



IX Congresso
Novas Fronteiras
em Medicina
Cardiovascular

22 a 24 de Fevereiro 2019

The Village Praia
D'El Rey - Óbidos


DEPARTAMENTO
CORACÃO e VASOS
CIRURGIA VASCULAR


HOSPITAL DE
SANTAMARIA

Emergent treatment of aortoesophageal and aortobronchial fistulae: is there a place for TEVAR?

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Óbidos, 23 Fevereiro 2019

MANAGEMENT of Aorto-Esophageal and Aorto-Bronchial Fistulae

Aorto-Esophageal Fistulae (AEF) and Aorto-Bronchial Fistulae (ABF):

- ✓ rare
- ✓ lethal if untreated
- ✓ dual physiopathology:
 - hemorrhage (acute)
 - infection (midterm)

MANAGEMENT of Aorto-Esophageal and Aorto-Bronchial Fistulae

AEF  **ABF**

Causes

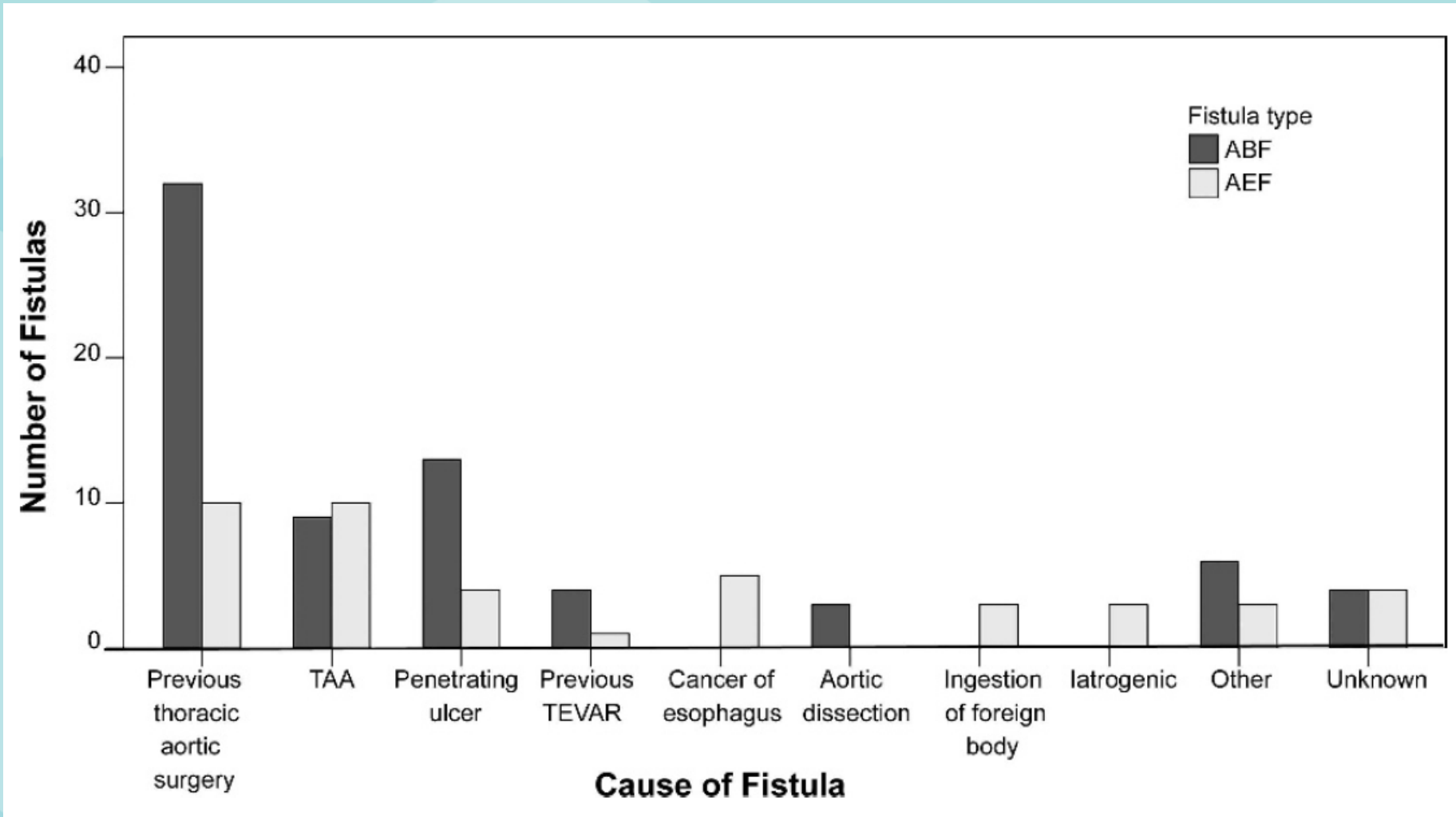
Physiopathology

Clinical presentation

Treatment

Outcome

CAUSES of Aorto-Esophageal and Aorto-Bronchial Fistulae



Jonker, J Endovasc Ther. 2009

DEMOGRAPHICS AND PRESENTATION

Demographics and Presentation		
Variable	ABF (n=71)	AEF (n=43)
Age, y	64 ±1.8	62 ±2.5
Male gender	48 (69%)	28 (68%)
Presentation		
Hemoptysis	59 (91%)	0 (0%)
Hematemesis	0 (0%)	33 (77%)
Thoracic pain	1 (2%)	9 (21%)
Dyspnea	5 (8%)	1 (2%)
Dysphagia	0 (0%)	6 (15%)
Acute presentation	46 (65%)	41 (95%)
Hypovolemic shock	9 (13%)	14 (33%)
Systemic infection*	6 (9%)	15 (36%)
Diagnosis		
CTA	34 (48%)	23 (53%)
Angiography	12 (17%)	8 (19%)
Esophagoscopy	—	5 (12%)
Bronchoscopy	5 (7%)	—
Other†	8 (13%)	3 (7%)
Missing	12 (17%)	4 (11%)
TEVAR within 24 hours of diagnosis	46 (65%)	35 (81%)

Jonker, J Endovasc Ther. 2009

TREATMENT of Aorto-Esophageal and Aorto-Bronchial Fistulae

Conservative	Open surgery	TEVAR	TEVAR followed by planned conversion
Uniformly fatal	High mortality rates AEF - 45-55% ABF - 15-24% Emergent procedure: bleeding, sepsis Patient comorbidities Adhesions (infection / previous surgery) Aortic clamping / cardiopulmonary bypass	Infection Fistula recurrence	Bridging to surgery

OUTCOMES of TEVAR for Aorto-Esophageal and Aorto-Bronchial Fistulae

Variable	ABF (n=71)	AEF (n=43)
Technical success of TEVAR	64 (90%)	39 (91%)
In-hospital death	2 (3%)	8 (19%)
In-hospital complications*	7 (10%)	6 (14%)
Sepsis and/or mediastinitis	1 (1%)	2 (5%)
Pulmonary complications	2 (3%)	1 (2%)
Renal failure	1 (1%)	2 (5%)
Paraplegia	0 (0%)	1 (2%)
Myocardial infarction	1 (1%)	0 (0%)
Iliac artery rupture	2 (3%)	0 (0%)
Endoleak†	11 (16%)	2 (5%)
Additional open thoracic surgery within 30 days	2 (3%)	16 (37%)
Additional thoracic procedures after 30 days	1	3
Esophageal surgery	0	15
Mediastinal drainage	1	4
Enterostomy	0	5
Coloplasty	0	4
Intercostal muscle flap	0	2
Lobectomy	2	0
Thoracic aortic re-intervention within 30 days	6 (9%)	5 (12%)
Thoracic aortic re-interventions after 30 days	10	3
Second TEVAR	13	2
Open thoracic aortic surgery‡	2	6
Transposition of LSA	3	0

Jonker, J Endovasc Ther. 2009

OUTCOMES of TEVAR for Aorto-Esophageal and Aorto-Bronchial Fistulae

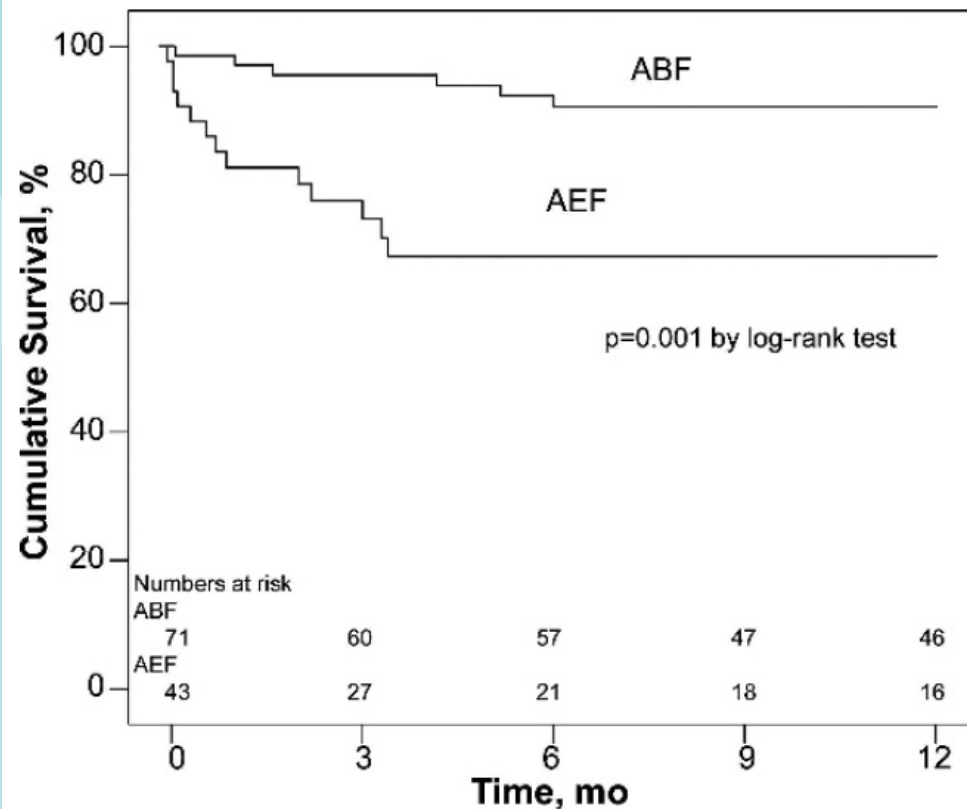


Figure 4 ♦ Fistula-related mortality during the first year after TEVAR for ABF and AEF.

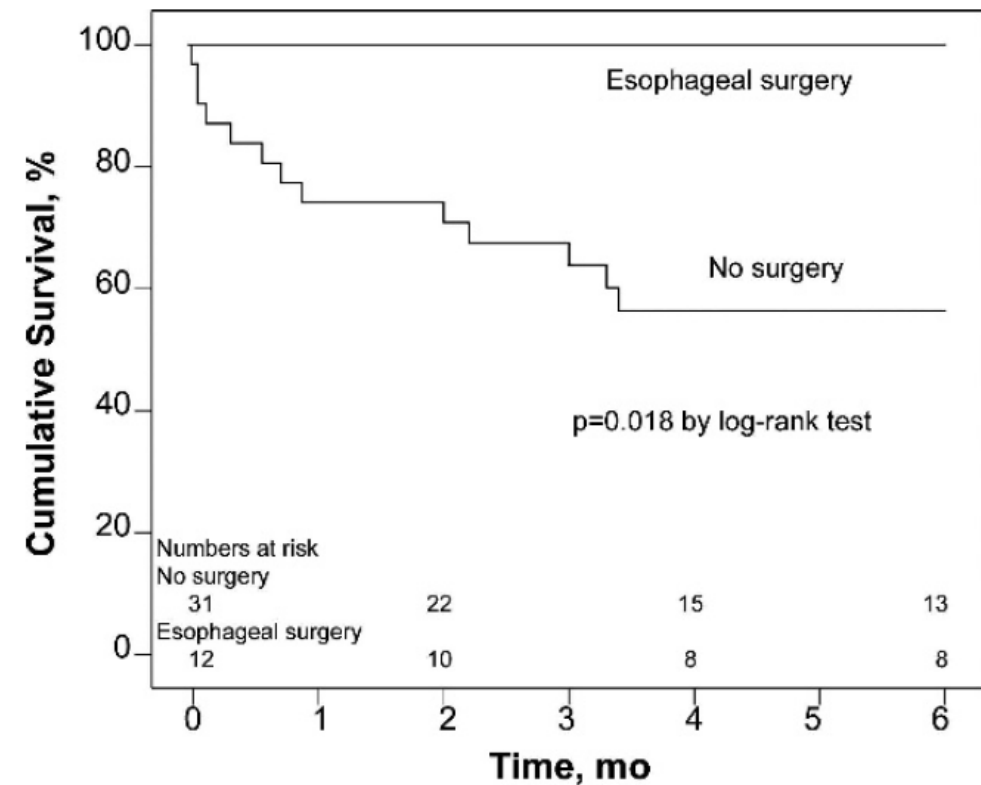


Figure 5 ♦ Survival of AEF patients with and without additional esophageal surgery within 30 days after TEVAR.

OUTCOMES of TEVAR for AEF and ABD - DIFFERENCES

	AEF	ABF
Previous thoracic aortic surgery	<25%	>50%
In-hospital death	19%	3%
Fistula related death @ 1 year	35%	10%
Additional open thoracic surgery within 30 days	37%	3%
Death @ 6 months	No esophageal surgery – 40% Esophageal surgery – 0%	-
Thoracic endograft replacement	12%	0%

Jonker, J Endovasc Ther. 2009

OUTCOMES of TEVAR for AEF and ABD - DIFFERENCES

The risk factors for in-hospital mortality were hemodynamic instability on admission, sepsis, and conservative management. Infectious and malignant etiologies resulted in the worst prognosis.

Mosquera, J Thorac Cardiovasc Surg 2014

Prolonged antibiotic treatment and repair of AEFs due to a foreign body were associated with a significant lower aortic mortality

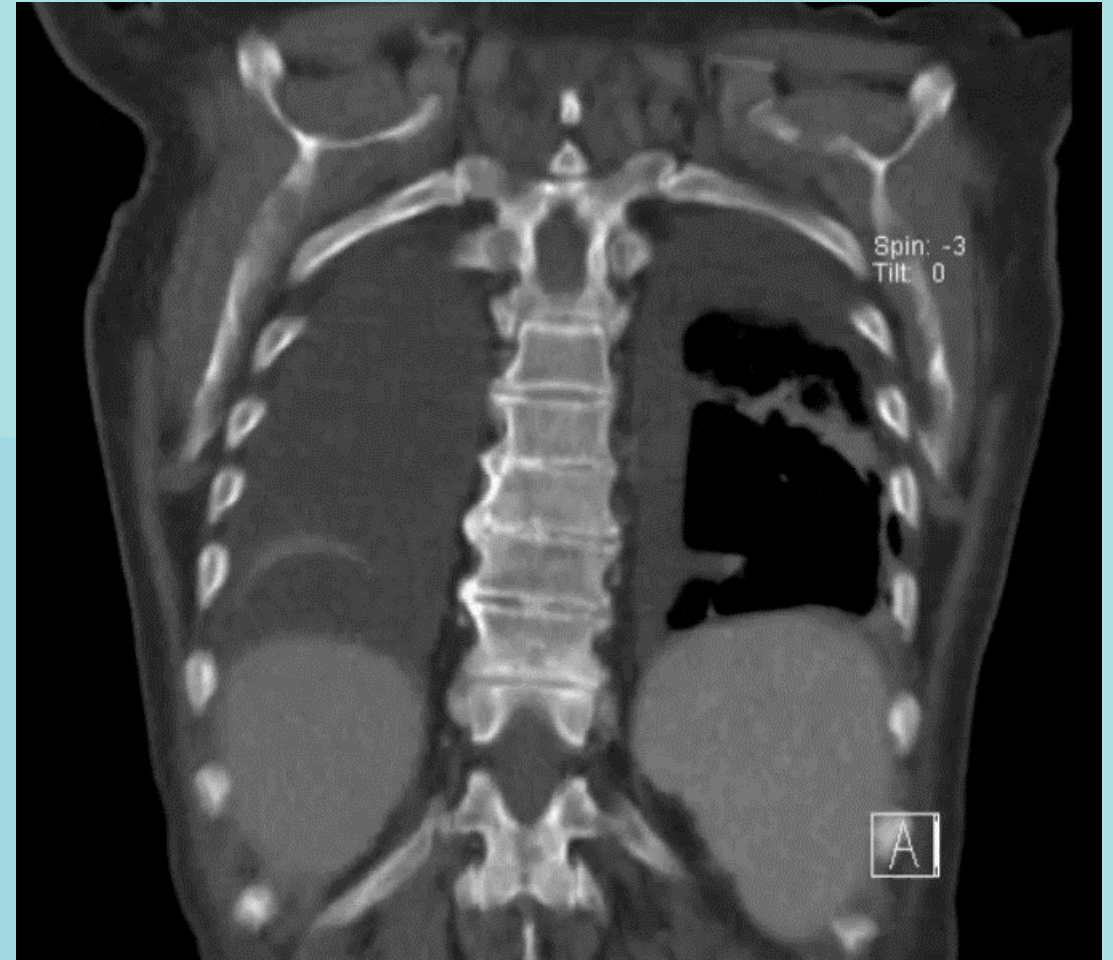
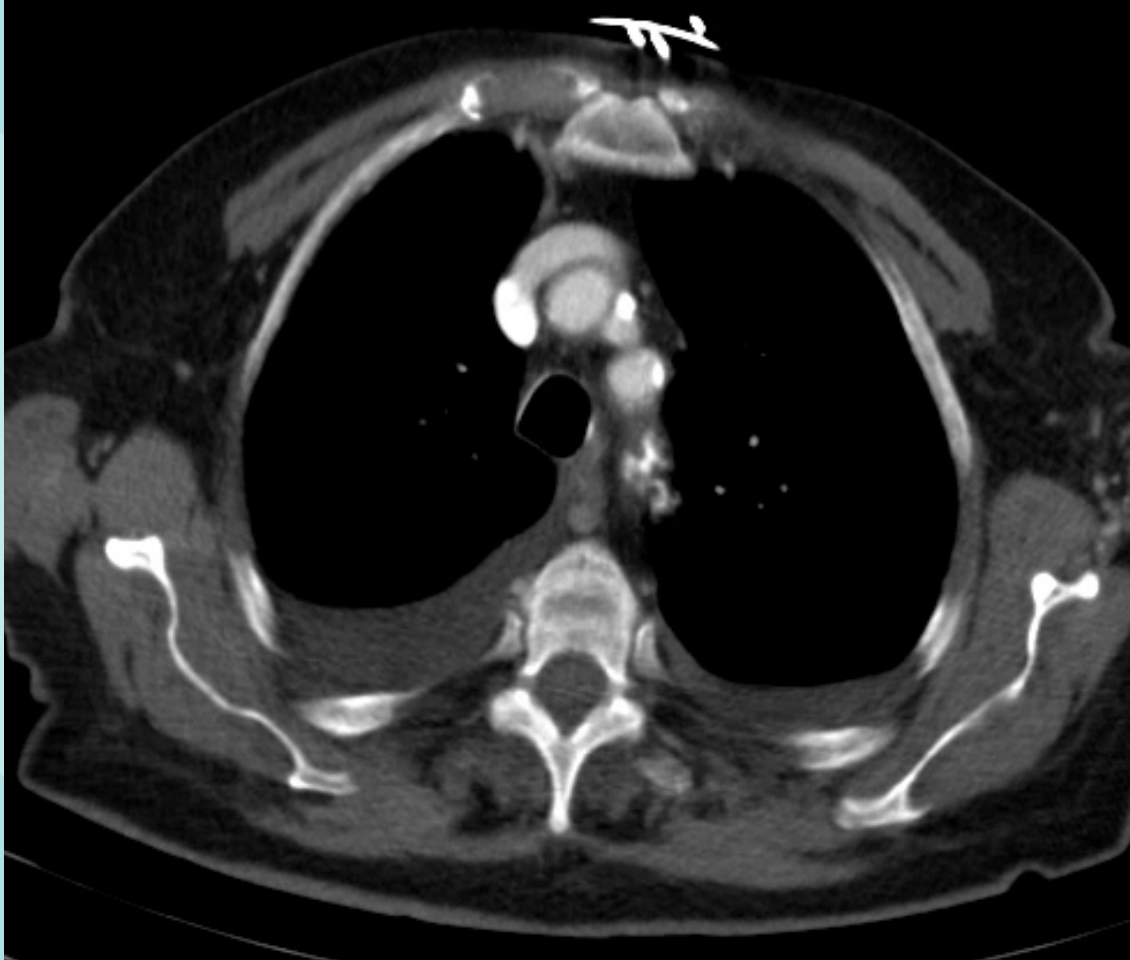
Canaud, J Vasc Surg 2014

Aorto-Esophageal Fistulae

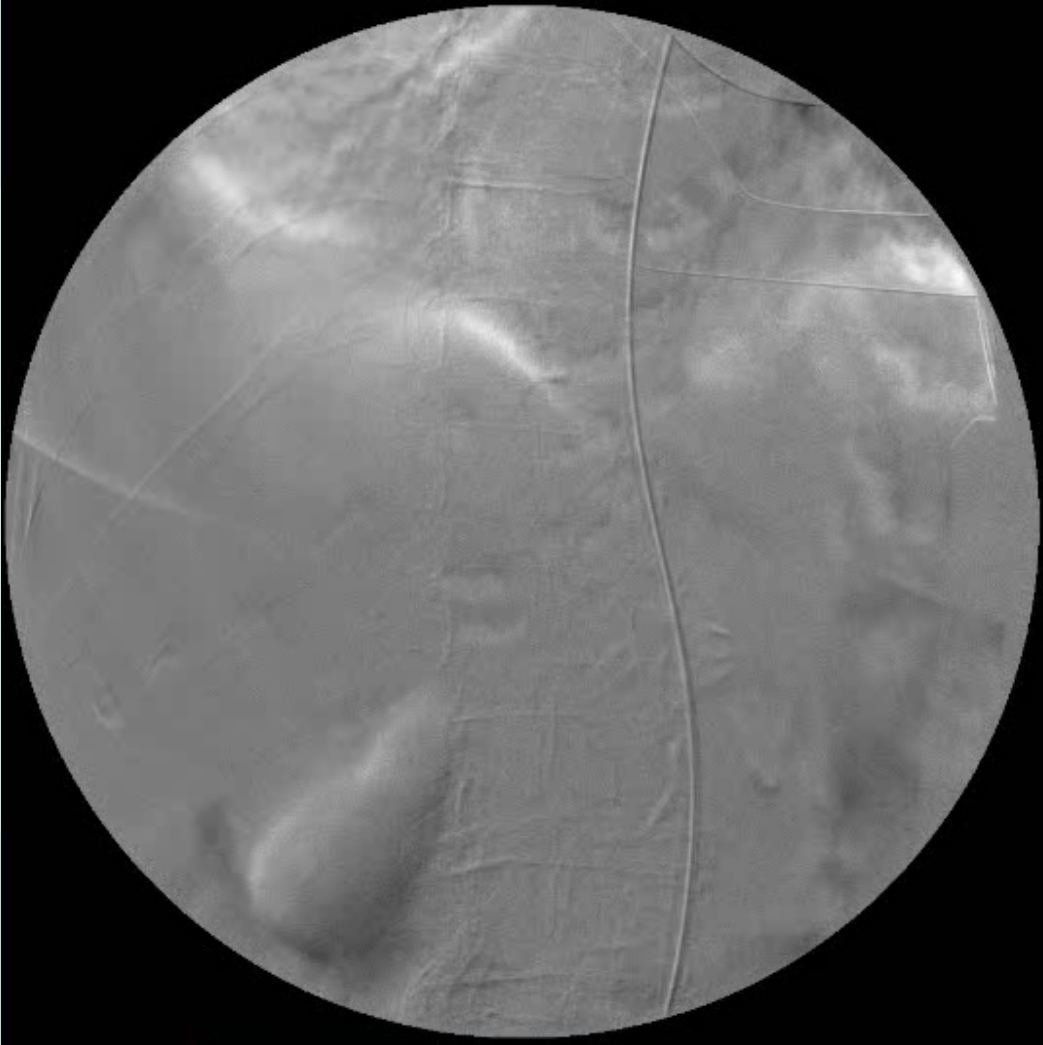
CLINICAL CASE

- 88 y
- Female
- Hematemesis
- Thoracic aortic aneurysm

Aorto-Esophageal Fistulae



Aorto-Esophageal Fistulae



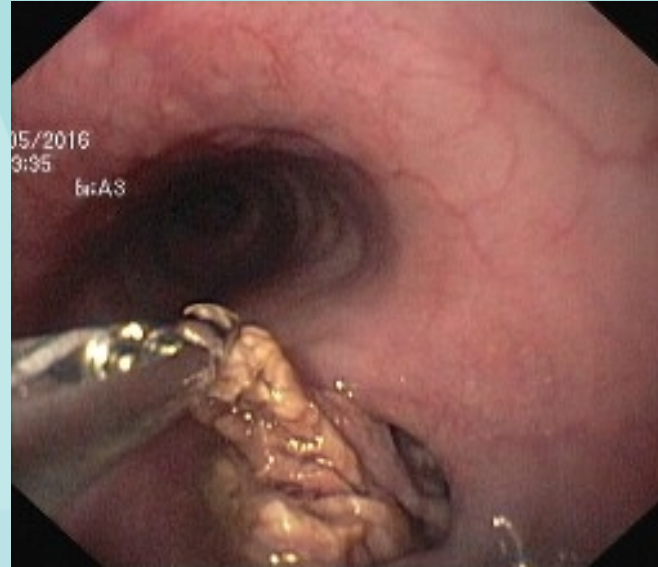
TEVAR Zenith alfa 32x120



Aorto-Esophageal Fistulae



Esophagography



Endoscopy at 2 weeks



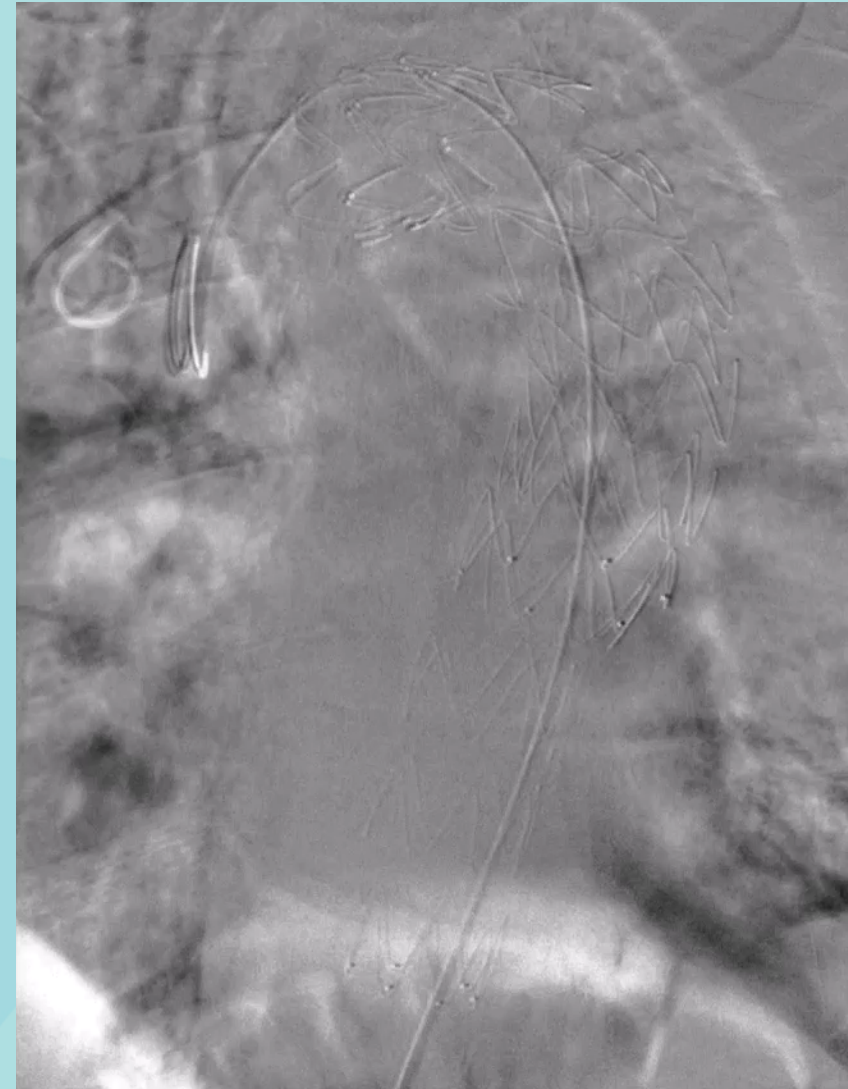
Endoscopy at 2 months

Aorto-Bronchial Fistulae

CLINICAL CASE

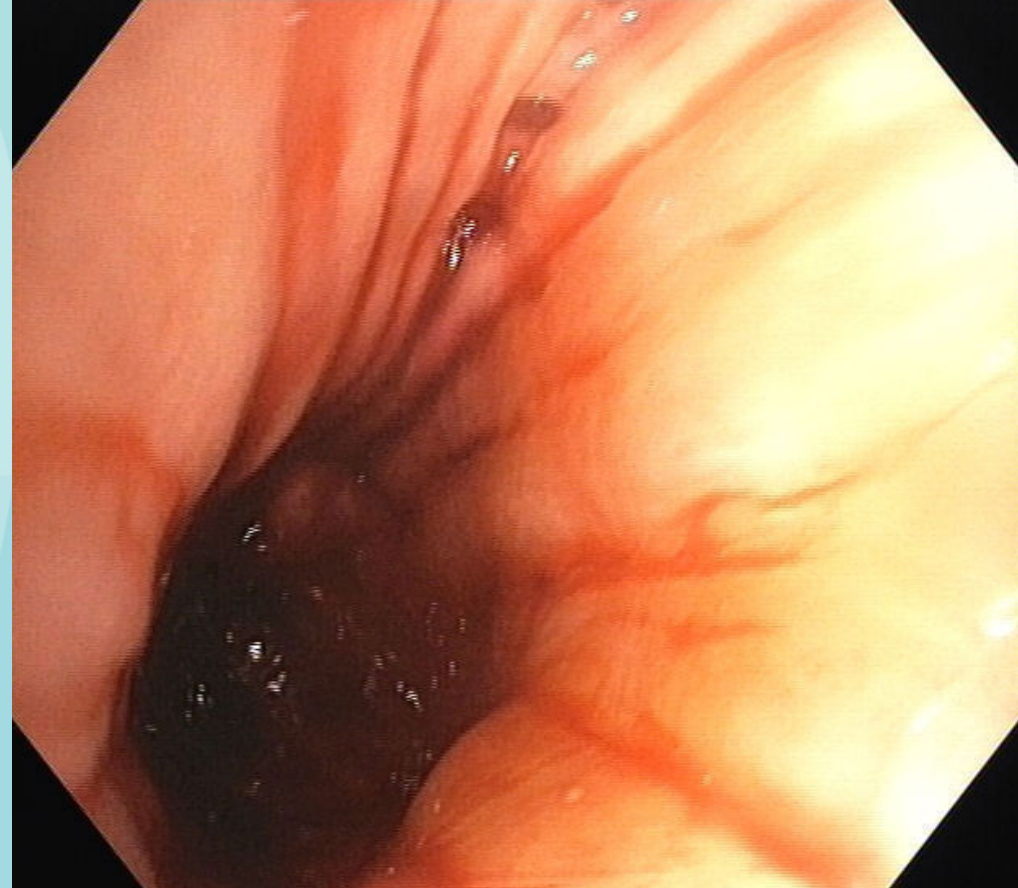
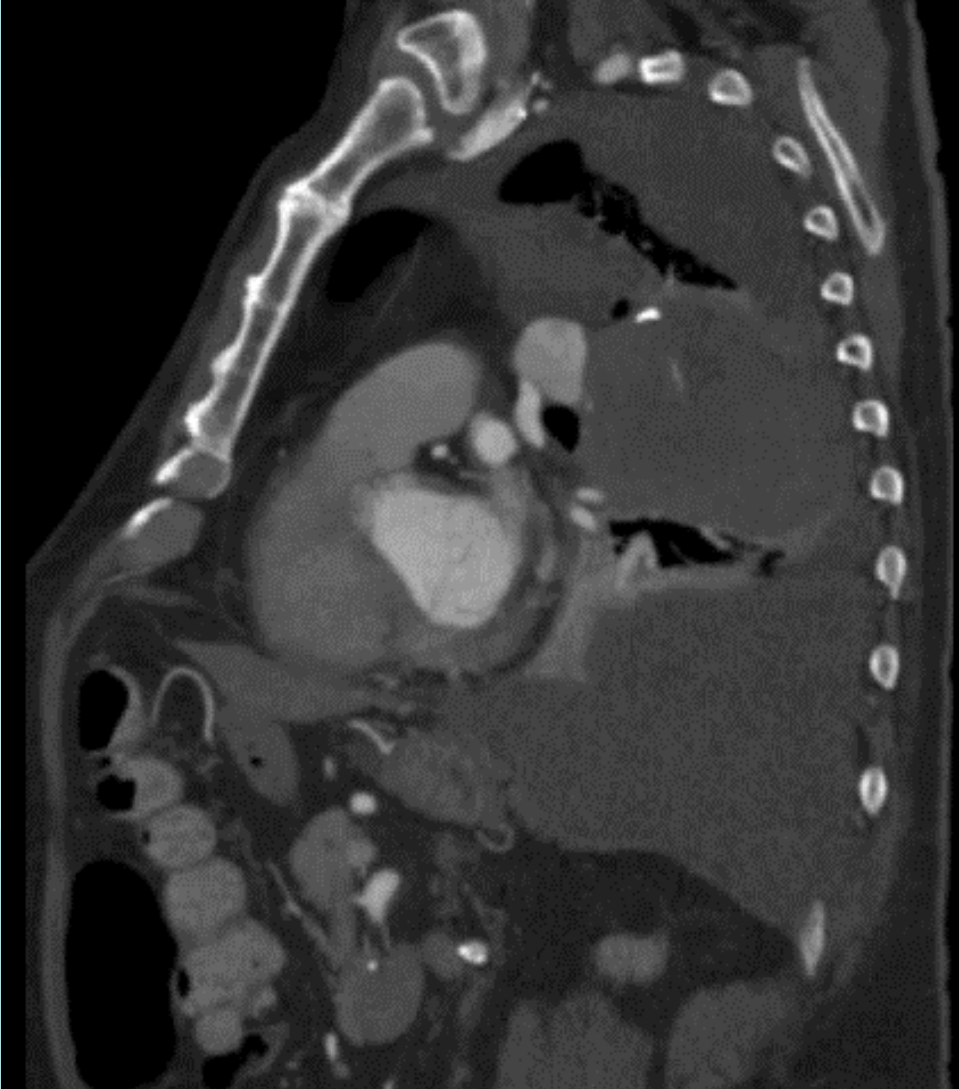
- 85 y
- Male
- **Thoracic pain**
- **Hemoptysis**
- **Thoracic aortic aneurysm**

Aorto-Bronchial Fistulae



TEVAR Zenith alfa 36x200 and 36x161

Aorto-Bronchial Fistulae



**Bronchoscopy @2 days
hemorrhage located to the left lower lobe
and lingula**

TEVAR for AEF and ABF at Hospital de Santa Maria 2009-2018



Characteristics of patients undergoing TEVAR for AEF and ABF

	N	Gender/age	Cause	Medical history	Presentation	Hb (g/dL)	CRP (mg/dL)
AEF	1	M/75	PAU	HT, DM, PAOD,CAD, CKD-dialysis, COPD, bladder malignancy	Hematemesis	11.4	9.50
	2	M/78	PAU	HT, stroke	Hematemesis, shock	9.0	11.74
	3	F/88	TAA	HT, stroke, COPD, PAOD	Hematemesis	8.1	5.50
	4	M/64	esophageal carcinoma	chemo and radiotherapy, alcoolism, CAD	Hematemesis, melena, fever	10.3	23.30
ABF	5	M/78	TAA	HT, DM, CKD, COPD	hemoptysis	10.4	0.3
	6	M/85	TAA	HT, COPD, lung tuberculosis	Thoracic pain, hemoptysis	9.1	3.3
	7	M/78	Infection of TEVAR for TAA (5 Y)	HT, DM, bladder malignancy	Hemoptysis, fever, shock	7.2	14.7
	8	M/76	TAA (bronchial biopsy 4 d)	HT, DM, hemochromatosis, lung linfoproliferative disease, lip carcinoma	Thoracic pain, dyspnea, fever	12.4	20.4

TEVAR for AEF and ABF at Hospital de Santa Maria 2009-2018



Characteristics of the TEVAR and additional therapy

	N	Anesthesia	CSF drainage	Vascular access	Graft details	Landing zone	Additional procedures	Success
AEF	1	general	N	left axillary	Zenith alfa 32x100	4	-	Y
	2	general	N	right femoral	Zenith TX2 34x152	3	TEVAR Zenith alfa 32x201 @ 3 m	Y
	3	local	Y	right femoral	Zenith alfa 32x120	4	-	Y
	4	general	N	right femoral	Zenith TX2 32x140	3	esophageal stent @ 2 d	Y
ABF	5	epidural	N	right femoral	Zenith TX2 36x160	4	-	Y
	6	general	N	right femoral	Zenith alfa 36x200 + 36x161	3	-	Y
	7	general	N	right femoral	Zenith TX2 36x202	0	-	Y
	8	general	N	right femoral	Zenith TX2 32x120	4	-	Y

TEVAR for AEF and ABF at Hospital de Santa Maria 2009-2018



Outcomes after TEVAR for ABF and AEF

	N	Length of stay (days)	Discharged	Complications	Follow-up (months)	Survival	Cause of death
AEF	1	12	N	-	0.5	N	acute mesenteric ischemia
	2	20+60	N	melena	6	N	sepsis
	3	21	Y	-	3	N	unknown
	4	53	Y	hemoptysis	9	N	esophageal malignancy
ABF	5	7	Y	-	42	Y	unknown
	6	22	Y	-	3	Y	-
	7	39	N	hemoptysis	2	N	pneumonia
	8	10	Y	-	1	N	unknown



CONCLUSIONS

- AEF as common as ABF vs ABF more common
- Older patients 77 vs 63 Y
- Severe comorbidities: 4 malignancies, 4 COPD, 1 hemodialysis
- TEVAR was successful in excluding the fistula
- No additional thoracic open surgery
- Median survival 3 months →

2 survivors: ABF, no fever and low CRP

1 alive @ 3 months follow-up

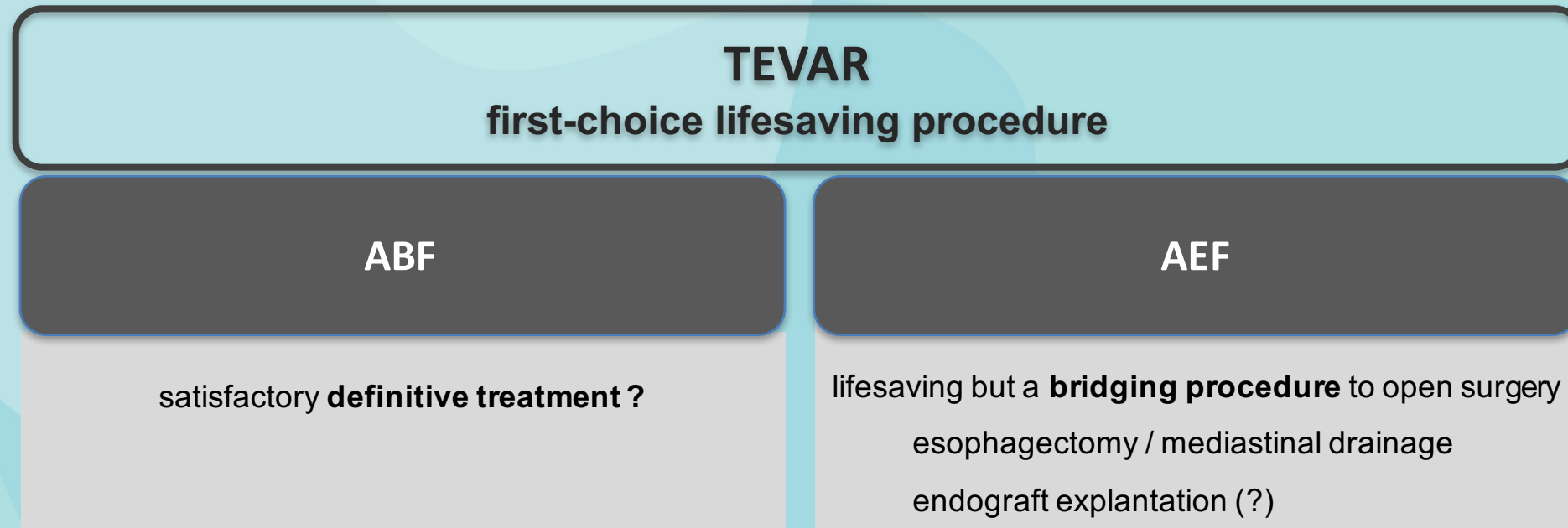
1 deceased @ 3,5 y

6 deceased

3 did not leave the hospital

CONCLUSIONS

- **AEF and ABF: rare and lethal, but different clinical entities**
- **AEF:** acute presentation, higher risk of infection, worse outcomes
- **Mortality** associated with presentation: sepsis, shock, malignancy
- **Emergent open surgery** is associated with high mortality rates



- **Long term antibiotic treatment is warranted**