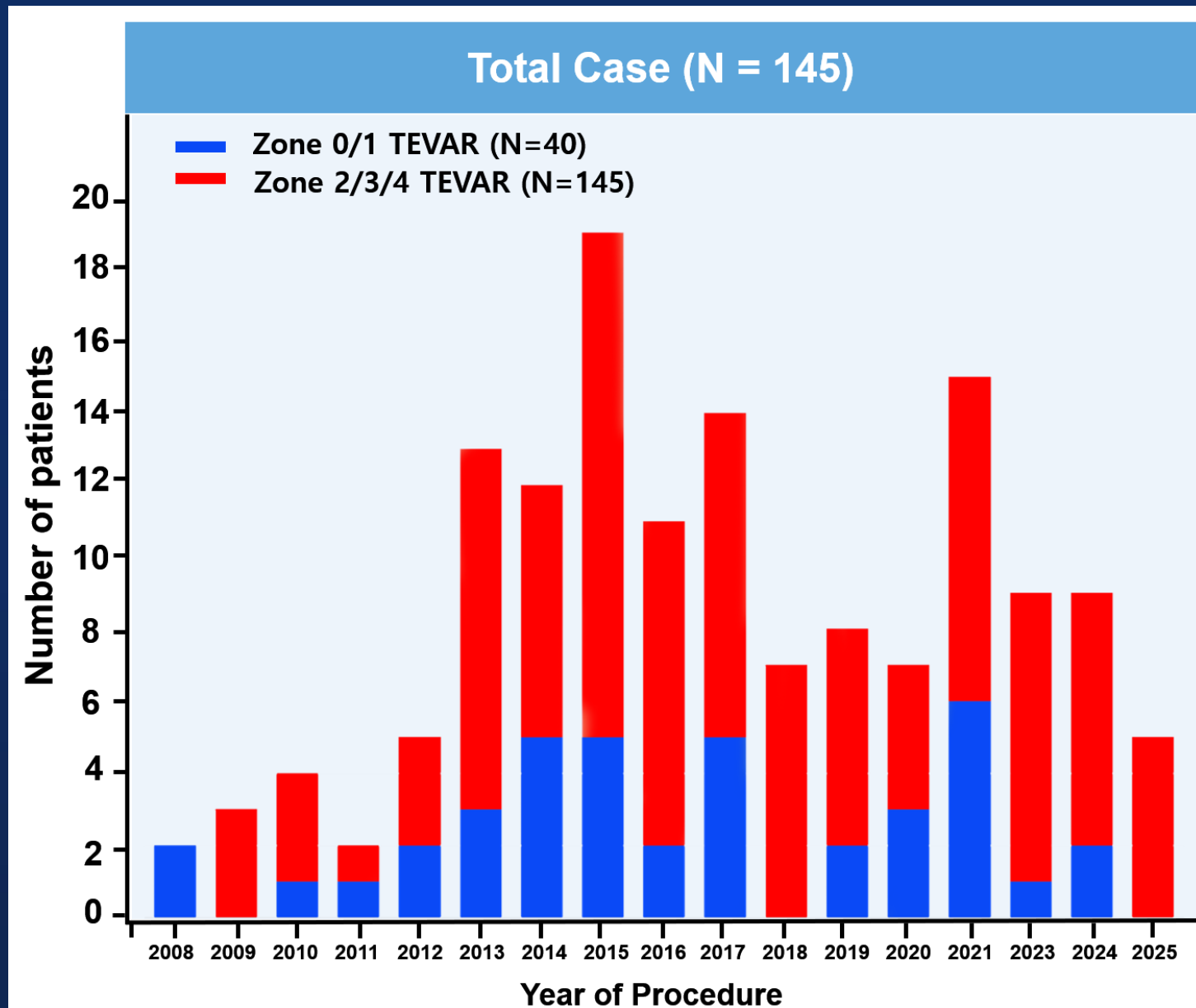


Zone 3



Zone 4

# TEVAR case at Asan Medical Center



# Baseline Clinical Characteristics

	Overall (n=145)	Zone 0/1 (n= 40)	Zone 2/3/4 (n= 105)	P value
Age, years	65.3 ± 13.3	68.2 ± 11.7	64.2 ± 13.8	0.10
Male	118 (81.4%)	30 (75.0%)	88 (83.8%)	0.33
BMI	24.7 ± 3.7	24.7 ± 3.7	24.7 ± 3.7	0.99
Risk factors				
Diabetes mellitus	26 (17.9%)	6 (15.0%)	20 (19.0%)	0.75
Hypertension	112 (77.2%)	27 (67.5%)	85 (81.0%)	0.13
Hyperlipidemia	81 (55.8%)	24 (60.0%)	57 (54.3%)	0.20
Current smoker	45 (31.0%)	12 (30.0%)	33 (31.4%)	0.44
Previous CABG	5 (3.4%)	4 (10.0%)	1 (1.0%)	0.03
Previous PCI	18 (12.4%)	4 (10.0%)	14 (13.3%)	0.85
Previous Stroke	13 (9.0%)	4 (10.0%)	9 (8.6%)	0.99
CRF	7 (4.8%)	1 (2.5%)	6 (5.7%)	0.71
Atrial fibrillation	7 (4.8%)	2 (5.0%)	5 (4.8%)	1.00
LVEF	61.0 ± 6.8	60.1 ± 6.0	61.3 ± 7.1	0.36
Indication 1. aneurysm	85 (58.6%)	26 (65.0%)	59 (56.2%)	0.55
2. dissection	24 (16.5%)	6 (15.0%)	18 (17.1%)	

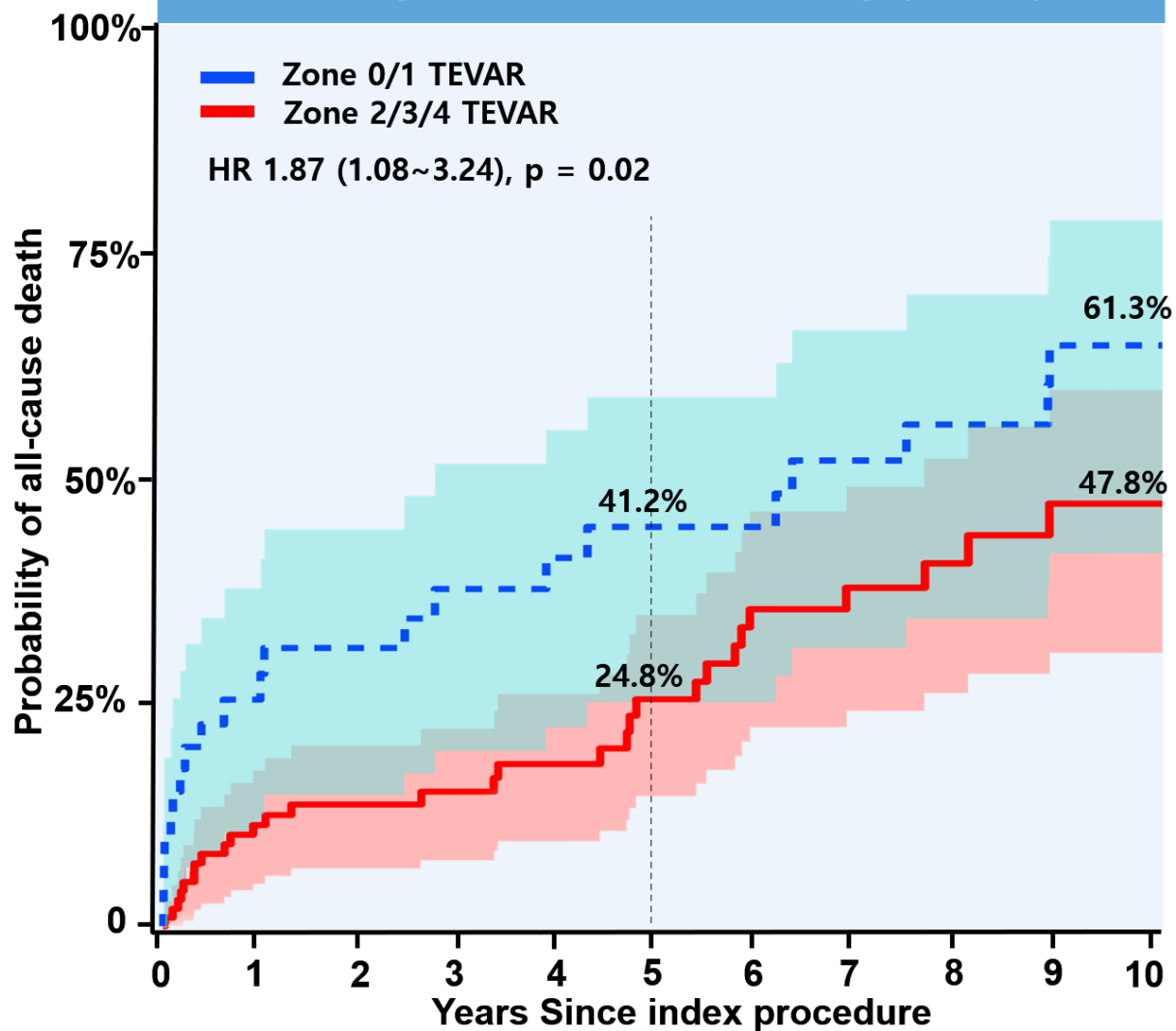
# Lesion characteristics

	Overall (n=145)	Zone 0/1 (n= 40)	Zone 2/3/4 (n= 105)	P value
CT finding				
Proximal landing zone size	30.0 ± 5.3 mm	33.5 ± 5.7 mm	28.7 ± 4.6 mm	<0.001
Sac size	50.6 ± 17.3	60.6 ± 16.1	47.3 ± 16.1	<0.001
Distal landing zone size	26.5 ± 4.1 mm	27.7 ± 4.2 mm	26.1 ± 4.0 mm	0.99
Proximal thrombus(+)	12 (8.3%)	5 (12.5%)	7 (6.7%)	0.03
Distal thrombus(+)	18 (12.4%)	5 (12.5%)	13 (12.4%)	0.27
Procedural data				
Debranching op	66 (45.5%)	39 (97.5%)	27 (25.7%)	<0.001
Elephant trunk	18 (12.4%)	13 (32.5%)	5 (4.8%)	<0.001
Distal landing zone (level)				
T5/6/7	36 (9.7%)	10 (25.0%)	26 (24.8%)	0.53
T8/9/10	100 (13.8%)	28 (70.0%)	72 (68.5%)	
Below T11	9 (6.2%)	2 (5.0%)	7 (6.6%)	
Proximal graft size	35.2 ± 4.3	36.6 ± 3.4 mm	34.7 ± 4.4 mm	0.02
Distal graft size	34.2 ± 4.3 mm	36.1 ± 3.6 mm	33.5 ± 4.4 mm	0.001
Graft length(total)	149.6 ± 36.5mm	174.5 ± 32.5 mm	139.8 ± 33.3 mm	<0.001

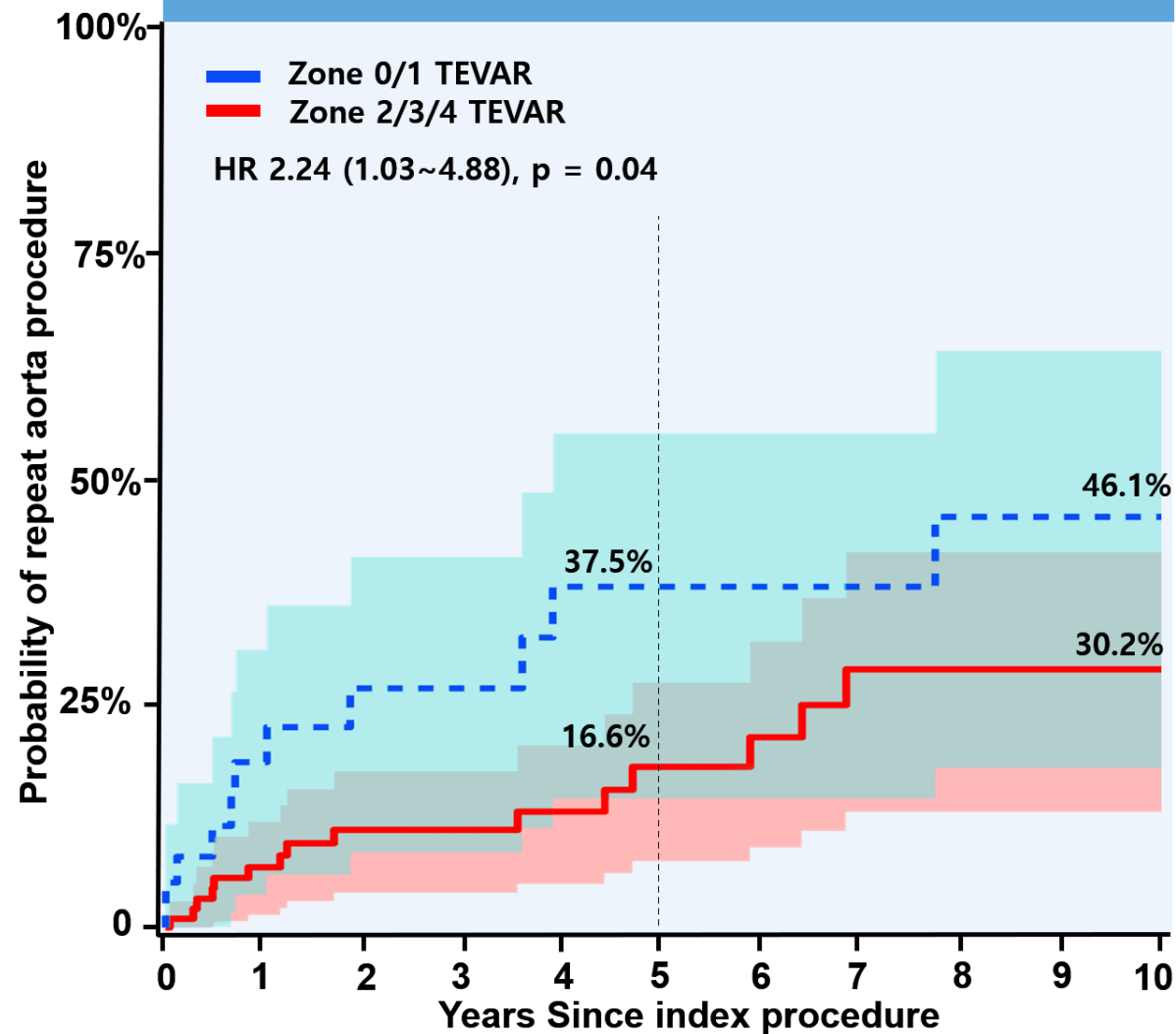
# Long-term outcome (10 years)

F/u duration: median 5.2 years, IQR 3.5~8.5)

## A. 10-year all-cause mortality (crude)



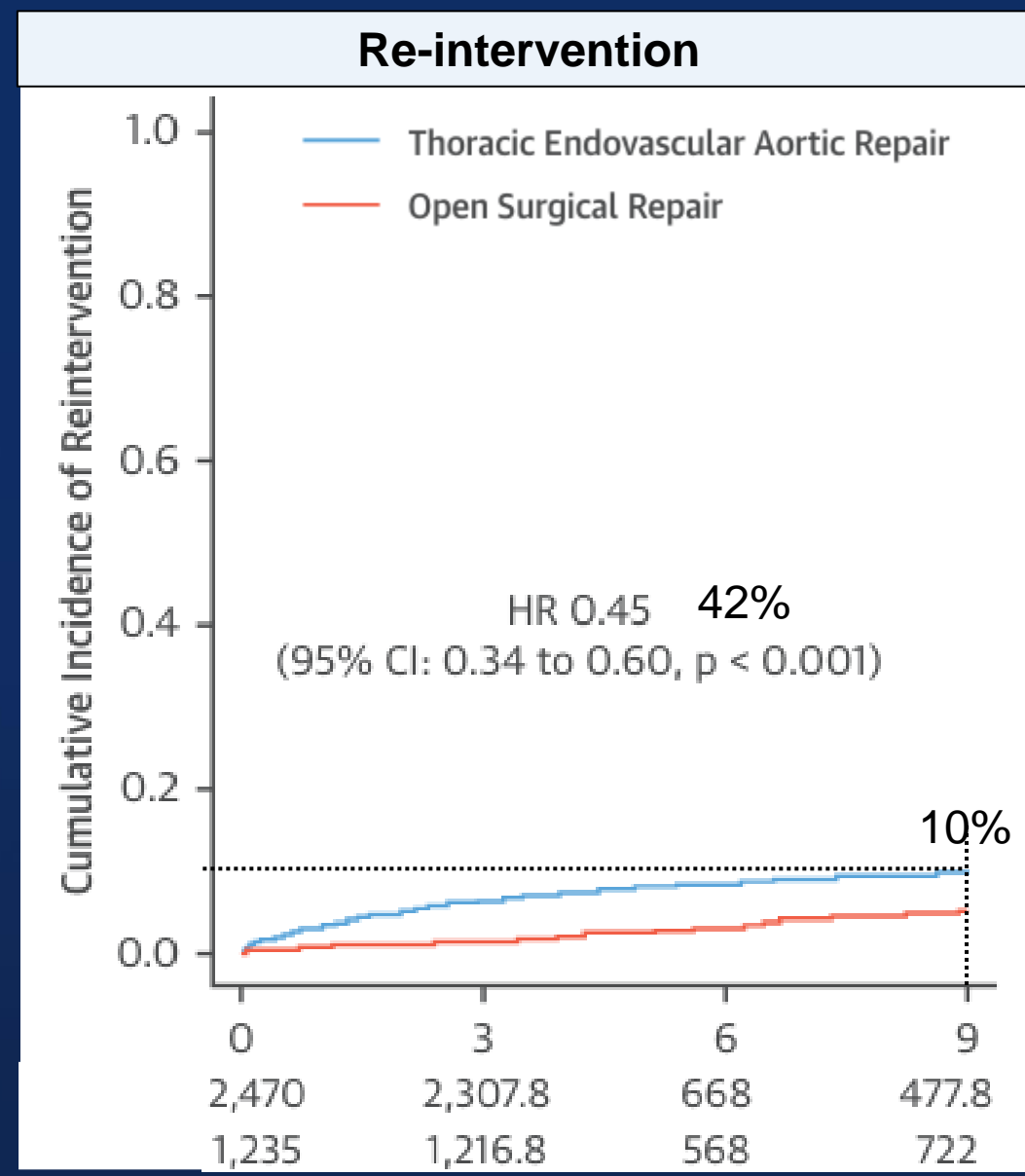
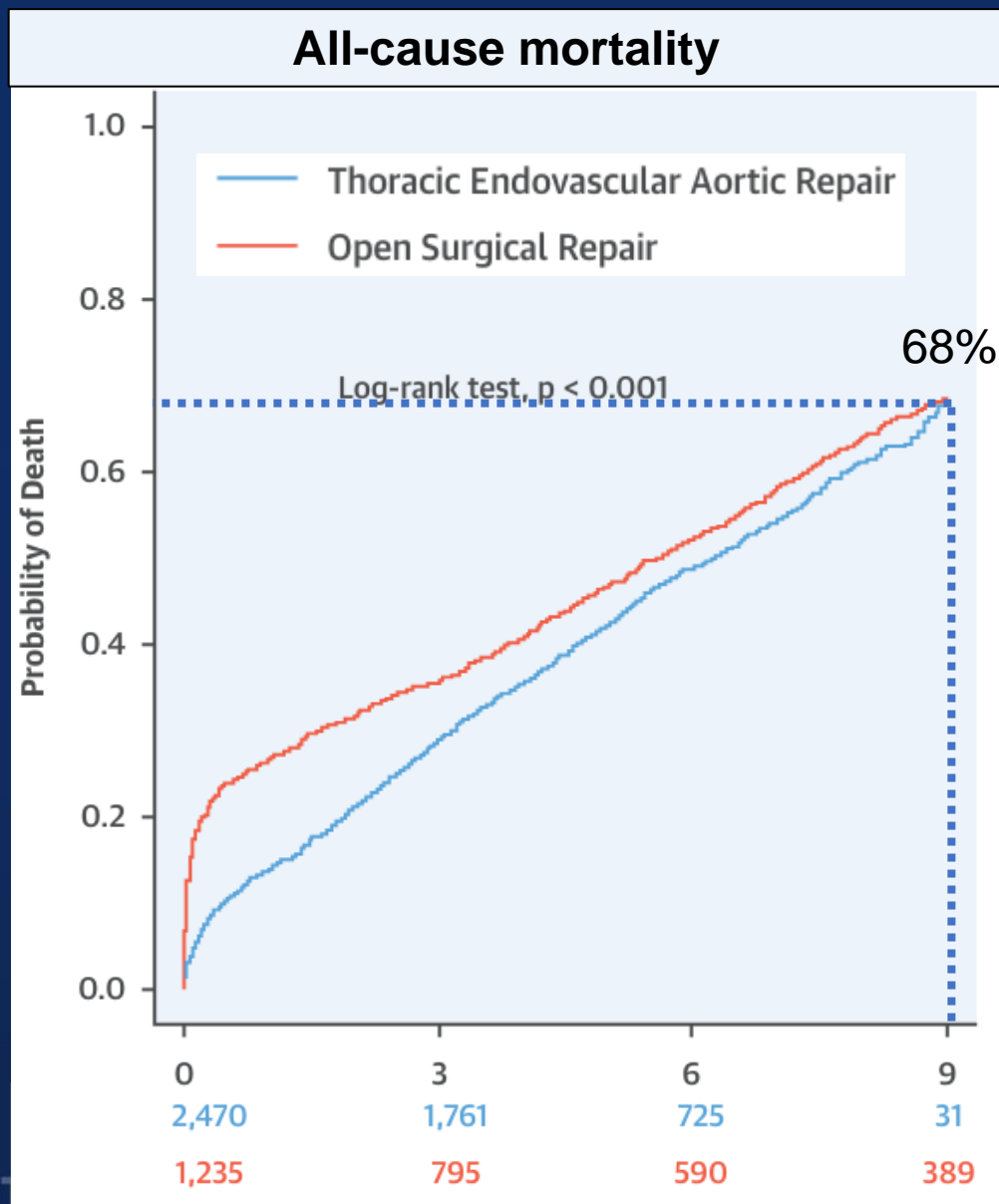
## B. 10-year Repeat Aorta Procedure (crude)





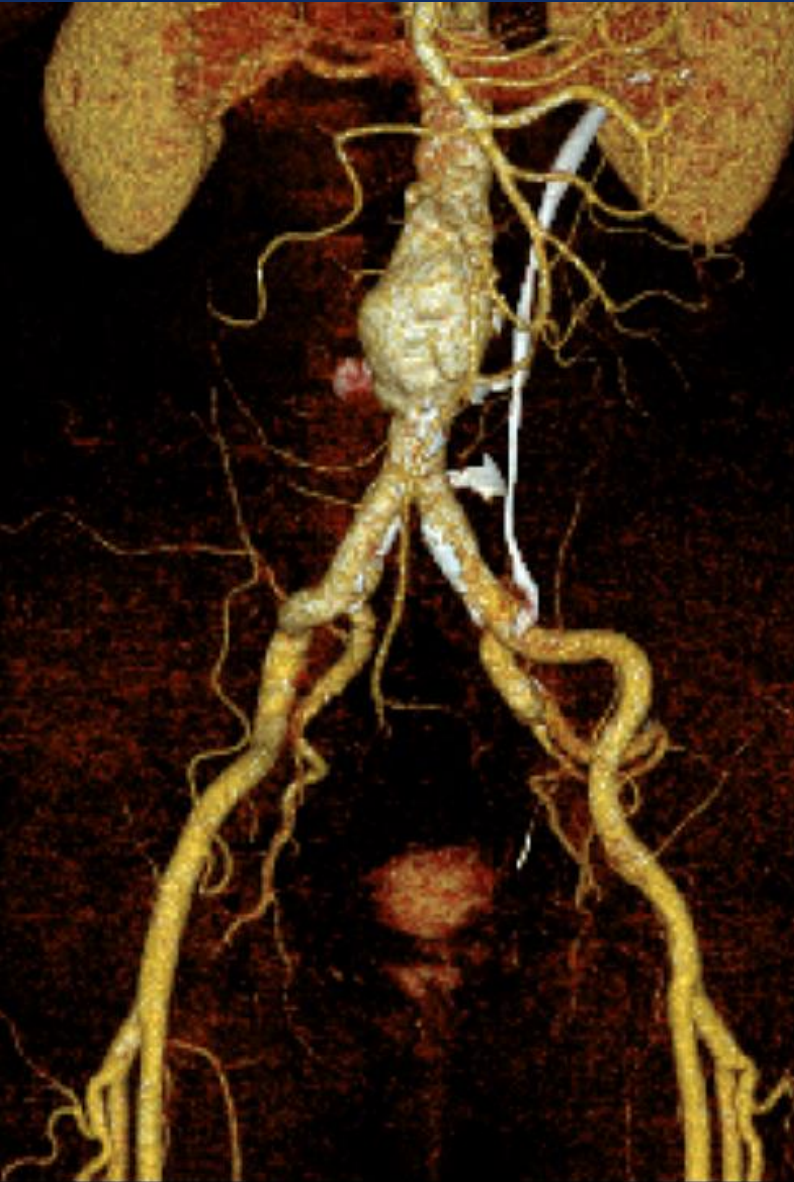
# Compared with Previous study

between 1999 and 2010 with follow-up through 2014



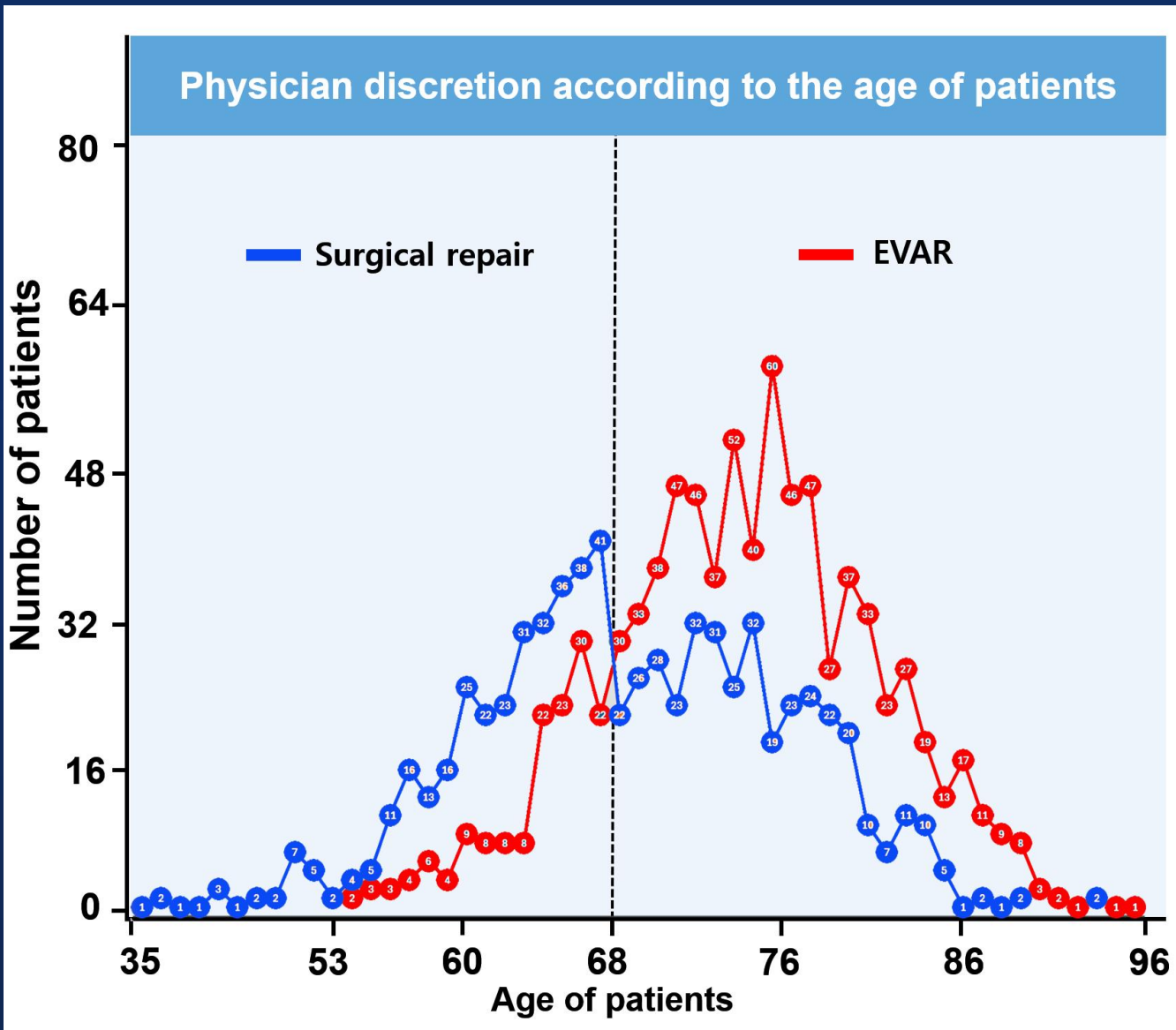
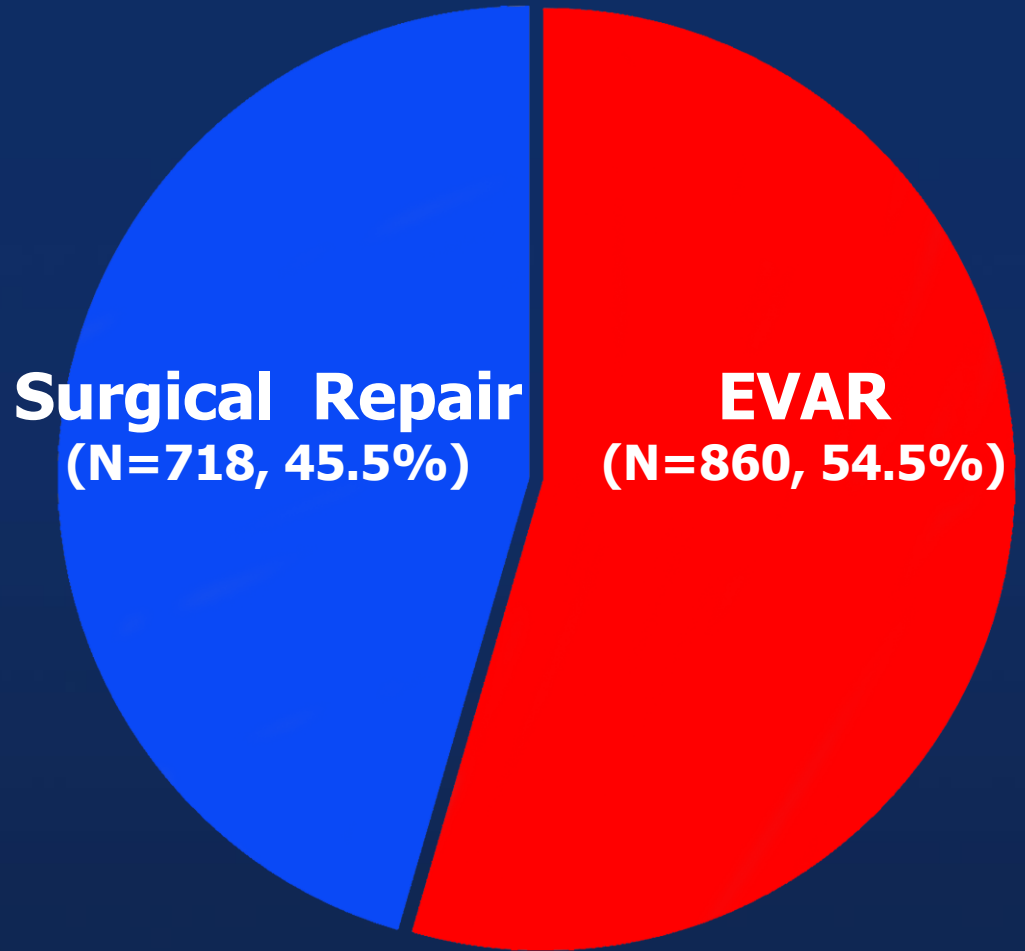
# EVAR

# AAA morphology (neck: angle, size, length, CIA aneurysm)



# EVAR vs open repair for AAA (2005~2024)

Total = 1578 (index procedure)

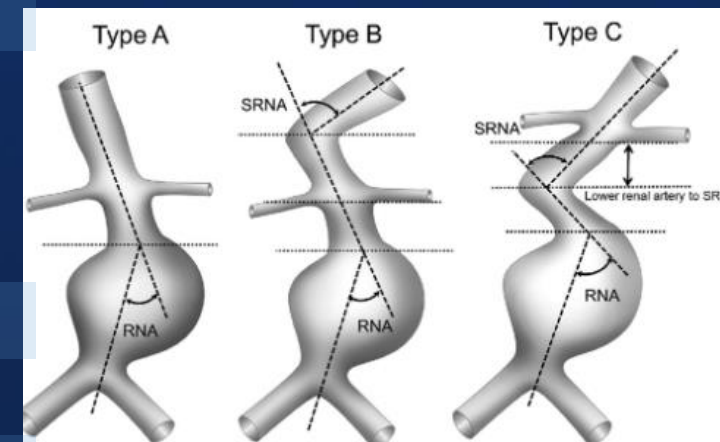
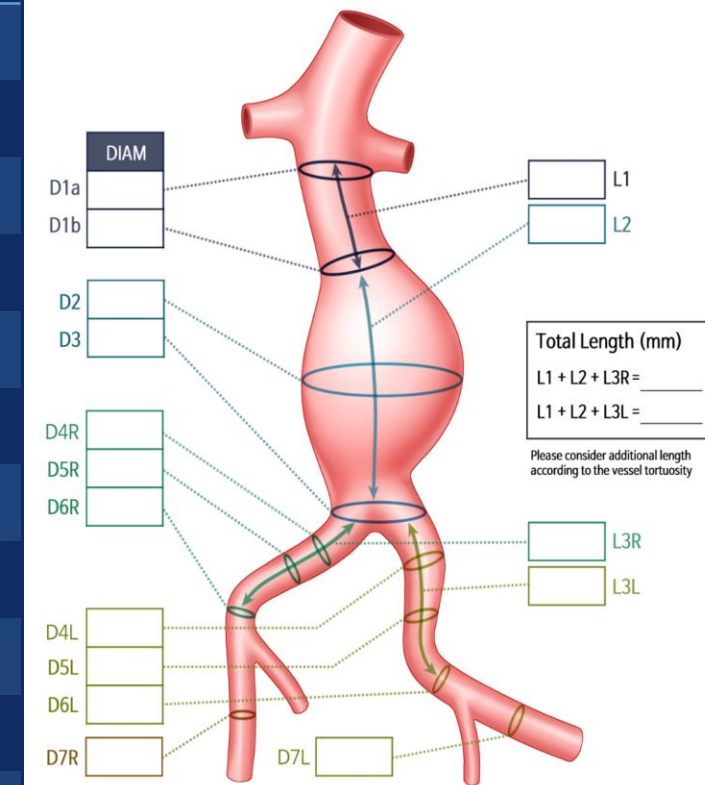


# Baseline Clinical Characteristics

	EAVR (n=860)	Surgery (N=718)	P value
Age, years	74.2 ± 7.2	68.6 ± 8.5	<0.001
Male	741 (86.2%)	633 (88.2%)	0.27
BMI	24.0 ± 3.4	24.4 ± 3.2	0.05
Risk factors			
Diabetes mellitus	178 (20.7%)	145 (20.2%)	0.85
Hypertension	576 (67.0%)	467 (65.0%)	0.45
Hyperlipidemia	243 (28.3%)	193 (26.9%)	0.46
Current smoker	151 (17.6%)	187 (26.0%)	0.001
Previous CABG	61 (7.1%)	36 (5.0%)	0.11
Previous PCI	166 (19.3%)	145 (20.2%)	0.60
Previous Stroke	93 (10.8%)	55 (7.7%)	0.04
CRF	43 (5.0%)	33 (4.6%)	0.80
Atrial fibrillation	48 (5.6%)	35 (4.9%)	0.61
LVEF	59.8 ± 7.6	60.5 ± 7.0	0.08
Tx Indication 1. Aneurysm	847 (98.5%)	661 (92.1%)	<0.001
2. Aorta rupture psuedoaneurysm	13 (1.5%)	57 (7.9%)	

	EAVR (n=860)	Surgery (N=718)	P value
Diameter			
<b>Neck</b>	<b>21.9 ± 3.3</b>	<b>24.2 ± 7.3</b>	<b>0.01</b>
Aneurysm diameter(max)	58.1 ± 12.9	62.3 ± 21.7	0.06
Right CIA	19.0 ± 9.3	19.8 ± 11.7	0.50
Left CIA	17.6 ± 8.7	17.7 ± 10.4	0.17
Length			
neck length	36.2 ± 15.5	35.1 ± 24.5	0.68
<b>Aneurysm length</b>	<b>84.9 ± 22.6</b>	<b>93.1 ± 33.3</b>	<b>0.02</b>
Right CIA	46.8 ± 17.6	47.0 ± 20.0	0.93
Light CIA	50.3 ± 18.9	49.6 ± 22.5	0.81
Neck thrombus			
<b>nil/mild</b>	<b>801 (93.1%)</b>	<b>355 (49.4%)</b>	<b>&lt;0.001</b>
moderate/severe	59 (6.9%)	363 (50.6%)	
<b>Short neck (&lt;20mm)</b>	<b>34 (4.0%)</b>	<b>130 (18.1%)</b>	<b>&lt;0.001</b>
Angled neck			
Angulation type (Type A)	521 (60.6%)	347 (48.3%)	
<b>Angulation type (Type B/C)</b>	<b>303 (35.2%)</b>	<b>355 (49.4%)</b>	

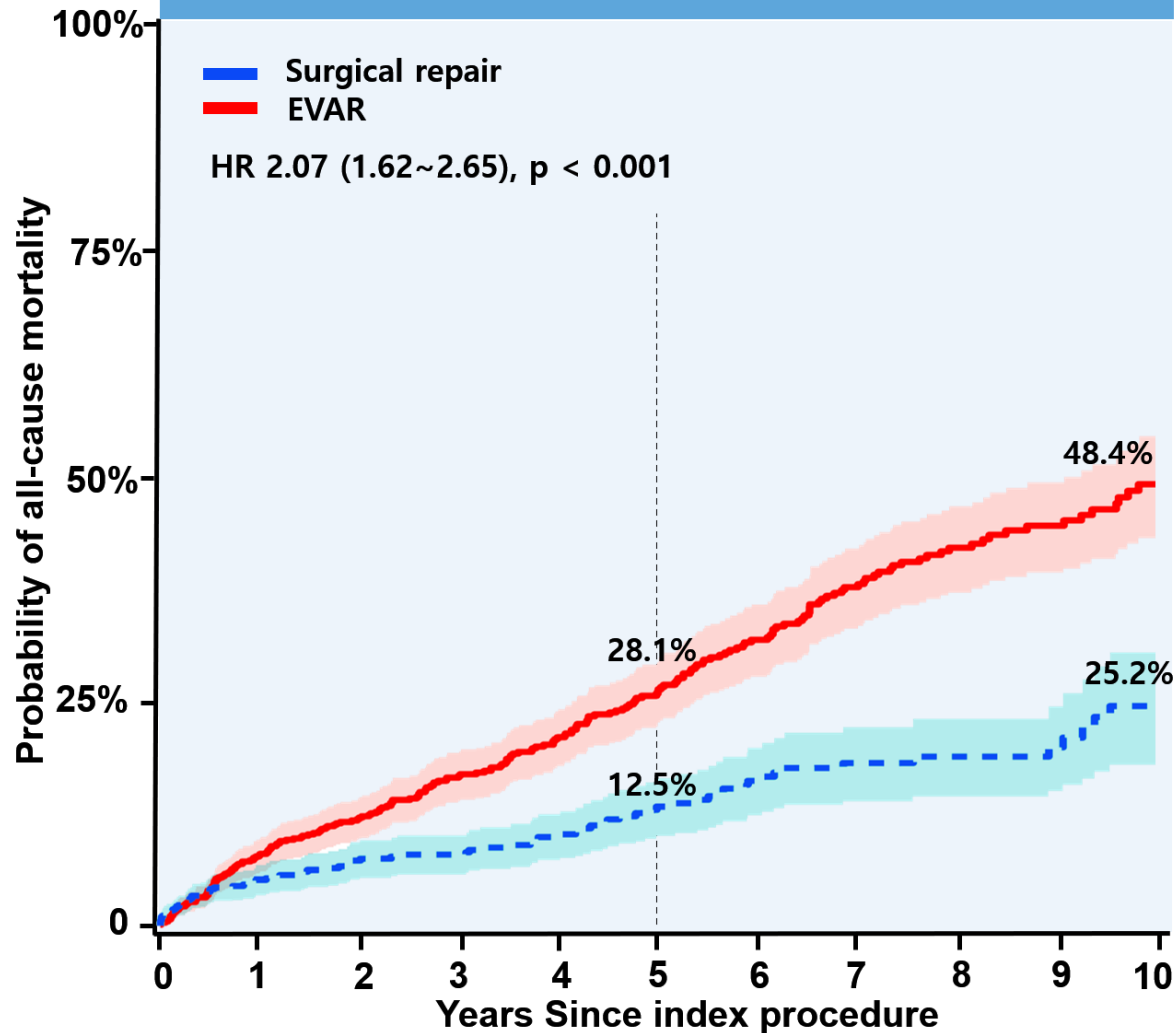
# CT finding



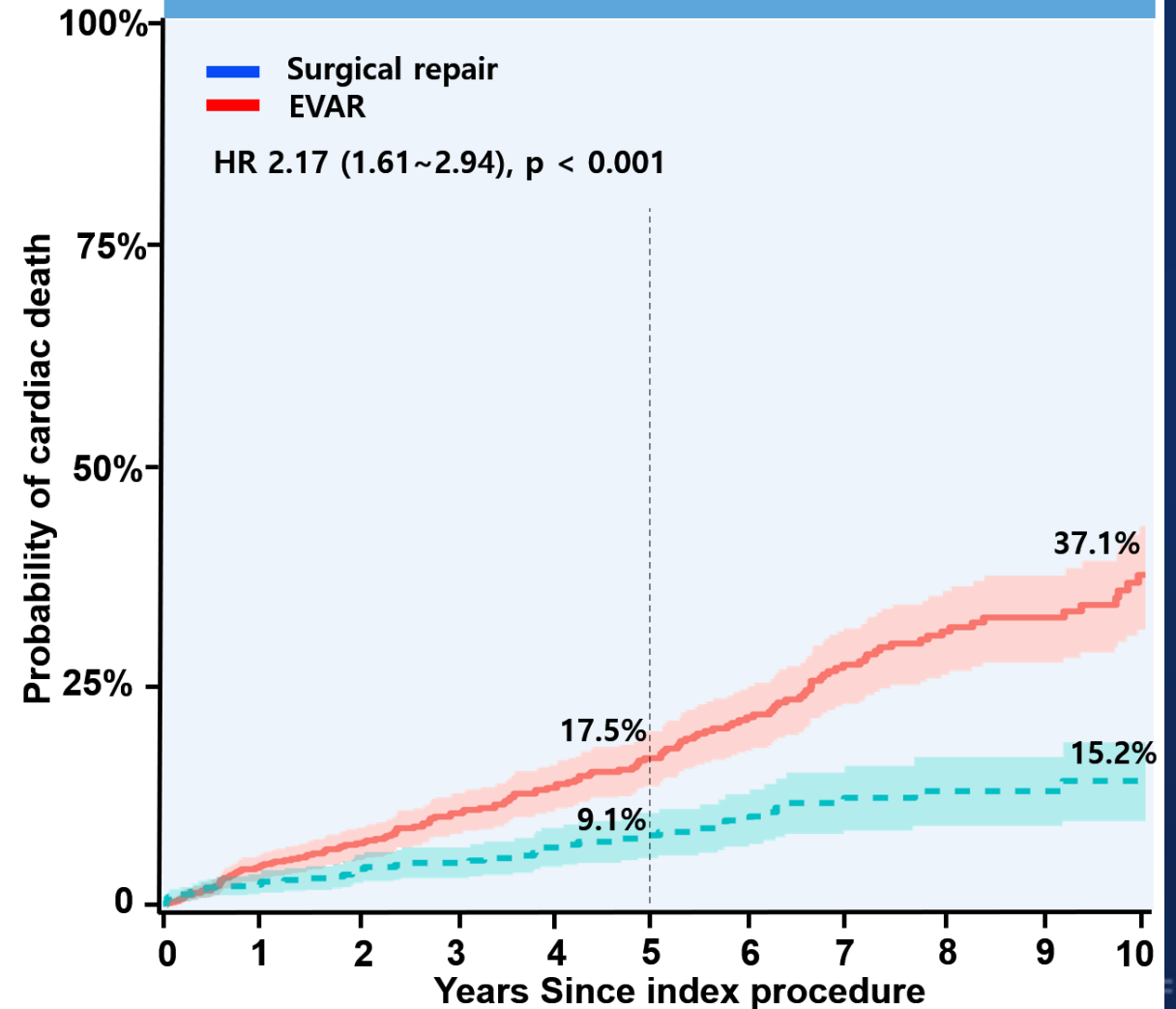
# Long-term outcome (10 years)\_mortality

F/u duration: EVAR (median 3.4yrs, IQR 1.0~6.1 yrs)  
Surgery (median 2.9 yrs, IQR 1.1~6.0 yrs)

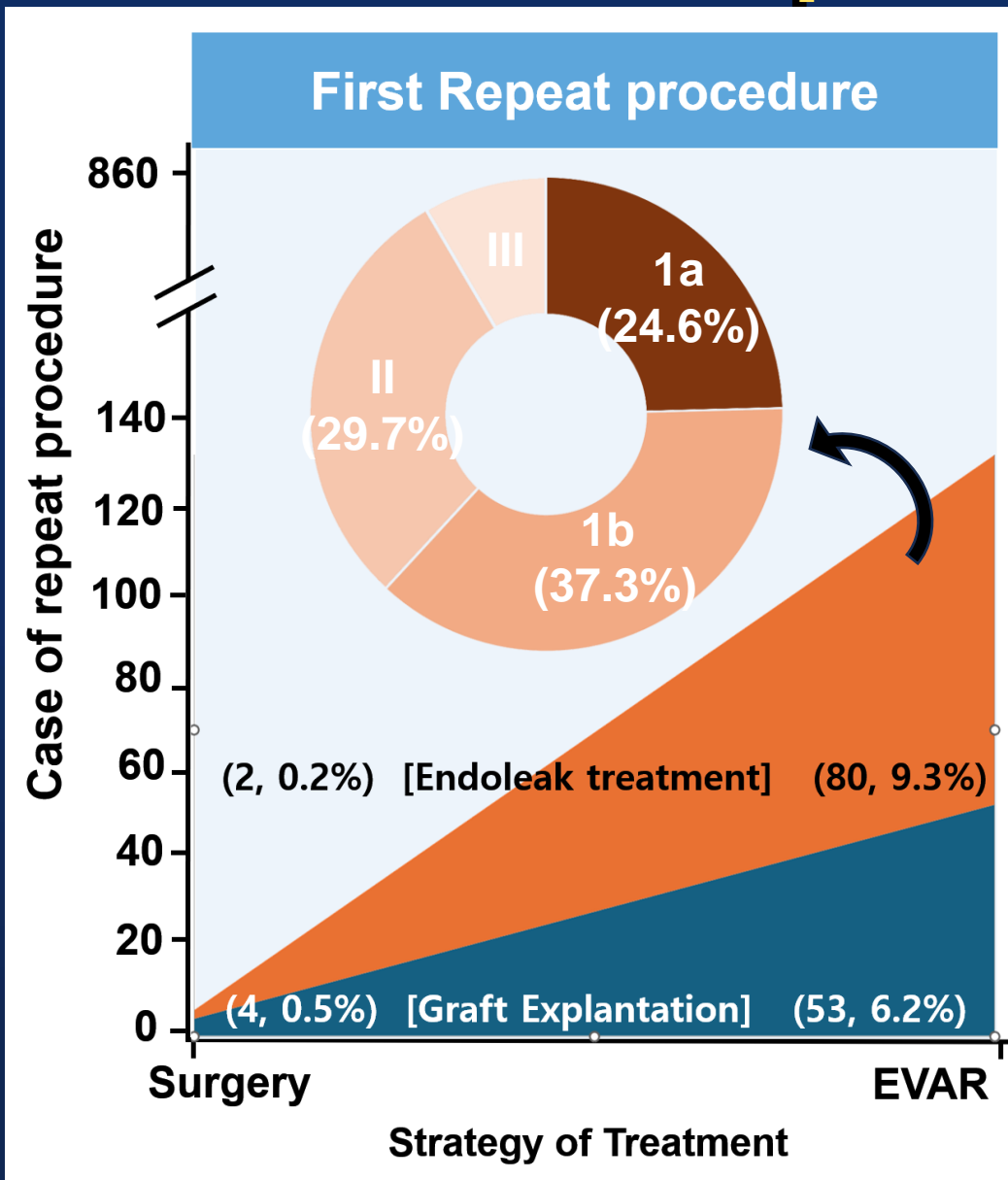
## A. 10-year all-cause mortality (crude)



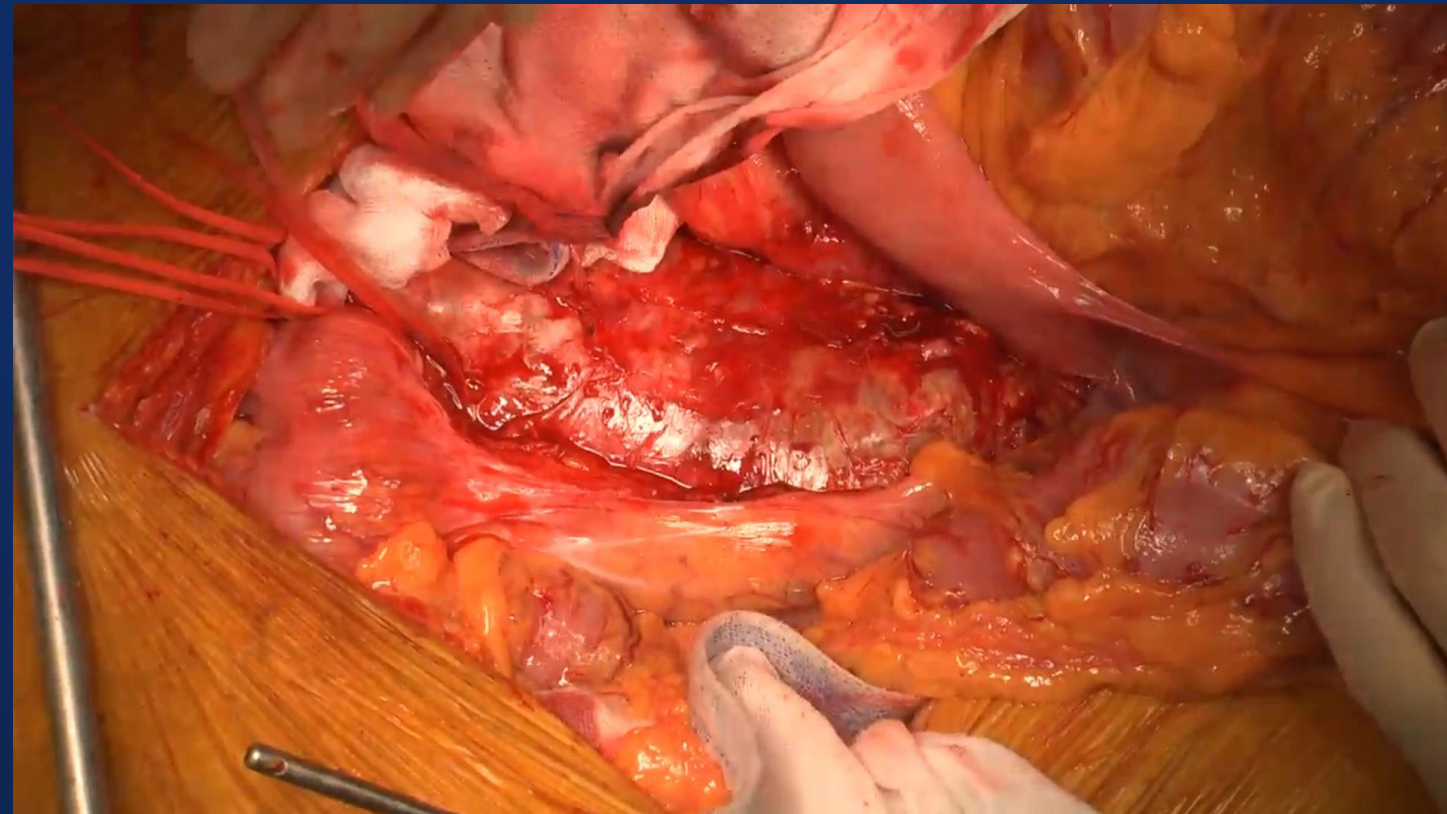
## B. 10-year cardiac death (crude)



# EVAR vs open repair for AAA (May 07~Sep 23)

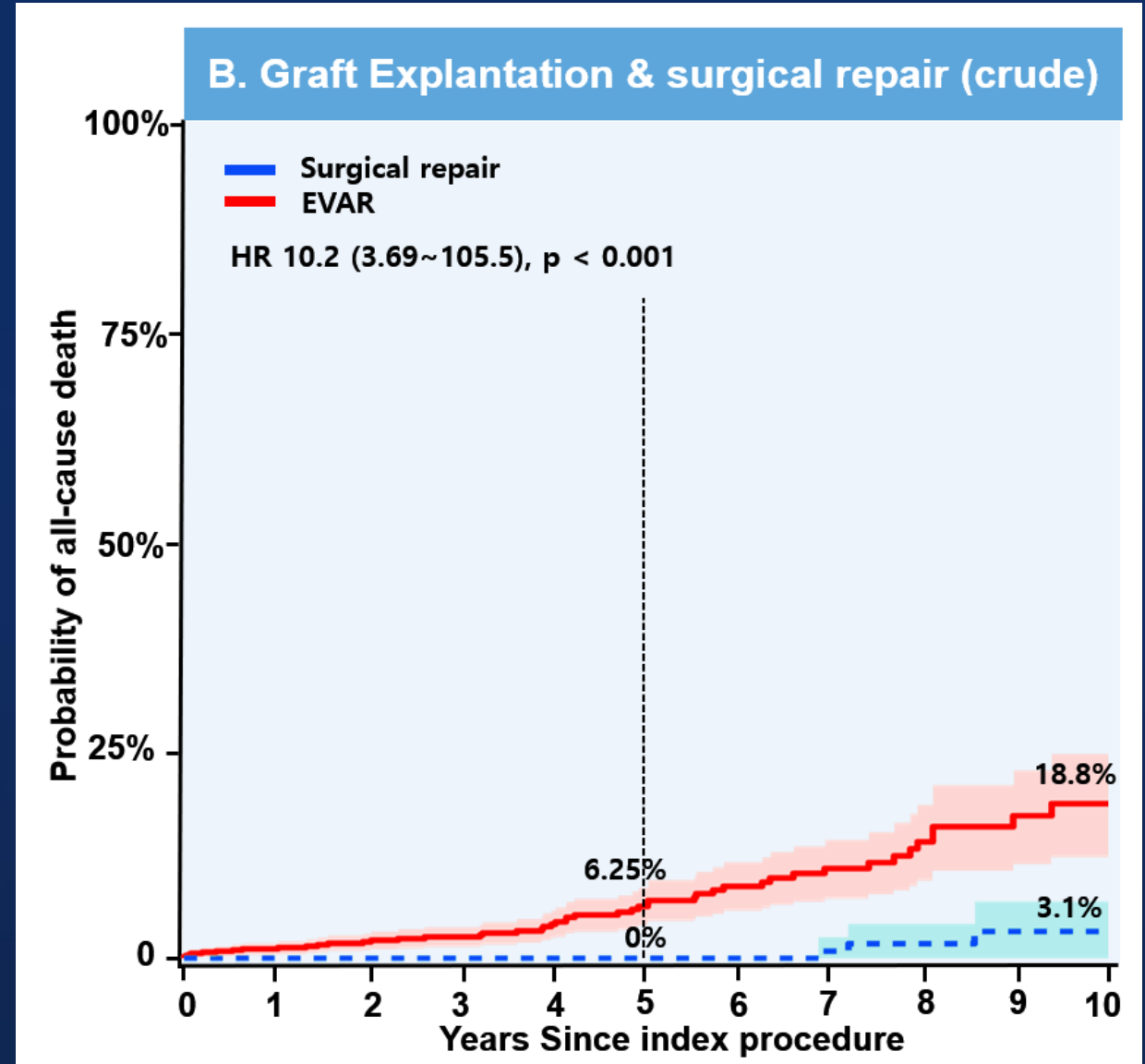
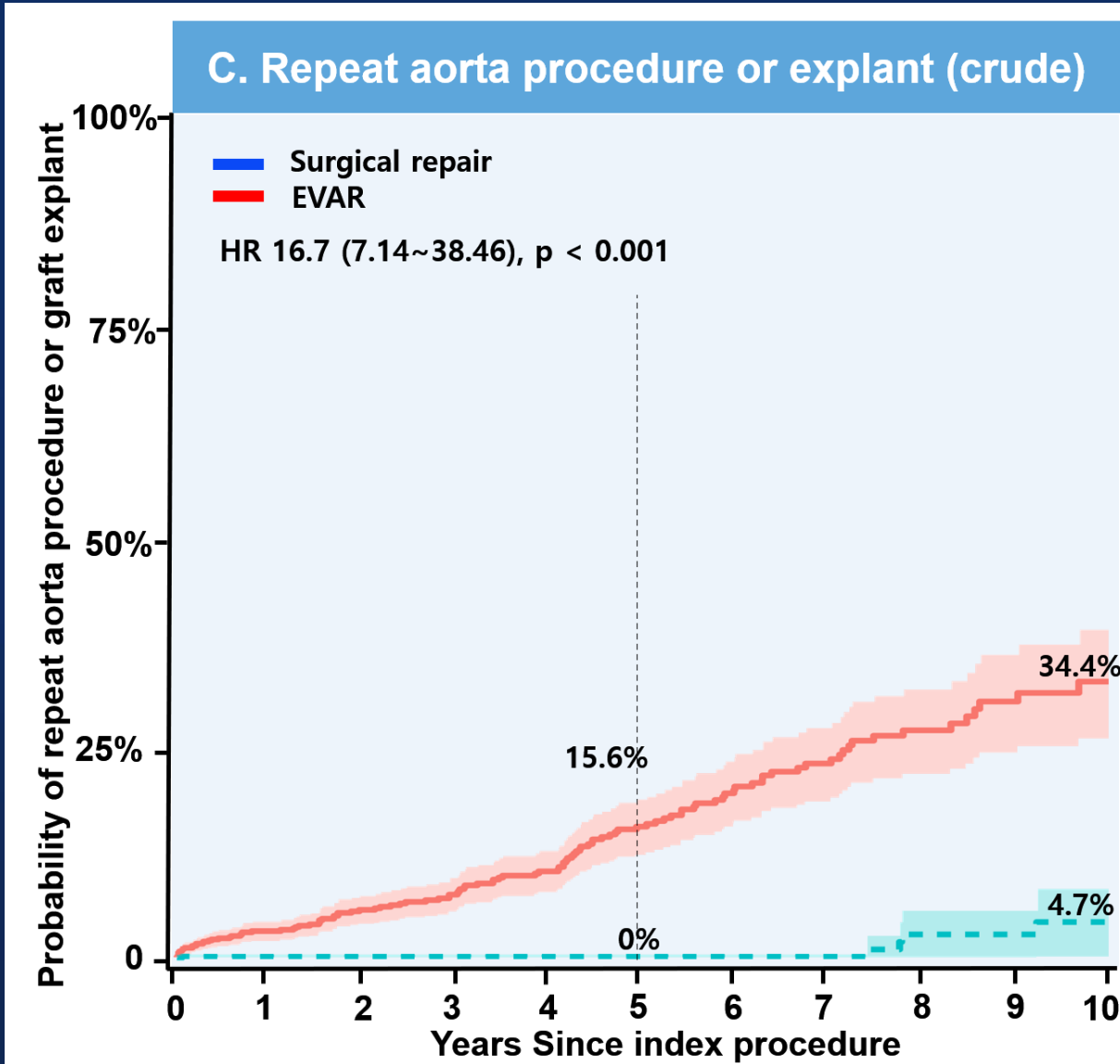


Graft explantation & surgical repair



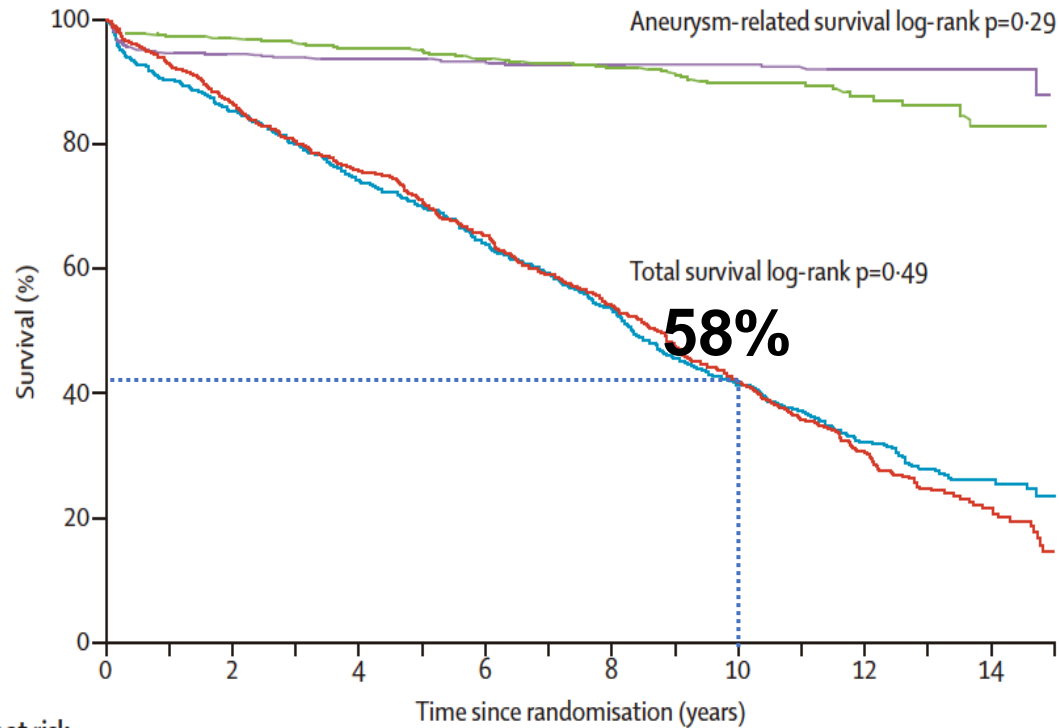


# Long-term outcome (10 years)\_repeat procedure



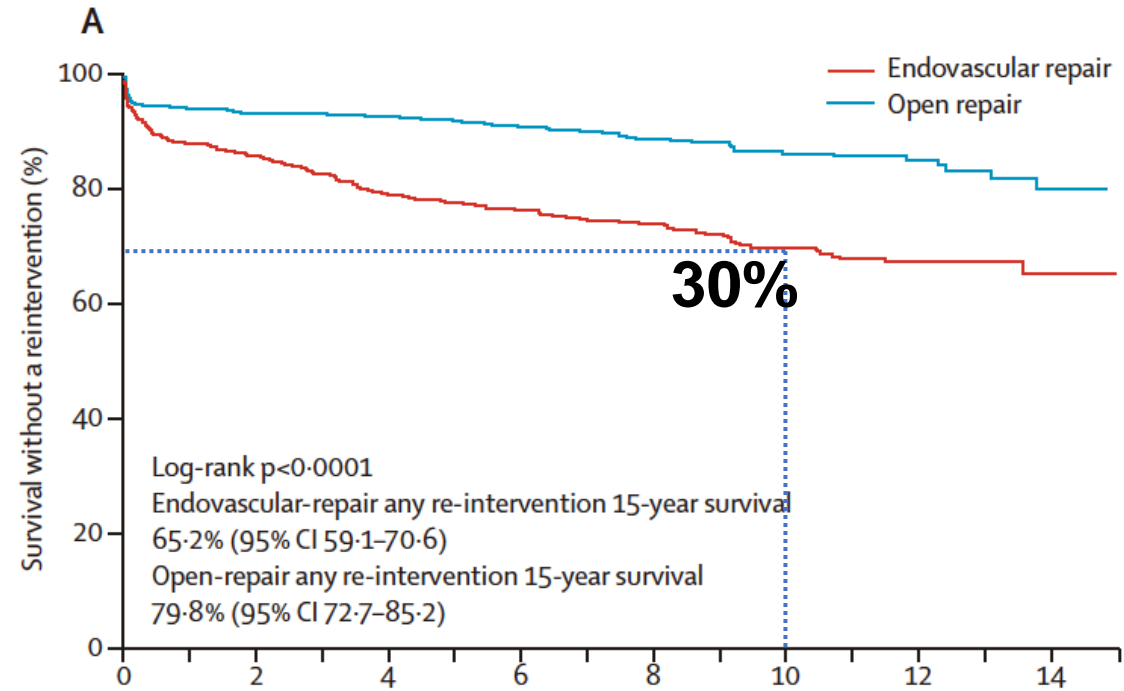
# Compared with Previous study

## All-cause mortality



Number at risk	0	2	4	6	8	10	12	14
Endovascular repair	626	543	474	409	339	263	135	41
Open repair	626	534	464	399	333	257	143	50

## Re-intervention



Number at risk	0	2	4	6	8	10	12	14
Endovascular repair	626	469	381	323	264	192	90	28
Open repair	626	506	436	357	282	214	112	35

# Summary

At Asan Medical Center during 2005~2024,

TEVAR is performed approximately 10-12 cases/year.

*For zones 2-4 TEVAR*, it is performed safely and non-invasively in patients with DTA lesions

EVAR is performed approximately 60~65 cases/year.

*For EVAR*, higher mortality and repeat interventions we observe  
(prioritize surgical treatment, yet, for high-risk, select patients, EVAR serves)