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The 2023 Workshop of International Society of Minimally Invasive Cardiac Surgery (ISMICS) &
The 9th Scientific Conference of Thoracic and Cardiovascular Surgery of Viet Nam (ATCSVN)

Ho Chi Minh City
16.-18. November 2023



Treating Infective TEVAR Grafts

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Disclosures: none



Etiology I

AORTA **State-of-the-Art Review**

Aorta, December 2014, Volume 2, Issue 6: 255–264
DOI: <http://dx.doi.org/10.12945/j.aorta.2014.14-036>

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How To Diagnose and Manage Infected Endografts after Endovascular Aneurysm Repair

Carlo Setacci, MD¹, Emiliano Chisci, MD^{2*}, Francesco Setacci, MD³, Leonardo Ercolini, MD², Gianmarco de Donato, MD¹, Nicola Troisi, MD², Giuseppe Galzerano, MD¹, Stefano Michelagnoli, MD²

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- Bacterial adherence (depending on length of contact to aortic wall and extent of endothelialization)
- Intact aneurysm >>> close space >>> more aggressive infection?
- Thrombus as a nidus for bacteria?
- Perioperative contamination (most common, emergency/urgent procedures)

Etiology II

AORTA

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- Hematogenous seeding
- Mechanical erosion
- Immunodeficiency (steroid therapy)
- Lack of antibiotic prophylaxis
- 50% manifestation in 2nd year of FU



Etiology

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Review

Aortic Endograft Infection: Diagnosis and Management

Young-Wook Kim

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Aortic endograft infection (AEI) is a rare but life-threatening complication of endovascular aneurysm repair (EVAR). The clinical features of AEI range from generalized weakness and mild fever to fatal aortic rupture or sepsis. The diagnosis of AEI usually depends on clinical manifestations, laboratory tests, and imaging studies. Management of Aortic Graft Infection Collaboration (MAGIC) criteria are often used to diagnose AEI. Surgical removal of the infected endograft, restoration of aortic blood flow, and antimicrobial therapy are the main components of AEI treatment. After removing an infected endograft, in situ aortic reconstruction is often performed instead of an extra-anatomic bypass. Various biological and prosthetic aortic grafts have been used in aortic reconstruction to avoid reinfection, rupture, or occlusion. Each type of graft has its own merits and disadvantages. In patients with an unacceptably high surgical risk and no evidence of an aortic fistula, conservative treatment can be an alternative. Treatment results are determined by bacterial virulence, patient status, including the presence of an aortic fistula, and hospital factors. Considering the severity of this condition, the best strategy is prevention. When encountering a patient with AEI, current practice emphasizes a multidisciplinary team approach to achieve an optimal outcome.

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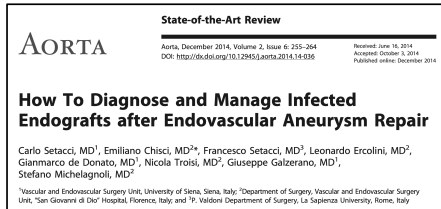
Table 2. Possible sources of aortic endograft infection in 180 EVARs and 26 TEVARs

Possible source of aortic endograft infection (n=205)	No. (%)
Infection at index operation	70 (34)
Groin infection	14 (7)
Urinary tract infection	16 (8)
Other infection	40 (19)
Contaminated index operation	29 (14)
Endoleak at index operation	52 (25)
No intervention	23 (11)
With intervention	29 (14)
Interval procedure after EVAR	69 (34)
Interval known infection after EVAR	78 (38)

Adapted from the article of Smeds et al. (J Vasc Surg 2016;63:332-340) [10] with original copyright holder's permission.
EVAR, endovascular aneurysm repair; TEVAR, thoracic endovascular aneurysm repair.



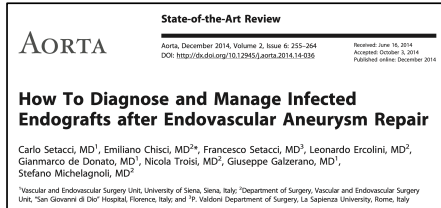
Diagnosis



- Clinical symptoms
- Imaging
- Microbial cultures (negative in up to 33% cases!)
- Blood testing (leukocytosis, CRP >>> monitoring)
- Angio-CT scan (perigraft air, tissue infiltration, fluid accumulation, pseudoaneurysm, ectopic gas, discontinuity of the aneurysmal wall, contrast enhancement)



Diagnosis



- aorto-enteric fistula (33-80% confirmed by CT scan)
- Endoscopy (does not exclude diagnosis, if no fistula is seen)
- MRI (higher sensitivity for small perigraft fluid collections)
- Leucocyte scan + CT scan
- FDG-PET + CT scan



Diagnosis

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Review

Table 4. Sensitivities and specificities for each imaging modality in the diagnosis of vascular graft/endograft infection

Imaging tool	Reported ranges	
	Sensitivity	Specificity

Combination of imaging tools!

Data from the article of Chakfé et al. (Eur J Vasc Endovasc Surg 2020;59:339-384) [19].

CT, computed tomography; FDG, fluorodeoxyglucose; PET, positron emission tomography; WBC, white blood cell; SPECT, single photon emission computed tomography.



Therapy Review

General Review

Current Evidence on Management of Aortic Stent-graft Infection: A Systematic Review and Meta-Analysis

Hai Lei Li,¹ Yiu Che Chan,² and Stephen W. Cheng,² Guangdong and Hong Kong, China

Background: Aortic stent-graft infection (SGI) is rare but remains one of the most challenging and threatening complications. This systematic review aimed to identify the clinical features, treatment, and outcomes of endograft infection after abdominal endovascular aortic repair (EVAR) and thoracic endovascular aortic repair (TEVAR).

Methods: A systematic literature review of all published literature from January 1991 to September 2016 on SGI was performed under the instruction of Preferred Reporting Items for Systematic Reviews and Meta-Analyses. *Aorta, aneurysm, endovascular, stent-graft, endograft* and *infection* were the keywords used in our comprehensive search in PubMed and MEDLINE databases. Data analysis was performed using SPSS, V 22.0.

Results: A total of 185 potential relevant articles were identified, but only 11 studies with 402 patients met the inclusion criteria. Majority of the patients were male (308/402, 77%), with a mean age ranging from 65 to 73 years. Most of the endografts were implanted for EVAR (351/402, 87%), while the other 51 (13%) endografts were infected following TEVAR. Among the 402 patients, 39 (9.7%) patients presented with aortic rupture. Ninety-two of 380 (24.2%) patients with available data had aortoenteric fistula (AEF). Sixty-nine patients (17%) died in hospital or within 30 days after operation. One hundred fourteen patients (28%) died during follow-up. The most commonly used stent grafts were Zenith (Cook Inc, Bloomington, IN) (22%) and Excluder (W.L. Gore, Flagstaff, AZ) (20%). Of the 402 patients in this series, 108 patients (27%) had negative culture, and multiple microorganisms were identified in 103 patients (26%). The most frequently isolated microorganisms were *Staphylococcus* species (30.1%), *Streptococcus* (14.8%), and fungus (9.2%). Forty-two patients (42/401, 10%) received conservative treatment, whereas 359 (90%) patients underwent surgical treatment, including stent graft removal with in situ reconstruction or extra-anatomical bypass, and secondary endovascular procedure. Patients in the surgical group had a higher survival rate compared with conservative group (58% vs. 33%, $P = 0.002$). The survival rate was higher in the patients with infected EVAR than TEVAR (58% vs. 27%, $P = 0.000$). Patient with AEF had a worse prognosis (survival rate 72% vs. 33%, $P = 0.002$).

Conclusions: Current evidence suggests that surgical treatment is a better option compared with conservative management in selected patients with aortic endograft infection. The outcome was worse in patients with infected TEVAR and AEF.

Table IV. Cultured microorganism

Microorganism species	Number (%) Data available, N = 196
<i>Staphylococcus</i>	59 (30.1)
<i>Streptococcus</i>	29 (14.8)
Fungus	18 (9.2)
<i>Escherichia coli</i>	15 (7.7)
<i>Enterobacter cloacae</i>	11 (5.6)
<i>Pseudomonas aeruginosa</i>	8 (4.0)
<i>Propionibacterium</i>	6 (3.0)
<i>Bacteroides</i>	5 (2.5)
Others	4 (2.0)

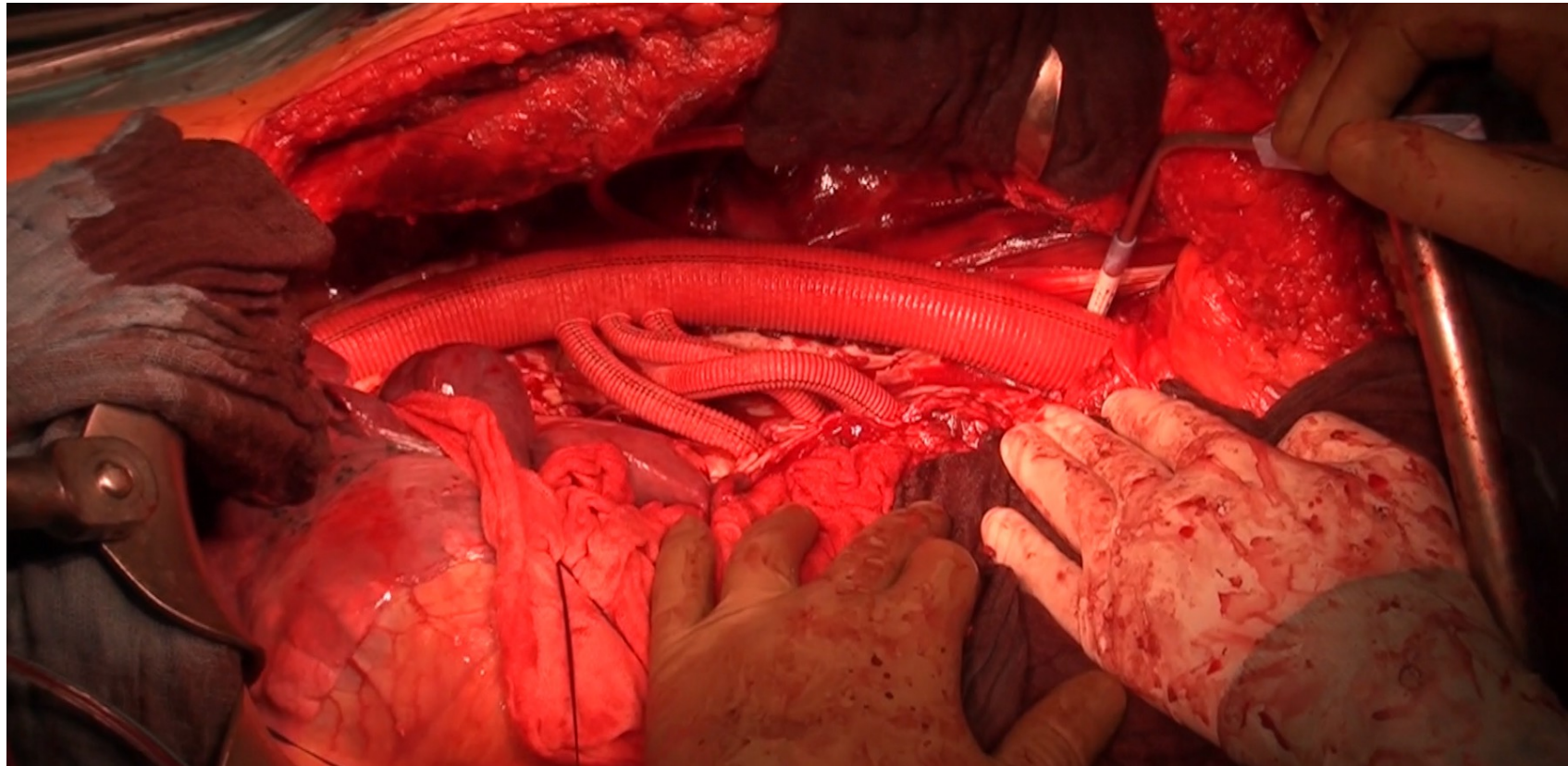


Basic surgical principle!

„Ubi pus, ibi evacua!“



Thoracoabdominal Aortic Repair



Outcome

Meta-analysis

JOURNAL OF
ENDOVASCULAR
THERAPY
AN ISEV5 PUBLICATION

Endograft Infection After Endovascular Abdominal Aortic Aneurysm Repair: A Systematic Review and Meta-analysis

Journal of Endovascular Therapy
1–10
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SAGE

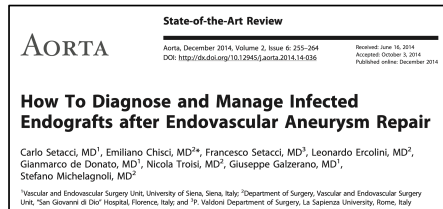
Christos Argyriou, MD, PhD¹, George S. Georgiadis, MD, PhD¹,
Miltos K. Lazarides, MD, PhD, FEBVS¹, Efstratios Georgakarakos, MD, PhD, MSc¹,
and George A. Antoniou, MD, PhD, MSc, FEBVS²

Abstract

Purpose: To report a meta-analysis of the published evidence on the outcomes of aortic endograft infection after endovascular aneurysm repair (EVAR). **Methods:** A search of electronic information sources (PubMed/MEDLINE, SCOPUS, CENTRAL) and bibliographic reference lists identified 12 studies reporting on 362 patients (mean age 72 years; 279 men). The methodological quality of the selected studies was assessed using the Newcastle-Ottawa scale. Endpoints were 30-day/in-hospital mortality and follow-up mortality. Pooled estimates are reported with the 95% confidence interval (CI). The review was registered at the International Prospective Register of Systematic Reviews in Health and Social Care (CRD42016034166). **Results:** The incidence of graft infection after EVAR was 0.6% (95% CI 0.4% to 0.8%). The time from implantation to diagnosis ranged from 1 to 128 months (mean 25). The majority of patients (293, 81%) underwent surgical treatment (95% CI 77% to 83%); 9 (2.5%) patients (95% CI 21% to 43%) received conservative treatment. Aortic replacement with a prosthetic graft was performed in 58% (95% CI 52% to 62%), whereas cryopreserved allografts and autologous grafts were used in 31% (95% CI 28% to 33%) and 11% (95% CI 8% to 14%), respectively. Less than half of the patients (40%) had emergency surgery. The pooled estimate of 30-day/in-hospital mortality was 26.6% (95% CI 16.9% to 39.2%). The pooled 30-day/in-hospital mortality for 9 patients treated conservatively was 63.3% (95% CI 30.7% to 87.0%). The pooled overall follow-up mortality was 45.7% (95% CI 36.4% to 55.4%) vs 58.6% (95% CI 28.8% to 83.3%) for the 9 patients receiving conservative treatment. **Conclusion:** Aortic endograft infection is a rare complication after EVAR. Surgical treatment with complete explantation of the infected endograft seems to be the optimal management in selected patients. Supportive medical treatment without surgical intervention has a significant associated mortality.

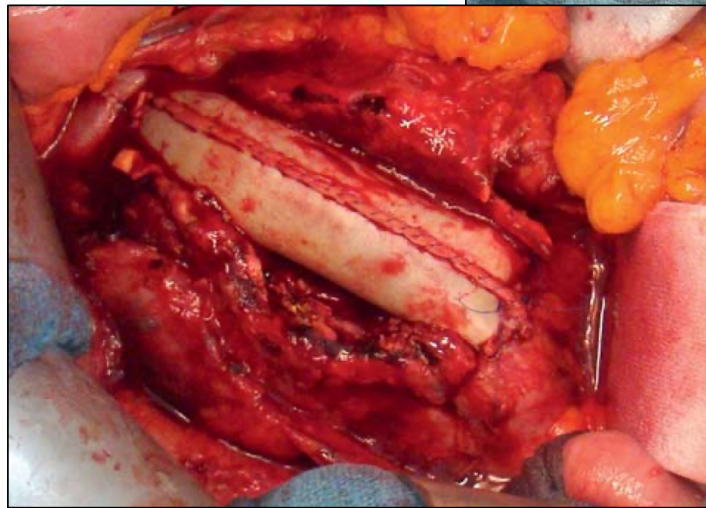
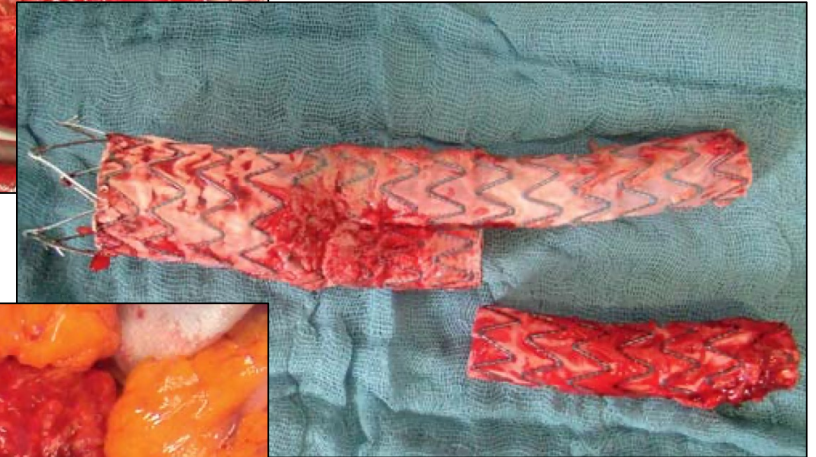
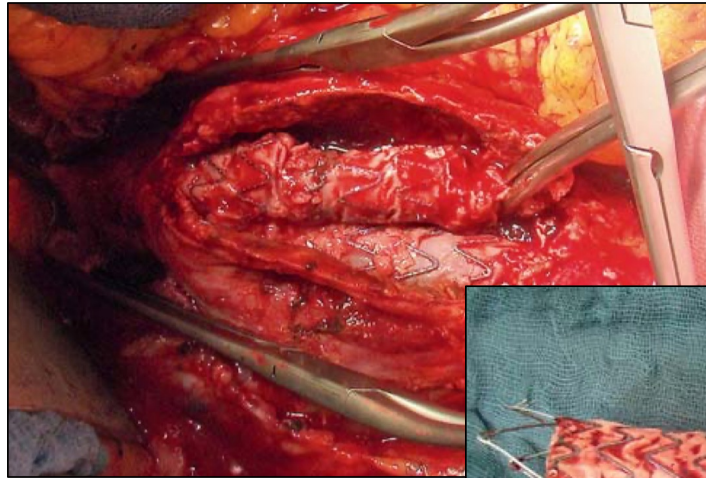
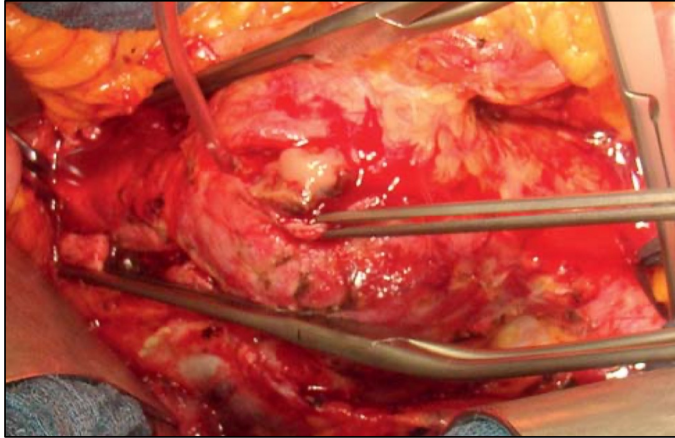
- Incidence of EVAR graft infection
0.6% (95% CI 0.4%-0.8%)
- Time range to diagnosis of infection
1 – 128 months (mean 25 months)
- 81% surgical treatment
- 30-day mortality 26.6%
- Overall FU mortality 45.7%

Therapy Surgery



- Therapy of choice!
- Stent graft removal and revascularization
- Extra-anatomical bypass
- Dacron grafts (antibiotic-impregnated silvergrafts >>> reinfection rate 4 – 22%)
- Cryopreserved homografts, xenologous pericardial neotubes

Therapy



Therapy Review

REVIEW ARTICLE

Richard P. Cambria, MD, Section Editor

Comparison of treatment strategies for thoracic endograft infection

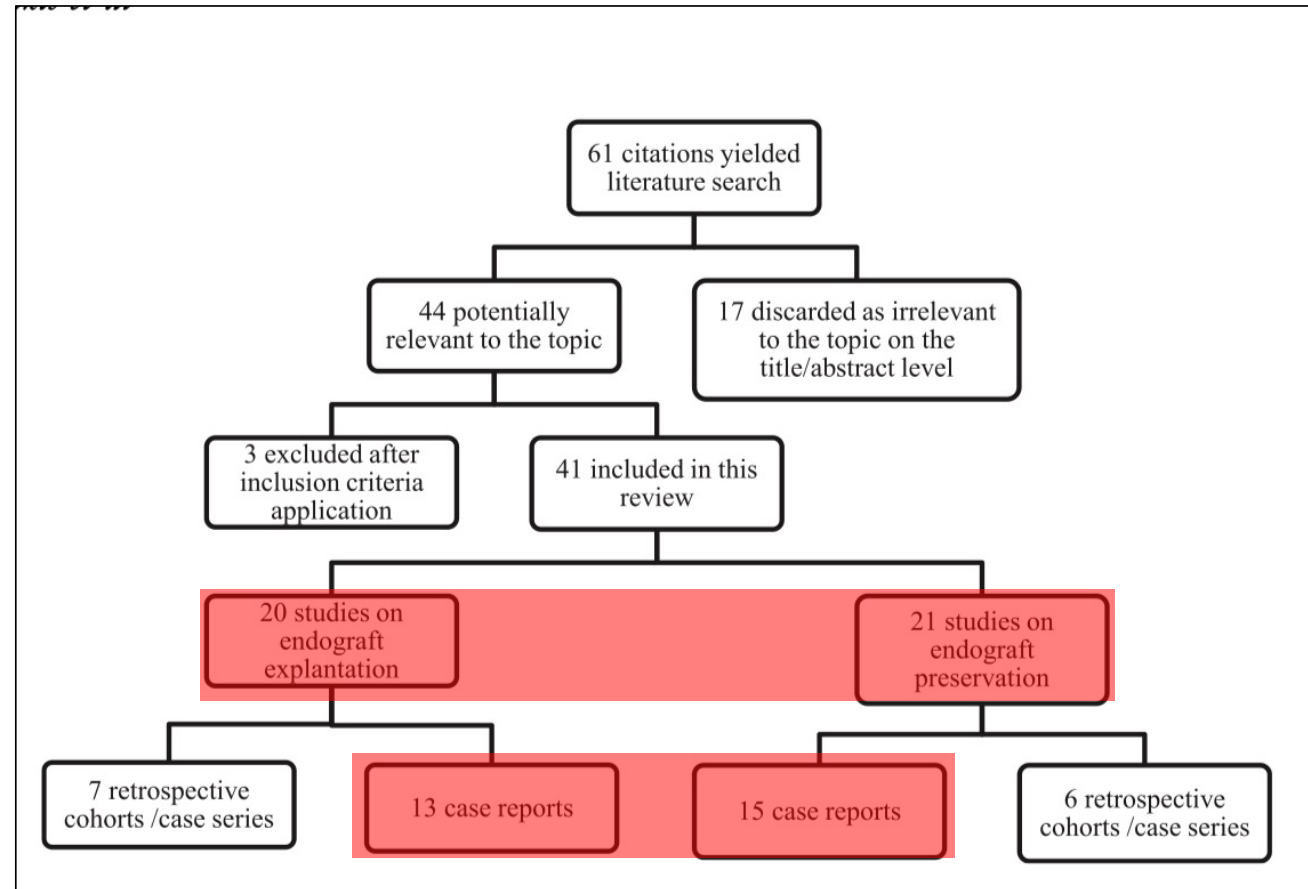
Konstantinos G. Moulakakis, MD, Spyridon N. Mylonas, MD, Constantine N. Antonopoulos, MD, John D. Kakisis, MD, George S. Sfyroeras, MD, George Mantas, MD, and Christos D. Liapis, MD, FACS, Athens, Greece

Objective: Endograft infection after thoracic endovascular aortic repair (TEVAR) is associated with a substantial mortality rate that exceeds 70% in the largest published series. The aim of this study was to review all published reports on infection after TEVAR treated with either preservation of the endograft or surgical excision of the stent graft with the intention of providing a comparison of the safety, efficacy, and durability of the two different treatment strategies.

Methods: An extensive electronic health database search was undertaken to identify all articles that were published up to December 2013 reporting on endograft infection after TEVAR. Overall, 55 patients treated with endograft preservation (group A) and 41 patients treated with endograft explantation (group B) were included in this review.

Results: The most frequently isolated microorganisms were *Streptococcus* species (29.4%) and *Staphylococcus* species (29.4%). The mortality for both groups was 66.6%. The in-hospital mortality rate in group A was 42% and reached 81.8% in a mean follow-up period of 8.6 months. The in-hospital mortality rate in group B was 36.6%. Four (9.7%) further deaths due to reinfection or fistula recurrence were recorded in a mean follow-up period of 15.3 months, leading to an overall mortality of 46.3%. The meta-analysis showed a trend of better outcome with endograft explantation compared with endograft preservation (odds ratio [OR], 0.52; 95% confidence interval [CI], 0.18-1.48). In group A, a trend of better outcome was revealed when drainage and repair of the fistula were applied (OR, 2.22; 95% CI, 0.55-8.90). A trend of worse outcomes was detected in fistula patients compared with nonfistula patients (OR, 1.26; 95% CI, 0.43-3.74).

Conclusions: Endograft preservation seems not a durable option. It can be offered to patients who refuse surgery or as a palliative option or bridging procedure for severely ill patients. Compared with antibiotic therapy alone, antibiotic therapy followed by drainage and repair of the fistula may control the sepsis, providing, however, mainly a temporary benefit. The presence of fistula is a predictor of distal outcome. Endograft explantation remains the "gold standard" of treatment. The mortality rate of surgical conversion is much higher in the presence of fistula. (J Vasc Surg 2014;60:1061-71.)



J Vasc Surg 2014;60:1061



Therapy Review

REVIEW ARTICLE

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- TEVAR
- Group A (TEVAR preservation) 55 pts vs. Group B (explantation) 41 pts
- Overall mortality 66.6%
- Group A: Hospital mortality 42.0%, FU 81.8% (mean 8.5 months)
- Group B: 36.6%, FU 46.3% (mean FU 15.3 months)

Therapy Review

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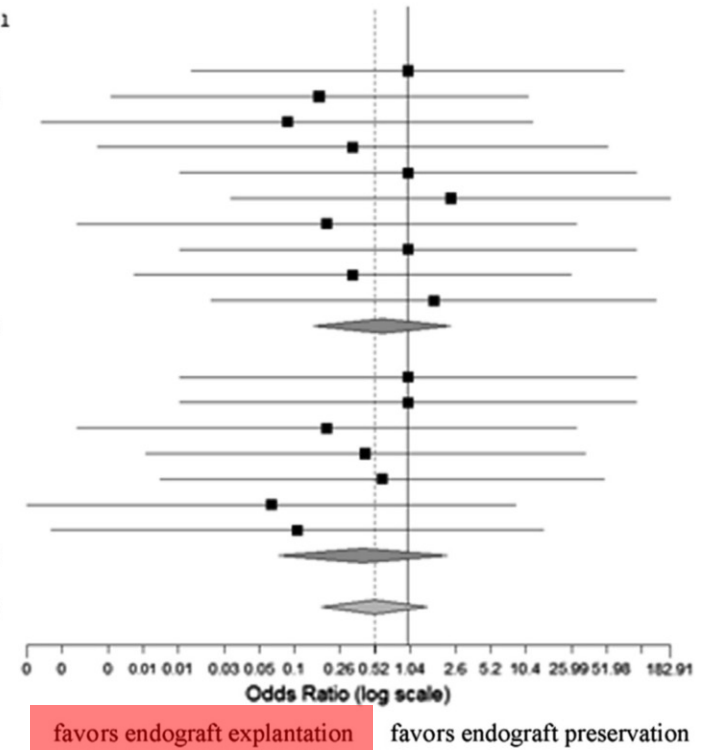
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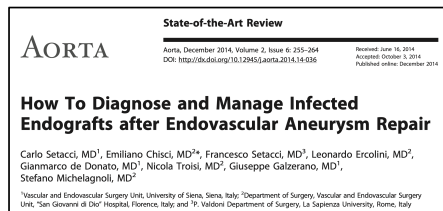
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Studies	Estimate (95% C.I.)	Ev/Trt	Ev/Ctrl
Canaud et al, 2013	1.00 (0.01, 73.26)	2/4	0/0
Chiesa et al, 2010	0.17 (0.00, 10.86)	0/0	14/16
Eggebrecht et al, 2009	0.09 (0.00, 11.88)	0/0	5/5
Fatima et al, 2013	0.33 (0.00, 52.56)	0/1	0/0
Girdauskas et al, 2008	1.00 (0.01, 92.42)	1/2	0/0
LeMaire et al, 2012	2.33 (0.03, 182.91)	3/4	0/0
Lyons et al, 2013	0.20 (0.00, 28.47)	0/0	2/2
Murphy et al, 2013	1.00 (0.01, 92.42)	1/2	0/0
Saito et al, 2012	0.33 (0.00, 25.41)	1/5	0/0
Subgroup 1 (I²=0% , P=0.99)	0.60 (0.16, 2.34)	10/21	21/23
Cernohorsky et al, 2011	1.00 (0.01, 92.42)	0/0	1/2
Fatima et al, 2013b	1.00 (0.01, 92.42)	1/2	0/0
Girdauskas et al, 2008b	0.20 (0.00, 28.47)	0/2	0/0
Heyer et al, 2009	0.43 (0.01, 33.60)	0/0	3/4
LeMaire et al, 2012b	0.60 (0.01, 49.45)	1/3	0/0
Lyons et al, 2013b	0.07 (0.00, 8.55)	0/0	7/7
Murphy et al, 2013b	0.11 (0.00, 14.76)	0/0	4/4
Subgroup 2 (I²=0% , P=0.94)	0.41 (0.08, 2.16)	2/7	15/17
Overall (I²=0% , P=1.00)	0.52 (0.18, 1.48)	12/28	36/40



Therapy

Aorto-enteric fistula



- Rare, often lethal
- Emergency: Over-stenting as a bail out procedure >>> bridge to solution
- Esophageal VAC therapy



Therapy

Aorto-esophageal fistula - Review

Surgery Today
<https://doi.org/10.1007/s00595-019-01937-z>

REVIEW ARTICLE



Aorto-esophageal fistula: review of trends in the last decade

Shinsuke Takeno¹ · Hiroto Ishii¹ · Atsushi Nanashima¹ · Kunihide Nakamura¹

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Abstract

We reviewed articles on aorto-esophageal fistula (AEF) published between January, 2009 and December, 2018. Postoperative aortic disease was the most common cause of AEF, followed by primary aortic aneurysm, bone ingestion, and thoracic cancer. Thoracic endovascular aortic repair (TEVAR) was the most common initial therapy for primary aortic disease, rather than graft replacement. Secondary AEF developed between 1 and 268 months, and between 1 and 11 months after the initial therapy for aortic disease and thoracic cancer, respectively. TEVAR tended to be preferred over surgery for aortic lesions because of its minimal invasiveness and certified hemostasis. In contrast, esophagectomy was preferred for esophageal lesions to remove the infectious source. A combination of surgery for the aorta (TEVAR, graft replacement or repair) and esophagus (esophagectomy, esophageal stent or repair) was usually adopted. Each graft replacement or esophagectomy was associated with a favorable prognosis for aortic or esophageal surgery, and the combination of graft replacement and esophagectomy generally improved the prognosis remarkably. Antibiotic therapy was given to 65 patients, with 20 receiving multiple antibiotics aimed at strong effects and the type of antibiotic described as broad-spectrum in 29 patients. Meropenem, vancomycin, and fluconazole were the most popular antibiotics used to prevent graft or stent infection. In conclusion, graft replacement and esophagectomy can achieve a favorable prognosis for patients with AEF, but strong, broad-spectrum antibiotic therapy might be required to prevent sepsis after surgery.

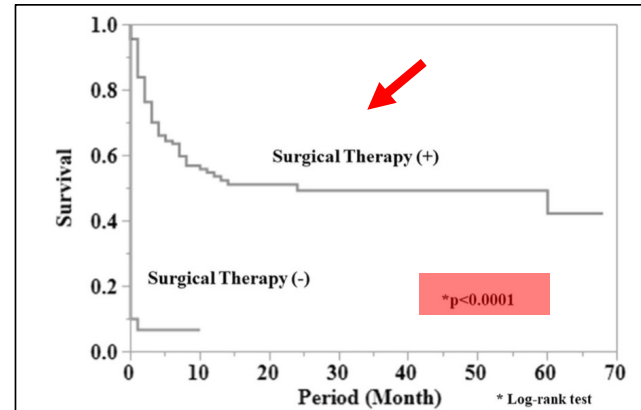


Fig. 3 Patients with aorto-esophageal fistula (AEF) who did not undergo surgical therapy had a significantly worse prognosis than those who underwent some form of surgery

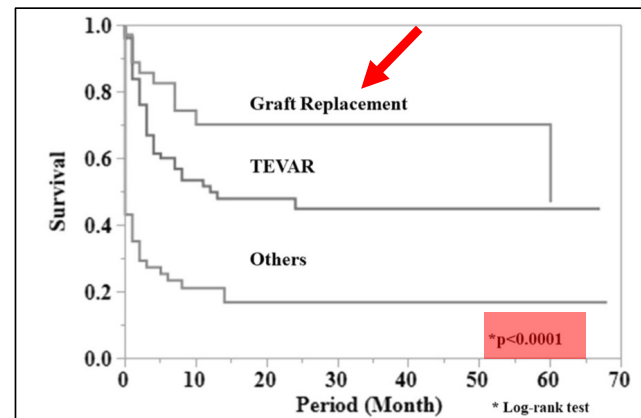


Fig. 4 Patients with aorto-esophageal fistula (AEF) who underwent graft replacement had a significantly better prognosis



Therapy

Aorto-esophageal fistula - Review

Surgery Today
<https://doi.org/10.1007/s00595-019-01937-z>

REVIEW ARTICLE



Aorto-esophageal fistula: review of trends in the last decade

Shinsuke Takeno¹ · Hiroto Ishii¹ · Atsushi Nanashima¹ · Kunihide Nakamura¹

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Abstract

We reviewed articles on aorto-esophageal fistula (AEF) published between January, 2009 and December, 2018. Postoperative aortic disease was the most common cause of AEF, followed by primary aortic aneurysm, bone ingestion, and thoracic cancer. Thoracic endovascular aortic repair (TEVAR) was the most common initial therapy for primary aortic disease, rather than graft replacement. Secondary AEF developed between 1 and 268 months, and between 1 and 11 months after the initial therapy for aortic disease and thoracic cancer, respectively. TEVAR tended to be preferred over surgery for aortic lesions because of its minimal invasiveness and certified hemostasis. In contrast, esophagectomy was preferred for esophageal lesions to remove the infectious source. A combination of surgery for the aorta (TEVAR, graft replacement or repair) and esophagus (esophagectomy, esophageal stent or repair) was usually adopted. Each graft replacement or esophagectomy was associated with a favorable prognosis for aortic or esophageal surgery, and the combination of graft replacement and esophagectomy generally improved the prognosis remarkably. Antibiotic therapy was given to 65 patients, with 20 receiving multiple antibiotics aimed at strong effects and the type of antibiotic described as broad-spectrum in 29 patients. Meropenem, vancomycin, and fluconazole were the most popular antibiotics used to prevent graft or stent infection. In conclusion, graft replacement and esophagectomy can achieve a favorable prognosis for patients with AEF, but strong, broad-spectrum antibiotic therapy might be required to prevent sepsis after surgery.

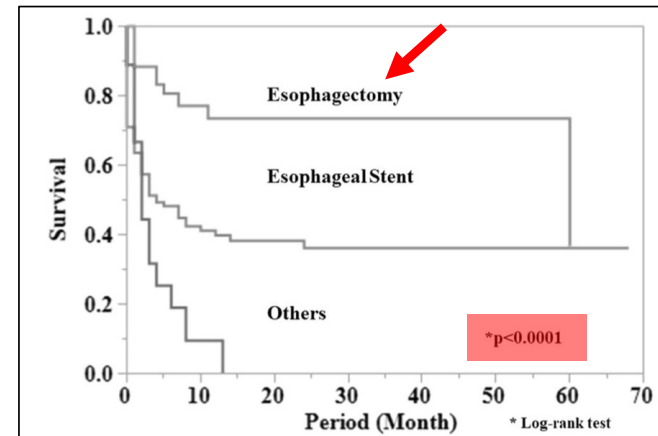


Fig. 5 Patients with aorto-esophageal fistula (AEF) who underwent esophagectomy had a significantly better prognosis

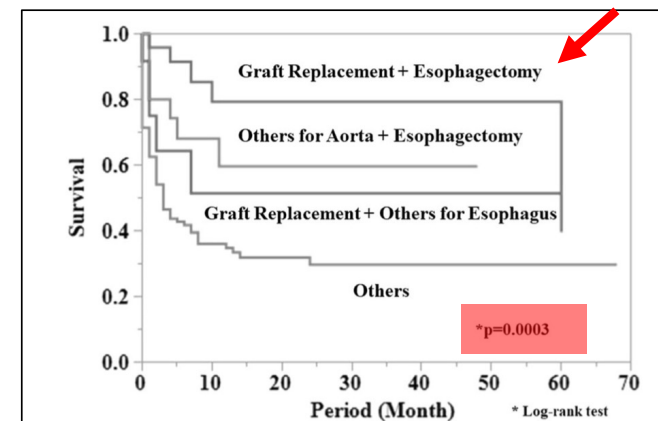


Fig. 6 Patients with aorto-esophageal fistula (AEF) who underwent combined graft replacement and esophagectomy had a significantly better prognosis



Therapy Spondylodiscitis

Archives of Orthopaedic and Trauma Surgery (2022) 142:591–598
<https://doi.org/10.1007/s00402-020-03672-4>

ORTHOPAEDIC SURGERY



Destructive *per continuitatem* spondylodiscitis after endovascular abdominal or thoracic aneurysm repair (EVAR/TEVAR): rare and untreatable?

Marc Dreimann¹ · Yu-Mi Ryang² · Benjamin Schoof¹ · Darius Thiessen¹ · Sven Oliver Eicker³ · Patrick Strube⁴ · Martin Stangenberg¹

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Abstract

Introduction Very few publications have previously described spondylodiscitis as a potential complication of endovascular aortic procedures (EVAR/TEVAR). We present to our knowledge the first case series of spondylodiscitis following EVAR/TEVAR based on our data base. Particular focus was laid on the complexity of disease treatment and grave outcome perspectives from a spine surgeon's point of view in this seriously affected patient group.

Materials and methods A retrospective analysis and chart review was performed for 11 out of 284 consecutive spondylodiscitis patients who underwent EVAR/TEVAR procedure and developed destructive *per continuitatem* spondylodiscitis.

Results All 11 patients had single or more level destructive spondylodiscitis adjacent to the thoracic/lumbar stent graft. In mean, four surgeries were performed per patient to treat this rare complication. Six out of eleven patients (55%) died within 6 months of first identification of *per continuitatem* spondylodiscitis. In four patients due to persisting infection of the graft and recurrence of the abscess formation, a persisting fistula from anterior approach to the skin was applied.

Conclusions Destructive *per continuitatem* spondylodiscitis is a rare and severe complication post-EVAR/TEVAR. Clinical and imaging features of anterior paravertebral disease and anterior vertebral body involvement suggest direct continuous spread of the graft infection to the adjacent vertebral column. The mortality rate of these severe infections is extremely high and treatment with a permanent fistula may be one salvage procedure.

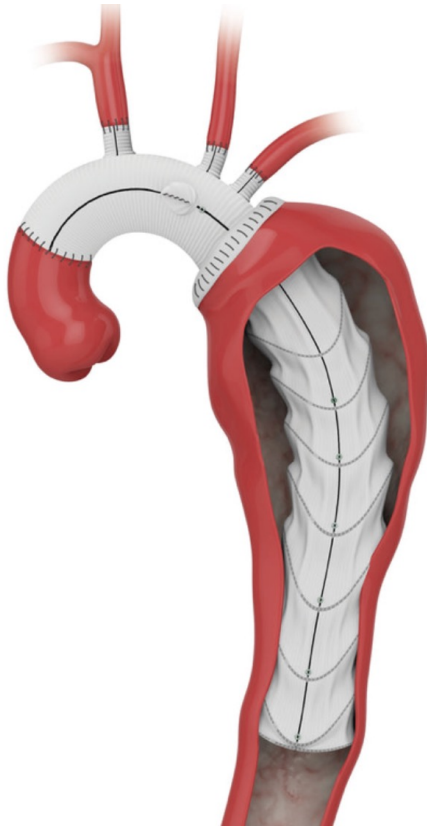
Patient	Age (years)	EVAR/TEVAR	Indication	Time period index surgery to spinal surgery (m)	Number of surgeries	Death
1	69	EVAR	AAA	75	2	x, o.r
2	66	TEVAR	TAA	12	1	–
3	75	EVAR	AAA	12	8	–
4	77	EVAR	AAA	3	3	x
5	51	EVAR	m.AAA	1	4	–
6	49	TEVAR	m.TAA	0	8	x
7	77	EVAR	m.AAA	3	3	–
8	75	EVAR	m.AAA	2	5	x
9	77	EVAR	m.AAA	1	2	x
10	69	TEVAR	TAA	2	2	–
11	73	EVAR	m.AAA	0	4	x

EVAR endovascular aortic repair, TEVAR thoracic endovascular aortic repair, AAA abdominal aortic aneurysm, TAA thoracic aortic aneurysm, m mycotic, (m) months, o.r. death due to other reason, X patient died



Hybrid grafts

Thoraflex Hybrid Graft



Terumo, Vascutek Ltd. Renfrewshire, UK

E-vita Hybrid Graft

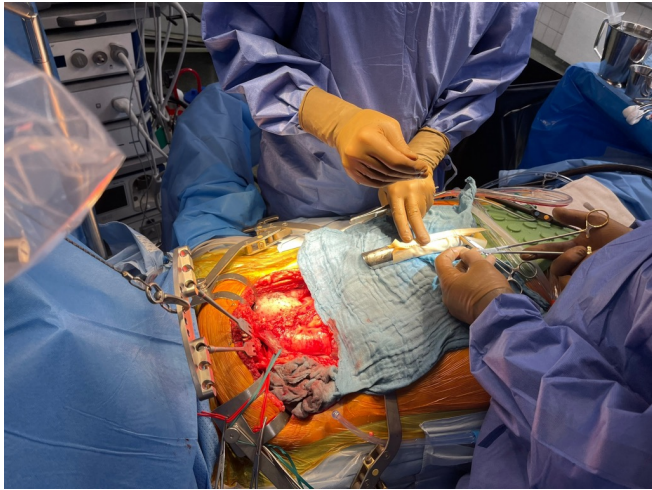


Artivion, GA, USA



Therapy

Infected Hybrid Prosthesis



Outcome Conservative Therapy

448 J ENDOVASC THER
2014;21:448-455

◆REVIEW◆

Outcome After Preservation of Infected Abdominal Aortic Endografts

Konstantinos G. Moulakakis, MD; George S. Sfyroeras, MD; Spyridon N. Mylonas, MD; George Mantas, MD; Anastasios Papapetrou, MD; Constantine N. Antonopoulos, MD; John D. Kakisis, MD; and Christos D. Liapis, MD

Department of Vascular Surgery, Athens University Medical School, Attikon University Hospital, Athens, Greece.

◆◆◆◆◆

Purpose: To review the published outcomes of aortic endograft infection treated with preservation of the stent-graft.

Methods: An extensive electronic health database search was undertaken to identify all articles published up to May 2013 that reported endograft infection after endovascular aneurysm repair (EVAR) in which treatment included preservation of the stent-graft. The search found 17 articles with 29 patients (27 men; mean age 73.1±7.6 years) fulfilling the inclusion criteria.

Results: In 2 (7%) cases, the endograft infection was diagnosed within 30 days of the initial procedure; 4 (14%) were identified within 3 months and the remaining 23 (79%) within 12 months. *Staphylococcus* species, *Streptococcus* species, and *Escherichia coli* were the most common isolated microorganisms. Seven (24%) had a secondary aortoenteric fistula after EVAR. Twelve (41%) patients received only antibiotic therapy, while the remaining had an additional procedure (drainage, surgical debridement, sac irrigation, and/or omentoplasty). The in-hospital mortality was 21% (n=6). During a mean follow-up of 11.4±3.1 months, 7 more patients died (overall mortality 45%). None of the 7 patients with fistula survived. Half (50%) of the 12 patients who received only antibiotic therapy died, while 7 (41%) of the 17 patients who underwent an additional procedure died during follow-up.

Conclusion: Among patients treated for endograft infection without explantation, those with aortoenteric fistula had the worst outcome. There is evidence for lower mortality in patients who underwent an additional procedure, such as drainage, surgical debridement, and sac irrigation. Larger studies are needed to examine the efficacy of this approach compared to surgical conversion with endograft excision and in situ reconstruction or extra-anatomical bypass.

J Endovasc Ther. 2014;21:448-455

- EVAR preservation
- 17 articles >>> 29 pts
- Infection occurred: 30-days: 7%
3 months: 14%
12 months: 79%
- Aorto-enteric fistula: 24%
- 41% ABX only
- 59% additional procedures (drainage, irrigation, debridement, omentoplasty)

Outcome Conservative Therapy

448

J ENDOVASC THER
2014;21:448-455

◆REVIEW◆

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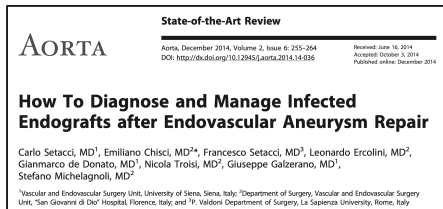
J Endovasc Ther. 2014;21:448-455

- In-hospital mortality 21%
- Overall mortality 45%
(mean FU 11.4 +/- 3.1 months)
- All pts with fistula died



Therapy

Conservative



- *Individual decision (TEVAR/EVAR >> often elderly pts!)*
- *Active bleeding /septic shock >> acute intervention (surgery /TEVAR)*

- High operative risk, fragile, multimorbid
- Antimicrobial treatment (lifetime?)
- Drainage / irrigation /extraction of infected material from the cavity, resection of aneurysmal sack
- **Mortality up to 40%!**





Conclusions

- Endovascular graft infection is rare
- Combination of clinic and different imaging tools to verify the diagnosis
- Surgery is the treatment of choice
- Individual decision based on co-morbidities
- High mortality



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