



Outcome of Endovascular Treatment for Infected Aortic Aneurysm

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Background

- Infected aortic aneurysm is a rare and life-threatening condition.
- Over the last decade, endovascular repair has become an accepted alternative treatment for high surgical risk patients.
- In Thailand, there is a notable lack of long-term follow-up data.





Objectives

Primary objective

- To evaluate the **5-year survival** of patients with infected aortic aneurysms who were treated with endovascular repair

Secondary objectives

- To study complications and reintervention rate
- To study hospital mortality



Study design

- Retrospective study
- Single center, operated at Siriraj hospital, Bangkok, Thailand
- January 2010 - December 2017

Inclusion

- Patients with infected aortic aneurysm underwent endovascular repair

Exclusion

- Presented with free rupture
- Intraoperative conversion to open surgery

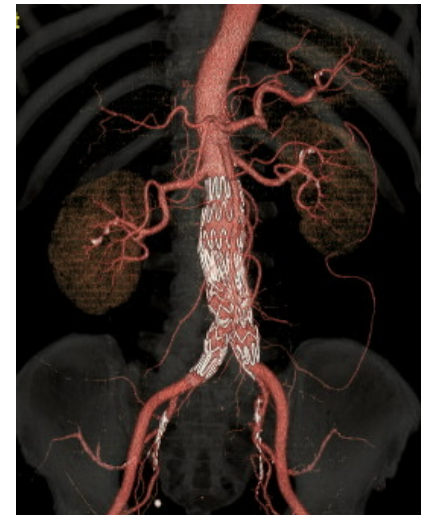


Study design

Endovascular
treatment = 67

TEVAR = 10

EVAR = 57



Statistical analysis

- **Continuous variables:** Mean \pm standard deviation or median (IQR)
- **Categorical variables:** frequency and percentages
- **Cumulative survival:** Kaplan-Meier method.
- **Predictors of all-cause mortality:** Cox regression
- **Threshold for significance** $\rightarrow p < 0.05$



Diagnosis

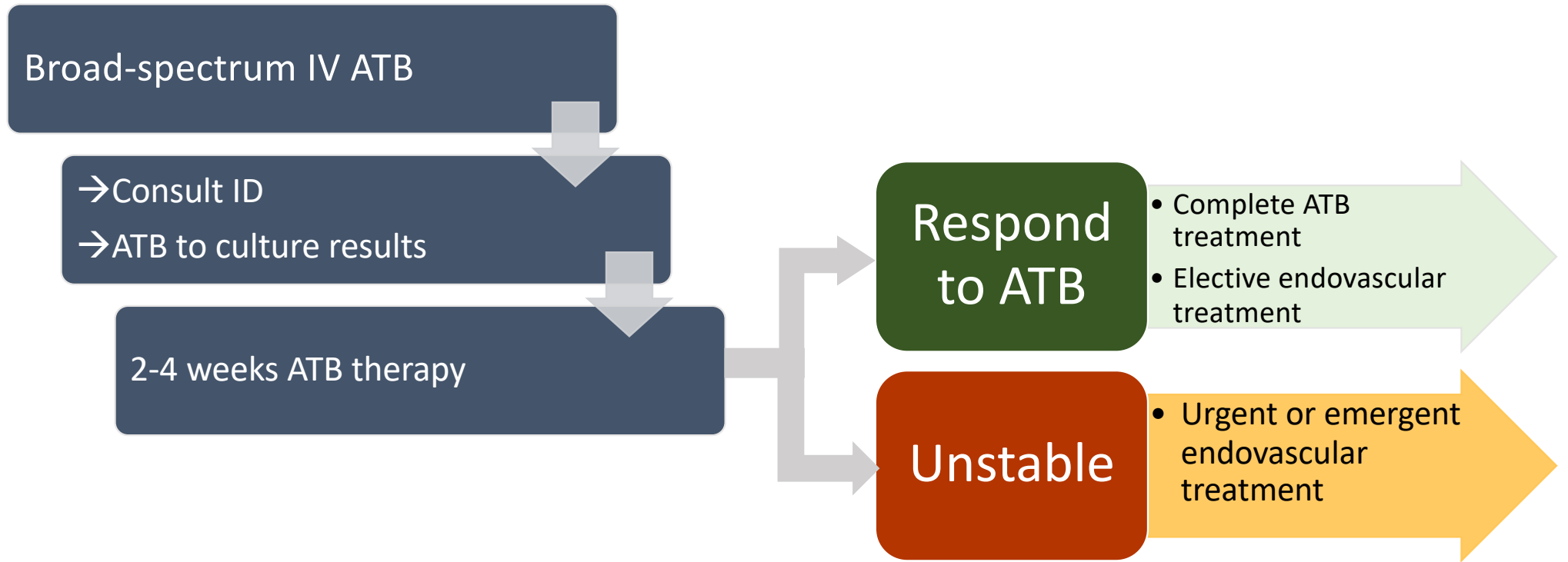
Clinical evidence of infection

- Fever
- Localized pain
- Leukocytosis
- Inflammatory markers elevation

Characteristic imaging

- Para-aortic soft tissue infiltration
- Adjacent accumulation of blood, fluid, or gas

Management





Follow up imaging

- CTA at 1, 6, and 12 months, and yearly.



Result

Patient's characteristics	N (%)
Mean age y (range)	69 (18-94)
Female	51 (76)
Underlying conditions	
Hypertension	45 (67)
Dyslipidemia	22 (33)
Diabetes mellitus	21 (31)
CKD (creatinine: > 2 mg/dL)	15 (22)
Ischemic heart disease	12 (18)
Smoking	11 (16)
COPD	7 (10)
CHF	5(7.5)



Result

Clinical characteristics

N (%)

Pre-operative manifestations

CRP level

5-100 mg/L

38 (57)

> 100 mg/L

29 (43)

WBC (> 10,000 /mL)

45 (67)

Pain

53 (79)

Fever

31 (46)

GI bleeding

6 (9)

Hemoptysis

1 (1.5)

Prior ATB (> 48 h prior to OR)

38 (57)

Prior Surgery

12(18)

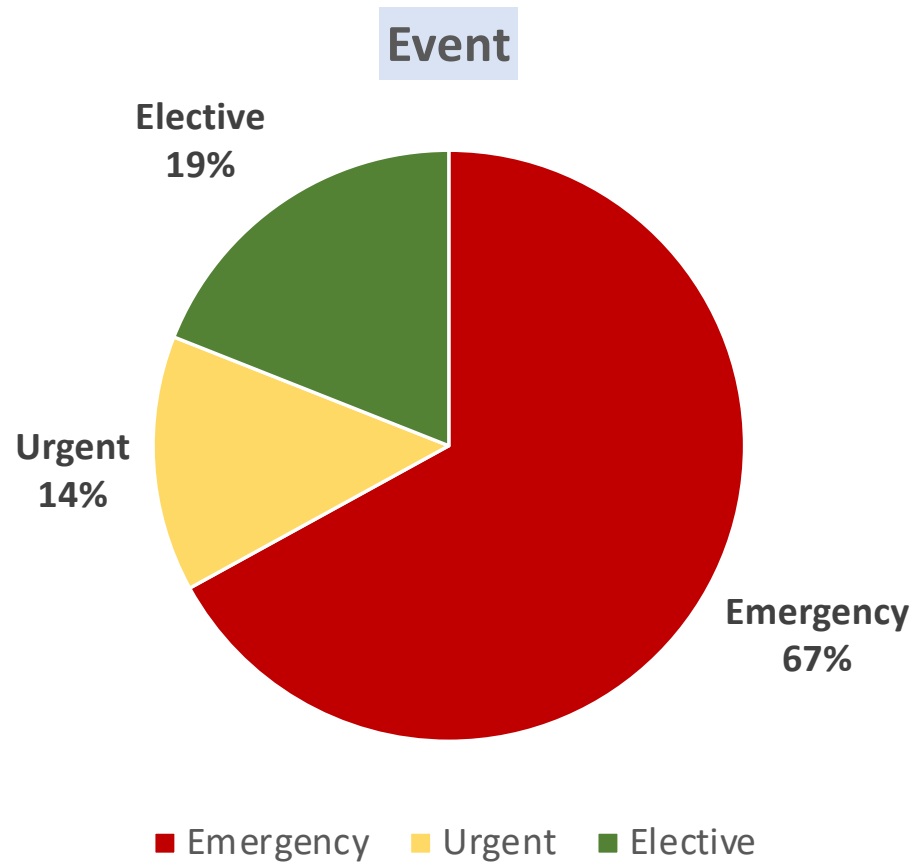


Result

Clinical characteristics (cont.)	N (%)
Pathogen	
Salmonella species	8 (12)
Staphylococcus species	8 (12)
Streptococcus species	7 (10)
Culture negative	37 (55)
Other	7 (10)
Aneurysm location	
Descending	9 (13)
Para-visceral	6 (9)
Infrarenal	40 (60)
Multiple	7 (10)
Aneurysm characteristics	
Saccular	58 (86)
Periaortic infection	4 (6)
Fistula	4 (6)



Result



Result

Operative characteristics	N (%)
Operation	
TEVAR	10 (15)
EVAR	57 (85)
Post-operative complications	
Respiratory	16 (24)
Renal insufficiency	11 (16)
GI complication	7 (10)
Cardiovascular	4(6)
CVA	3 (5)
Limb ischemia	3 (5)



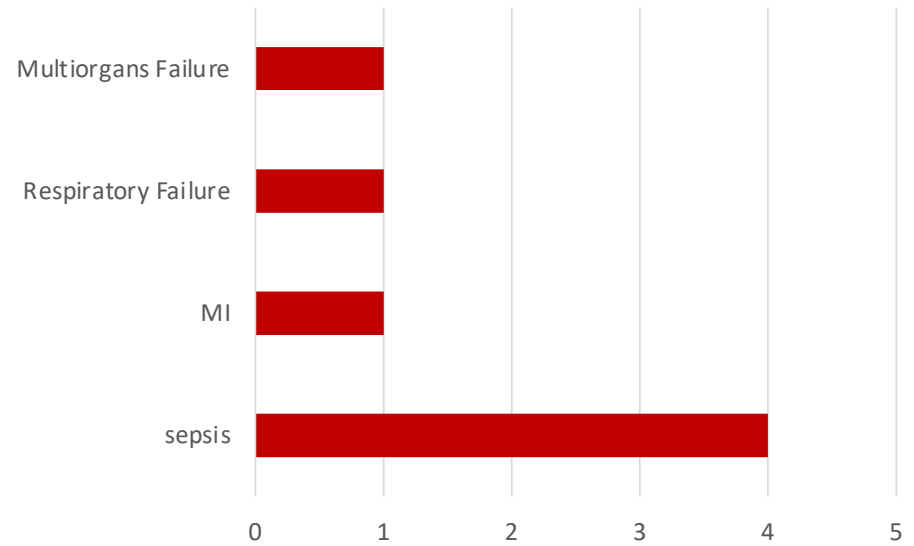
Result

Operative characteristics (cont.)	N (%)
Persistent infection	44 (66)
Blood stream/ recurrent infection	30 (45)
Aortic Endograft Infection (AEI)	14 (21)
Reintervention cause	20 (30)
Aorto-enteric fistula	6 (9)
Graft infection	4 (6)
New/residual infected aortic aneurysm	4 (6)
Limb ischemia	3 (5)
Endoleak	3 (5)
Reintervention procedure	20 (30)
Open	12 (18)
Endovascular	8 (12)



Result

• In-hospital mortality 7 (10%)



• Median follow-up 29 months (5 days - 142 months)



Result

Complications	Total n =67	TEVAR n= 10	EVAR n=57
	N (%)	N (%)	N (%)
Graft infection	11 (16)	1 (10)	10 (17)
Reintervention	20 (30)	4 (40)	16 (28)
Open	12 (18)	2 (20)	10 (17)
Endovascular	8 (12)	2 (20)	6 (11)
Death	18 (27)	3 (30)	16 (28)



Long-term mortality

Factors	HR (95%CI)	p-value
Demographic and clinical characteristics		
Female	1.66 (0.40-6.86)	0.485
Age > 75	3.25 (0.95-11.2)	0.061
CHF	0.43 (0.04-4.50)	0.876
CKD	0.43 (0.04-4.50)	0.482
Pre-operative manifestations		
Fever	0.37 (0.09-1.51)	0.165
Complications		
Cardiovascular	1.33 (0.18-9.95)	0.782
Respiratory	5.02 (0.51-49.5)	0.167
Limb ischemia	2.91 (0.15-55.2)	0.477
Persistent infection	5.56 (1.11-27.9)	0.037

Persistent infection

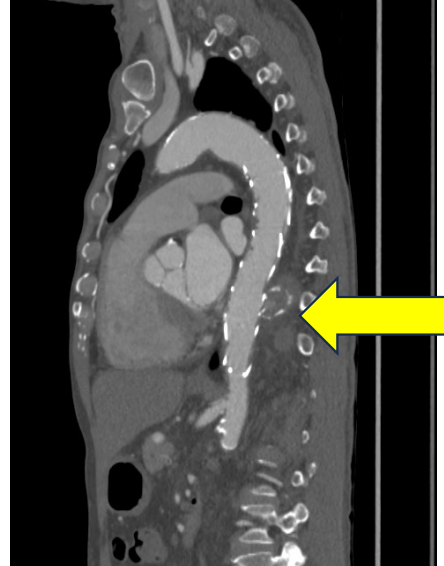
Factors	HR (95%CI)	p-value
Preoperative manifestation		
CRP>100	1.65(0.47-5.85)	0.435
Prior ATB	0.56(0.15-2.17)	0.403
Event		
Elective surgery	1.66(0.33-8.49)	0.542
Emergency surgery	0.90(0.19-4.25)	0.898
Hemoculture positive	3.59(0.95-13.6)	0.059
Aneurysm characteristics		
Periaortic infection	1.68(0.13-22.1)	0.694
Fistula	3.02(0.25-35.9)	0.381
Reintervention	2.38(0.52-10.8)	0.261

Case I: Descending thoracic aortic aneurysm

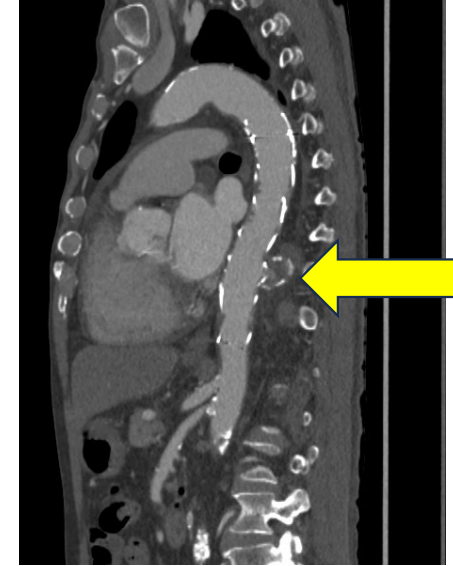
Preop CTA



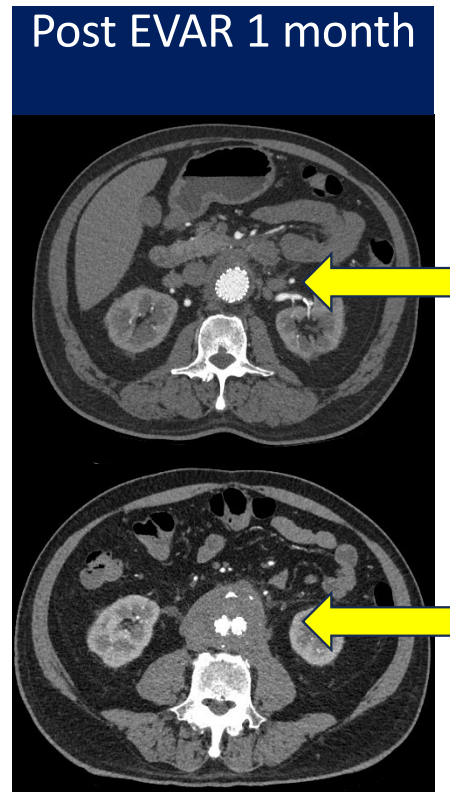
Post TEVAR 1 month



Post TEVAR 6 months

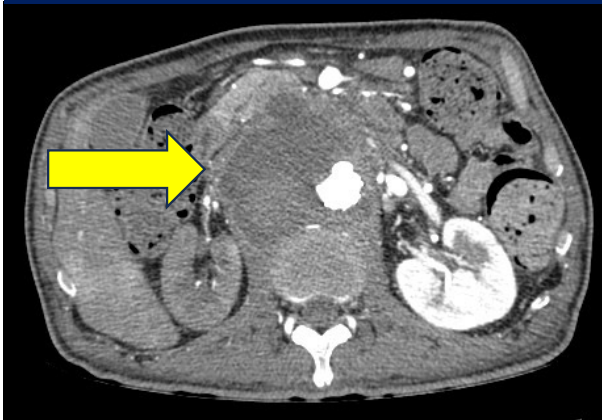


Case II: Infected AAA

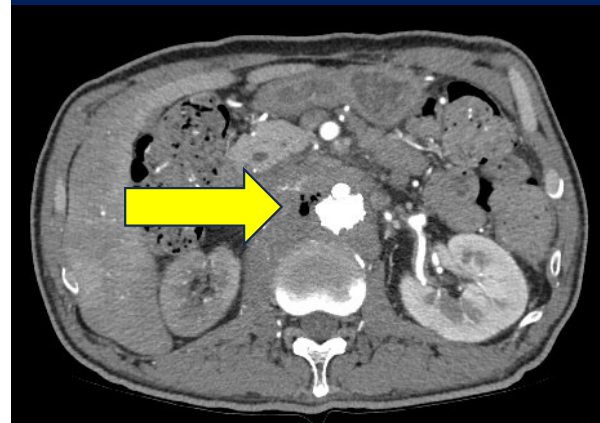


Case III: Infected AAA

Post EVAR 1 month



Post EVAR 6 months

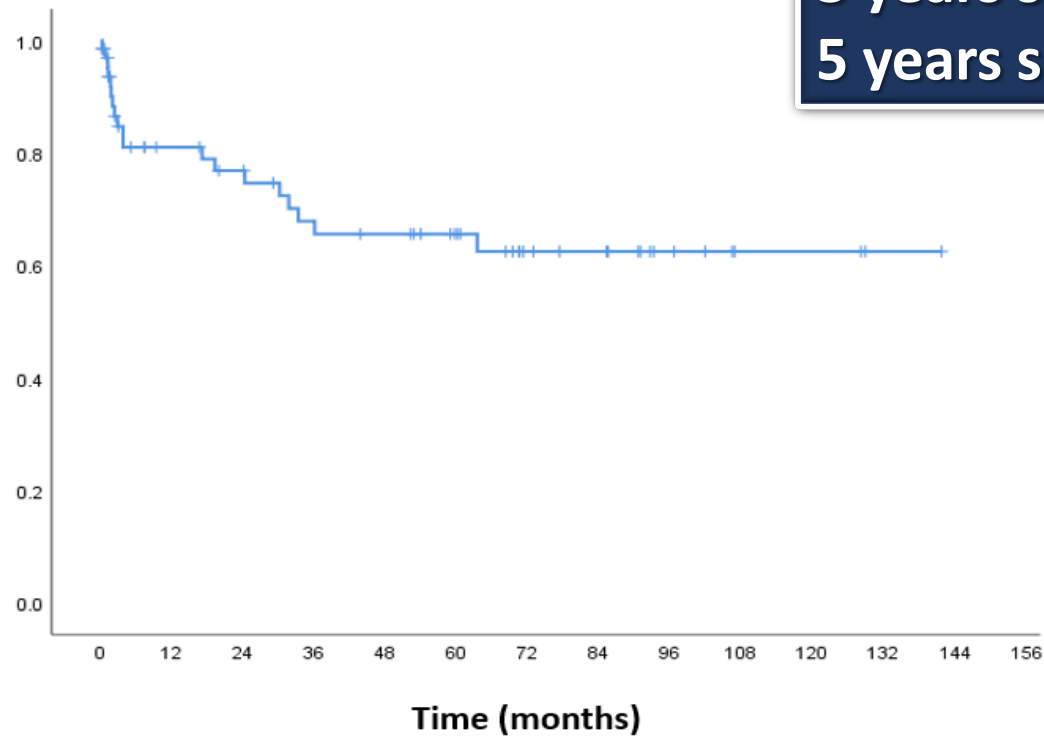


Air around aortic graft

conversion

Long-term survival

Survival probability



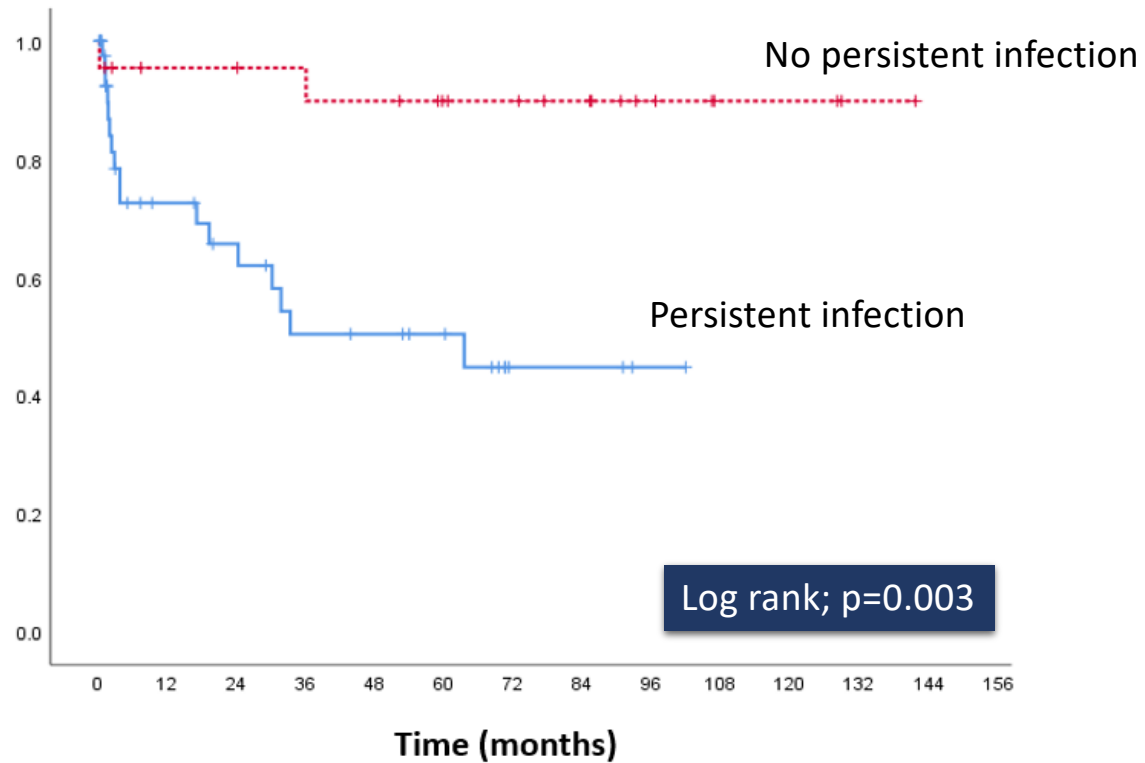
3 years survival 68 %
5 years survival 63 %



Long-term survival

At 5 years
No infection; survival 90 %
Persistent infection; survival 45 %

Survival probability





Limitations

- Retrospective nature
- The limited number of patients
- The single-center design



Conclusion

- Endovascular repair for infected aortic aneurysm is a feasible treatment with **acceptable perioperative mortality**.
- **Long-term survival** is significantly impacted by **persistent infection**.
- **Reinterventions** are frequently required, often involving **open repair**.

