8th International Congress

H T D I HOW TO DO IT AORTIC SURGERY PERIPHERAL & VENOUS

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Treatment results of descending thoracic aortic graft and endograft infection: **a systematic review**

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Disclosure statement

None relevant to this presentation

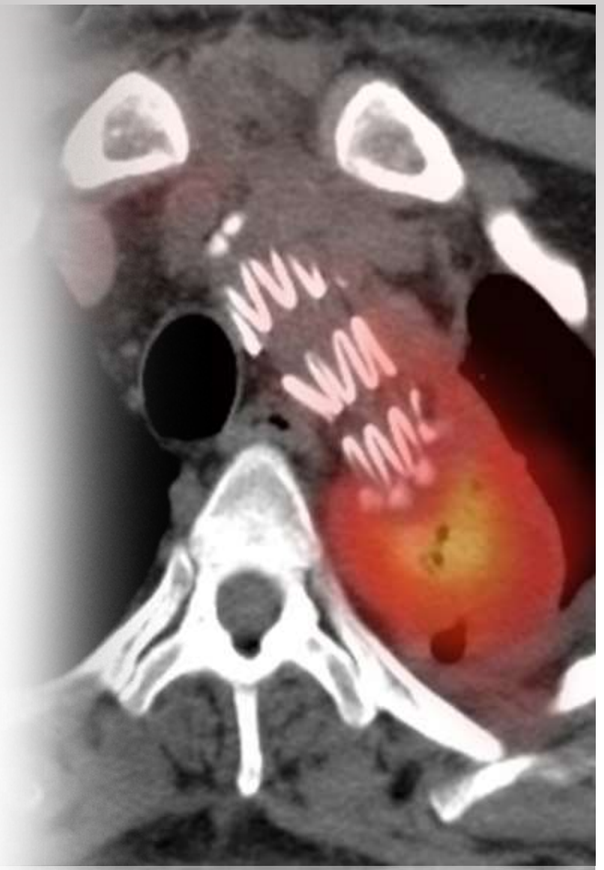
Upcoming ESVS Guidelines
on Vascular Graft Infections
Chair: Nabil Chakfe

Thoracic/Thoracoabdominal Aortic Graft Infections

Germano Melissano, Frank Vermassen

Systematic Review

- **Objective:** to collect and critically analyze the current evidence on the modalities and results of treatment of descending thoracic aortic surgical graft and endograft infection
- **Study design:** systematic review and meta-analysis
- **Methodology:** P.R.I.S.M.A. statement standards
- **Studies quality assessment:** Newcastle-Ottawa Scale



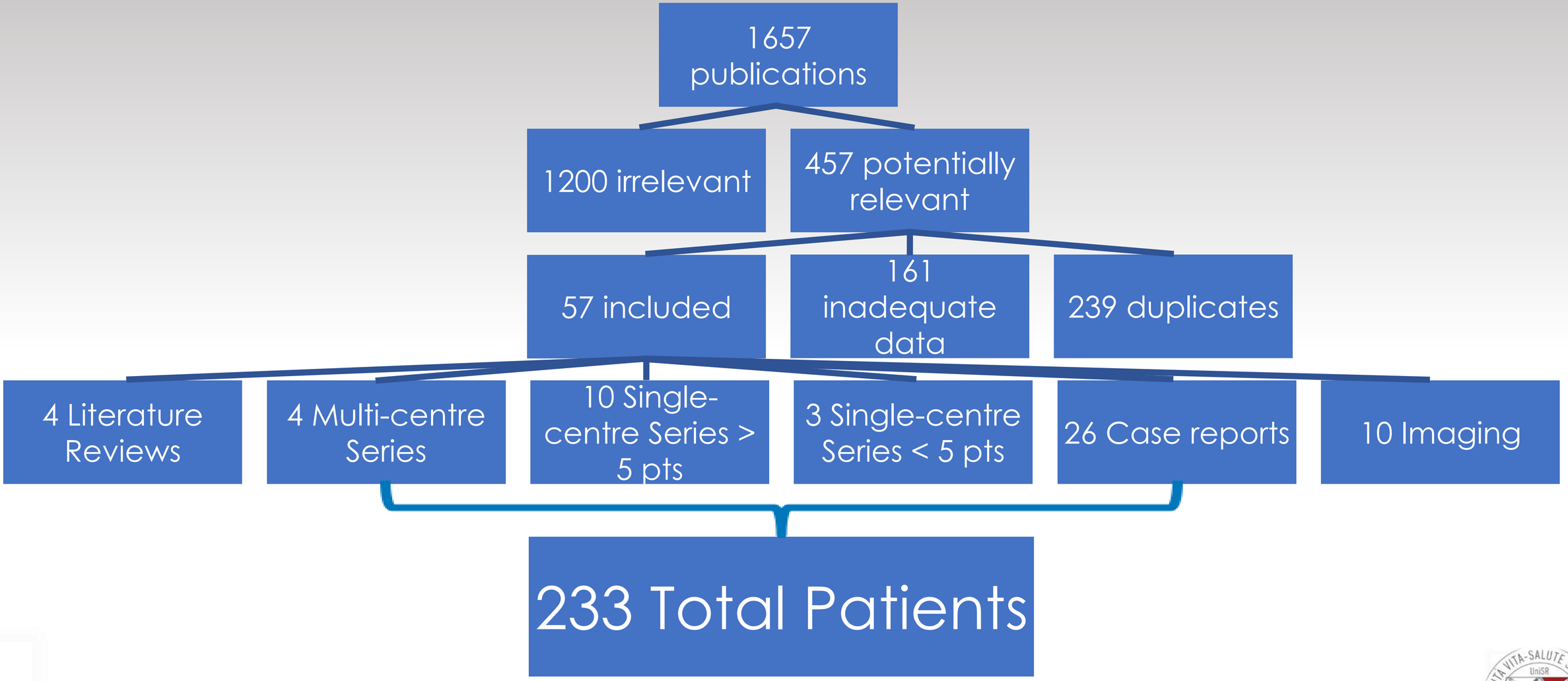
Kahlberg et al., J Vasc Surg (accepted)

Strings / Search Engines

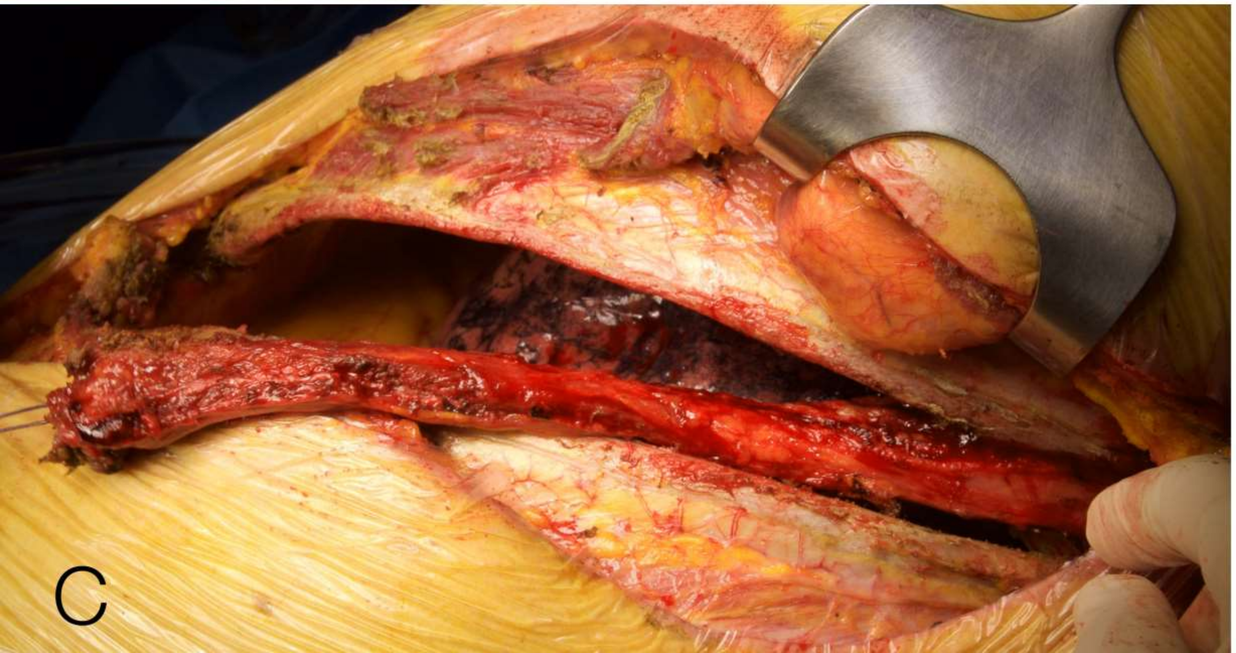
- ✓ “thoracic aorta” AND “infection”
- ✓ “thoracic
- ✓ “thoracic
- ✓ “thoracic
- ✓ aorto-esc
- ✓ aorto-bronchial fistula

1,657 studies retrieved

Flow chart of studies included



Multicenter Series



Demographics & Indications

107 patients, all with **post-TEVAR** infection

Authors	Year	# of Patients	Age	Males	Time to Diagnosis (Days)	ATS aneurysm	TBD / PAU / IMH
Chiesa et Al.	2010	19	73.8 (SD 7.1)	16 (84%)	327 (-)	13 (68%)	2 (11%)
Smeds et Al.	2014	26	68	20 (77%)	540 (5-2100)	-	-
Czerny et Al.	2014	36	69 (IQR 56-75)	27 (75%)	90 (30-150)	28 (77%)	-
Czerny et Al.	2015	26	70 (IQR 60-77)	17 (65%)	310 (28-1065)	15 (58%)	6 (23%)
					Mean 236 days		

Clinical Presentation

107 patients, mostly **with a fistula**

Authors	Pain	Fever/Chills	Haematemesis / Haemoptysis	Shock	AEF	ABF	AEF + ABF
Chiesa et Al.	1 (5%)	1 (5%)	13 (68%)	5 (26%)	13 (68%)	5 (26%)	5 (26%)
Smeds et Al.	17 (66%)	17 (66%)	-	-	12 (46%)	0	0
Czerny et Al.	-	29 (81%)	19 (53%)	8 (22%)	36 (100%)	0	0
Czerny et Al.	4 (15%)	7 (27%)	24 (92%)	6 (23%)	0	26 (100%)	0

Papers reportig post-TEVAR fistula

Management

107 patients

Authors	Conservative	Fistula Repair Only	Open + Fistula Repair	Open - Fistula Repair	Endo + Fistula Repair	Endo - Fistula Repair	Overall Mortality
Chiesa et Al.	8 (42%)	6 (32%)	1 (5%)	1 (5%)	1 (5%)	2 (11%)	56% 2-year
Smeds et Al.	5 (19%)	-	-	21 (81%)	-	-	71% 5-year
Czerny et Al.	10 (28%)	13 (36%)	13 (36)	-	6 (17%)	-	72% 1-year
Czerny et Al.	5 (19%)	3 (12%)	9 (35%)	-	2 (8%)	7 (27%)	61% 2-Year
	Mean 27%	**Mean 16%**	**Mean 40%**		**Mean 17%**		

SAN RAFFAELE

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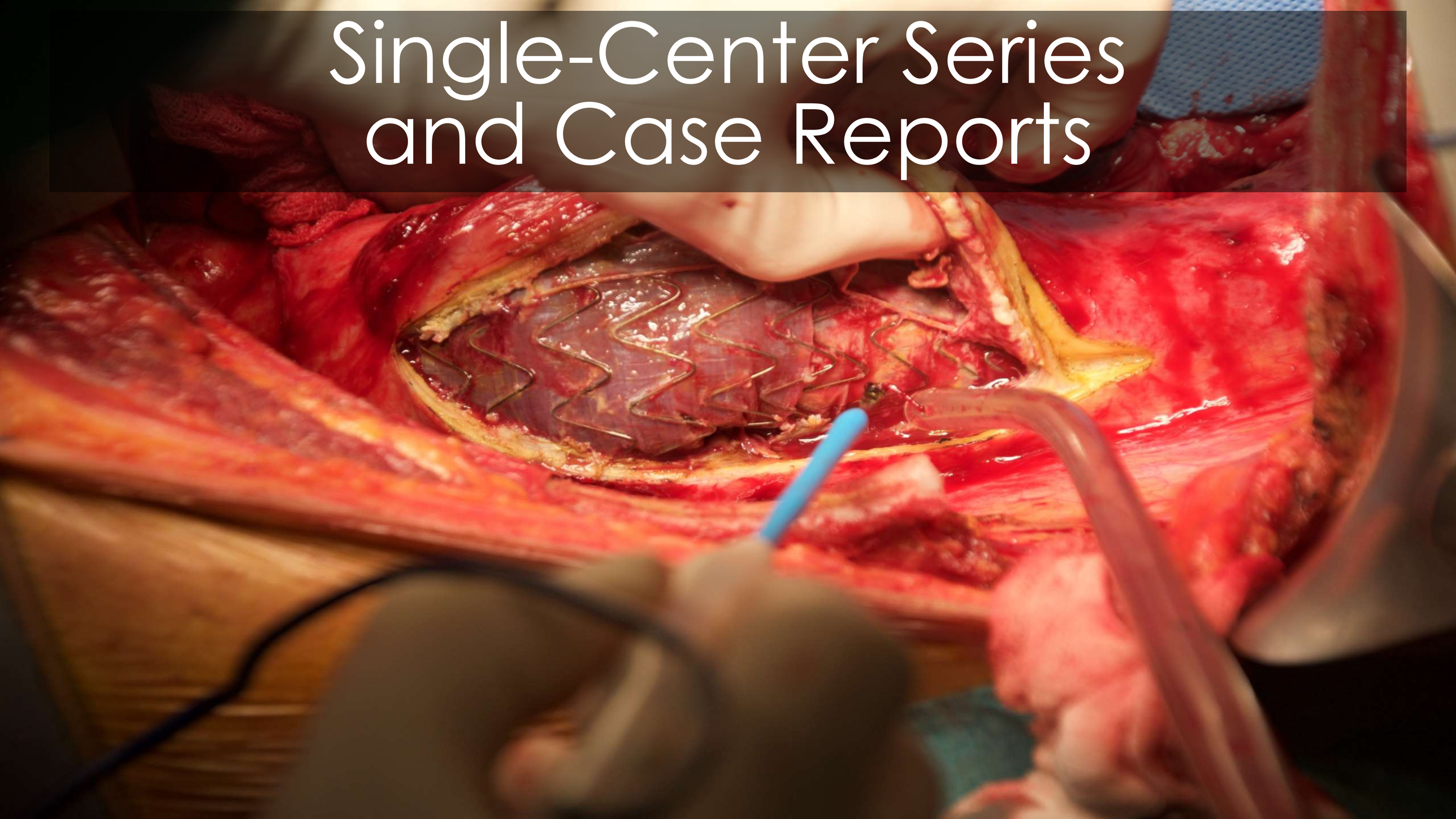
Single-Center Series and Case Reports



Clinical Presentation

126 patients, with **post-OPEN (49)** and **post-TEVAR (77)** infection

		Males	Age	Timing to Diagnose (Days)	Pain	Fever/ Chills	Haema temesis	Haemo ptysis	Shock	AEF	ABF	AEF + ABF
Previous Open (49)	%	83	64.9	966	73	84	81	16	11	31	13	0
Previous TEVAR (77)	%	73	62.5	513	35	61	42	15	15	60	18	2
Tot (126)	%	77	63.9	678	52	69	62	26	14	50	16	1

Management

0 = Conservative
1 = TEVAR
2 = Open Aortic Replacement
3 = Esophageal Stenting Only
4 = Esophagectomy only
5 = Open Bronchial/Pulmonary Treatment
6 = TEVAR + Conteporary Esophageal Repair
7 = TEVAR + Late Esophageal Repair
8 = TEVAR + Esophageal Stenting
9 = TEVAR + Bronchial/Pulmonary Treatment
10 = Open Aortic Replacement + Contemporary Esophageal Treatment
11 = Open Aortic Replacement + Late Esophageal Treatment
12 = Open Aortic Replacement + Bronchial/Pulmonary Treatment
13 = Exploration
14 = EAB
15 = Prosthesis Coverage + Bronchial/Pulmonary Treatment
16 = TEVAR + Conteporary Esophageal Repair + Late Open Aortic Repair
17 = Esophagectomy + Late Open Aortic Repair
18 = Exploration + Packing + Late Open Aortic Surgery
19 = Exploration + Drainage + Irrigation + Late Open Aortic Surgery
20 = Exploration + TEVAR + Drainage + Irrigation + Late Open Aortic Surgery
21 = Graft Excision + Oversewing of proximal and distal aortic stumps without reconstruction
22 = TEVAR + Late Open Aortic Repair
23 = EAB + Esophageal Repair
24 = EAB + TEVAR + Aortic Ligation+ Pulmonary Repair
25 = Open Aortic Replacement + Contemporary Esophageal Treatment + Bronchial/Pulmonary Treatment

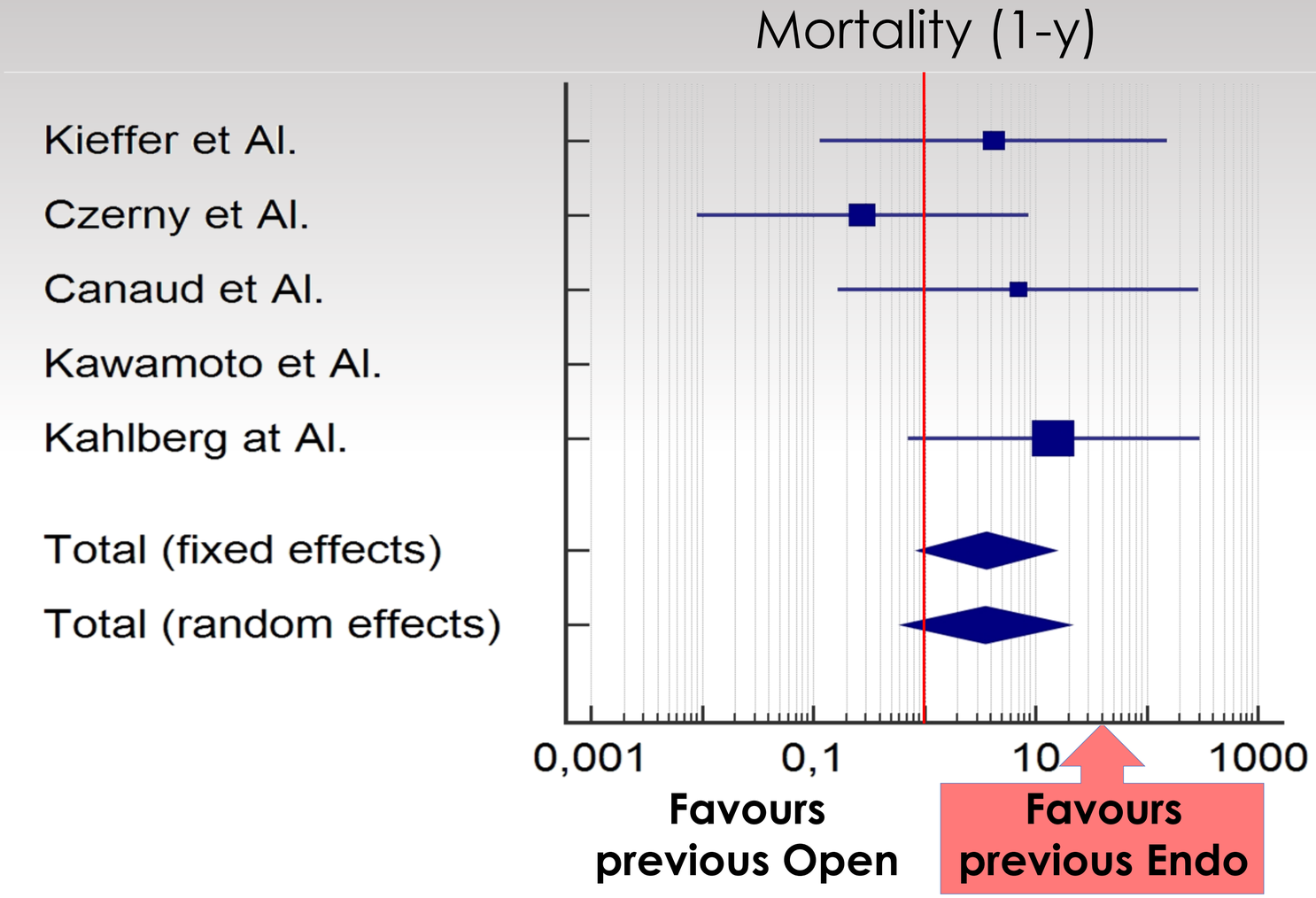
		Conser	Endo - Fistula Repair	Endo -> Open
Previous Open (49)	%	2	52	12.5
Previous TEVAR (77)	%	18	21.5	6.5
Tot (126)	%	1	%	9

Mortality

126 patients (%)

	Conservative	Fistula Repair Only	Open - Fistula Repair	Endo + Fistula Repair	Endo - Fistula Repair	Endo -> Open
30-Day	47	10	33	34	26	10
1-Year	79	45	78	49	43	27
5-Year	100	67	100	70	57	40

Meta-analysis: Index Procedure

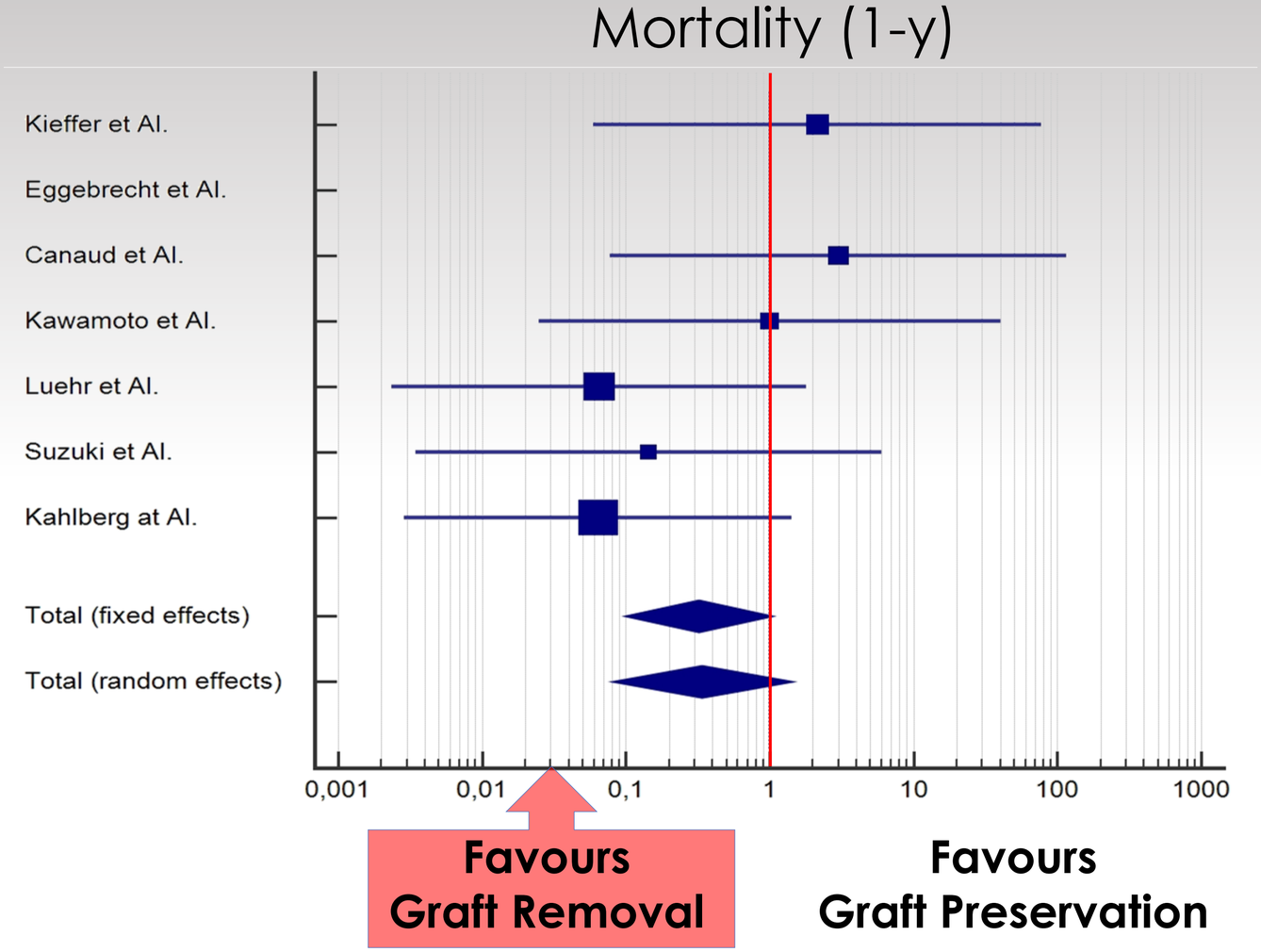


p = 0.073 **OR = 3.609**

95% CI = 0.887 to 14.688

I^2 = 2.03%

Meta-analysis: Infected Graft Removal

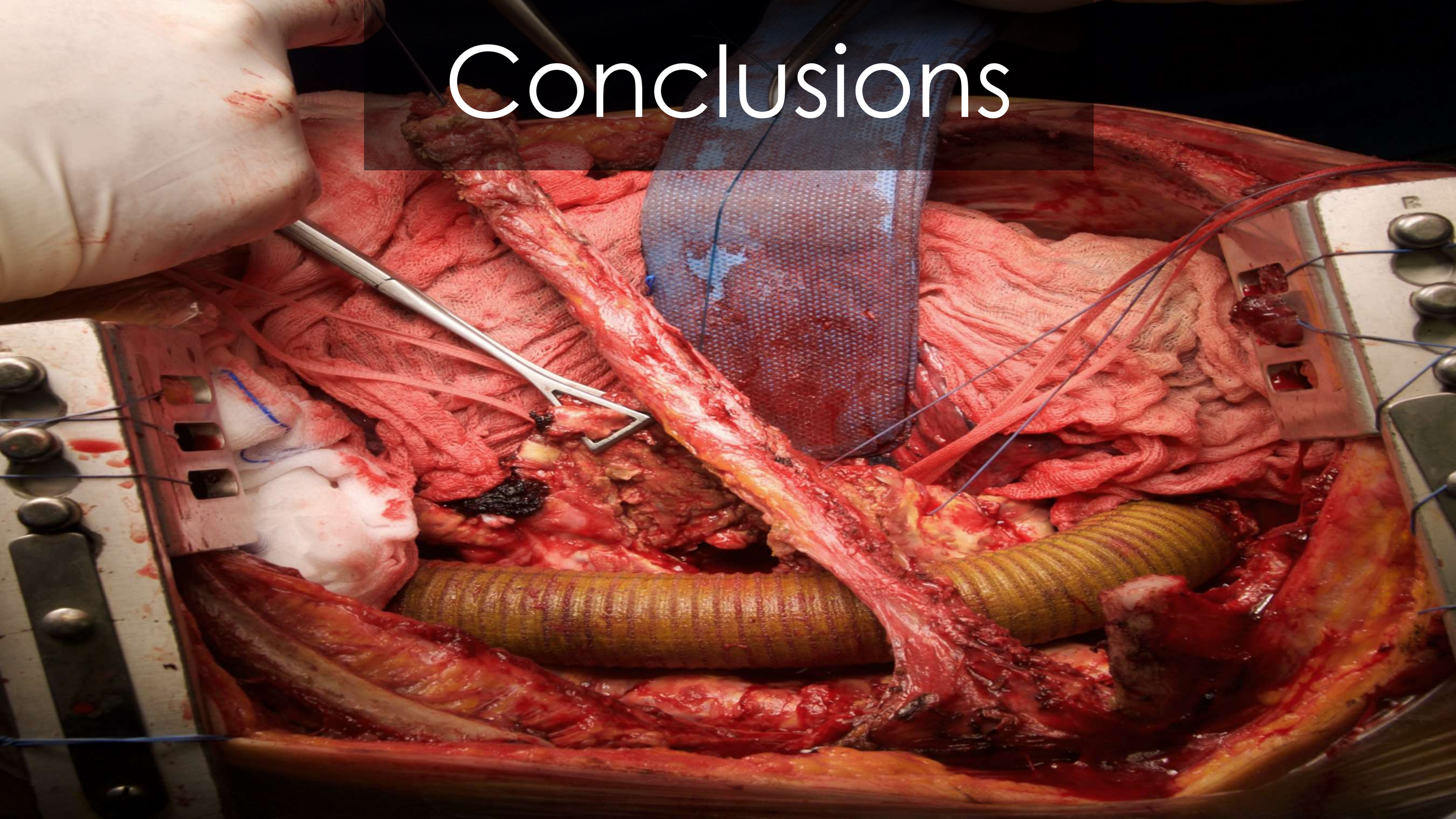


p = 0.056 **OR = 0.321**

95% CI = 0.100 to 1.032

I^2 = 0.00%

Conclusions



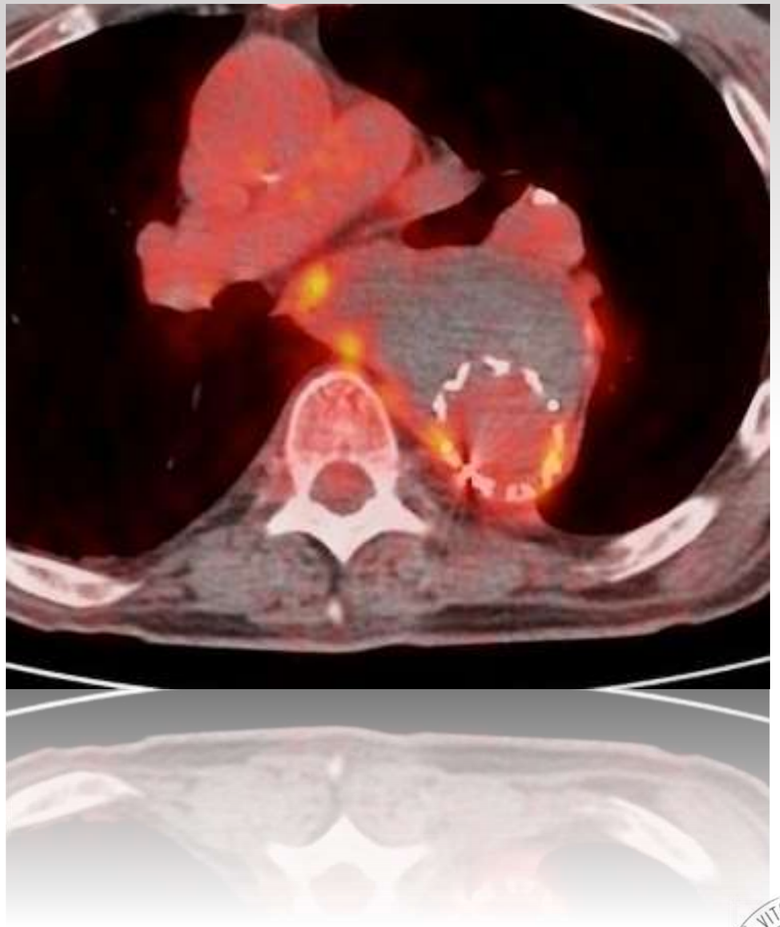
Infection of surgical *vs* endovascular grafts

- **Infections of surgical grafts**
  - associated with increased operative mortality

- **Infections of endovascular grafts**
  - occur earlier
  - more associated with fistulae

Conservative Treatment

- **100% mortality rate** at 5 years
- Fistula repair alone can decrease mortality rate

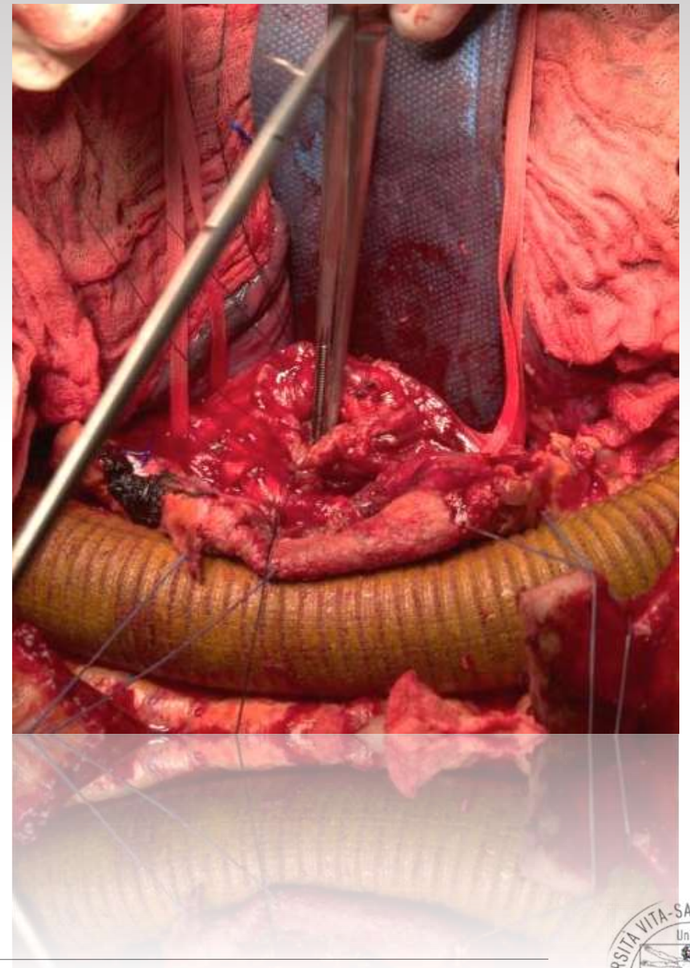


Emergency TEVAR

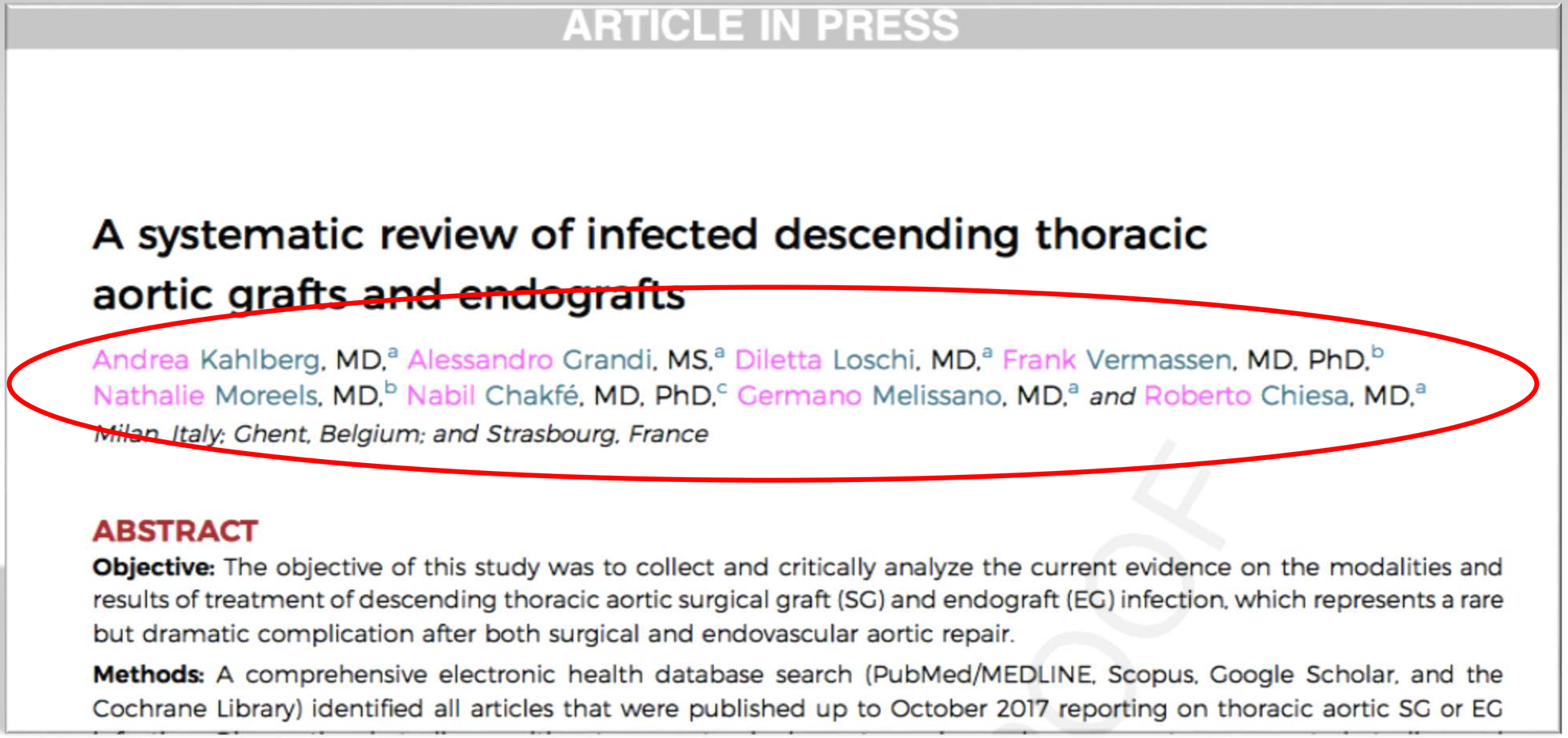
- Excellent **"stop-gap" procedure** in case of bleeding fistula
- Concerns if not followed by definitive surgery

Open surgery

- High mortality rates
- **Infected graft removal is better**
- Improved survival if performed electively (after initial stabilization with TEVAR)



Thank you!



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A systematic review of infected descending thoracic aortic grafts and endografts

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ABSTRACT

Objective: The objective of this study was to collect and critically analyze the current evidence on the modalities and results of treatment of descending thoracic aortic surgical graft (SG) and endograft (EG) infection, which represents a rare but dramatic complication after both surgical and endovascular aortic repair.

Methods: A comprehensive electronic health database search (PubMed/MEDLINE, Scopus, Google Scholar, and the Cochrane Library) identified all articles that were published up to October 2017 reporting on thoracic aortic SG or EG

Kahlberg et al., J Vasc Surg (accepted)