

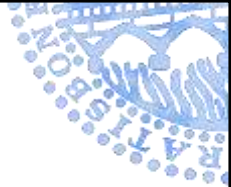
# Infected TEVAR, FEVAR and BEVAR

## - Open Surgery Reloaded



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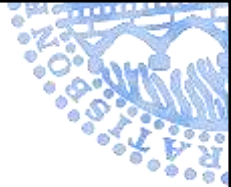
**Disclosures Prof. Dr. Kasprzak (grants, speaker fee, development)  
Cook, Gore, Vascutek, Bard, Medtronic, Maquet, UCB, Bentley**



## Infected TEVAR, FEVAR and BEVAR

|                  | Literature | Regensburg Data       |
|------------------|------------|-----------------------|
| Prosthesis/Graft | 0.5 – 5 %  | -                     |
| Stentgraft       | 0.5 – 2 %  | 0.12 % (UKR: 19/1600) |
| f/b Stentgraft   | ?          | 1.86 % (UKR: 8/430)   |





# Infected TEVAR, FEVAR, BEVAR

- what options do we have?

Heterogenic problems

Elective

Emergency

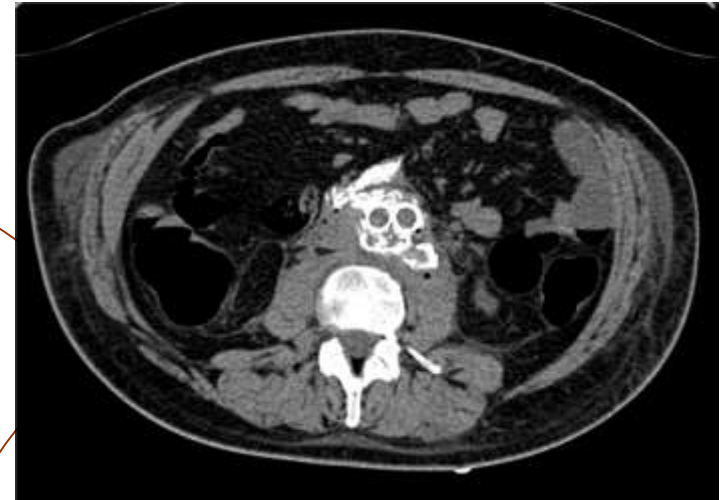
Stentgraf Infection

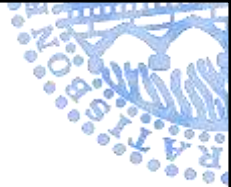
Stentgraft in Infection

Aorto-bronchial Fistula

Aorto-oesophageal Fistula

Aorto-duodenal Fistula





# TEVAR in ruptured TAA

ABF and AEF one week after implantation (post or preop?)



# Infected TEVAR, FEVAR and BEVAR

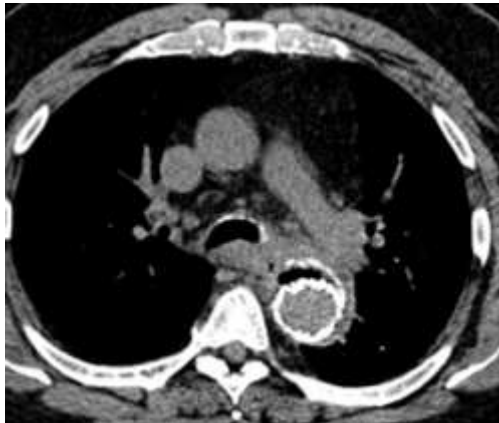
- what options do we have?

Diagnostics

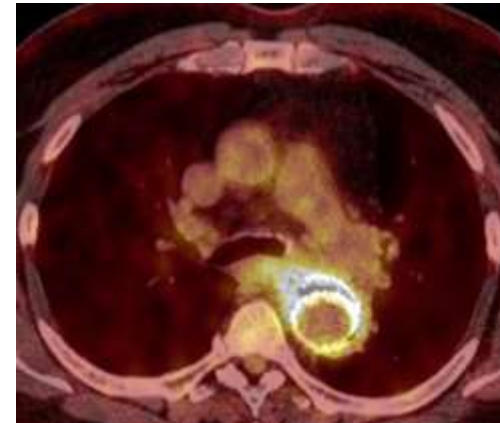
Endoscopy

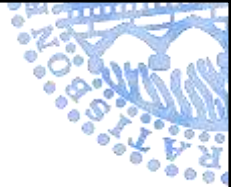


CTA



PET-CT





# Infected TEVAR, FEVAR and BEVAR

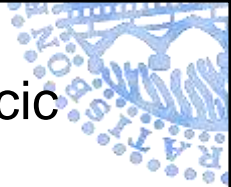
## - what options do we have?

- 17 Departments [1998-2008]
- 19/1113 (1.7 %) TEVAR with AEF/ ± ABF

Table 7 Clinical outcome in patients presenting a post-TEVAR AEF/ABF.

| Pt. | Gender, age | AEF/ABF   | Treatment   | Outcome               |
|-----|-------------|-----------|---|-----------------------|
| #1  | f, 76       | AEF       | Thoracic aorta ligation + extranatomic bypass ("Ventral aorta")   | Death (perioperative) |
| #2  | m, 69       | AEF       | <i>In situ</i> aortic reconstruction + bipolar oesophageal exclusion  | Death (perioperative) |
| #3  | f, 58       | AEF + ABF | Re-TEVAR (immediate) + oesophagectomy and gastric "pull-up" (2 months) + <i>in-situ</i> aortic reconstruction (14 months) | Alive at 30 months    |
| #4  | m, 75       | AEF       | Re-TEVAR  | Death (perioperative) |
| #5  | f, 82       | AEF       | Re-TEVAR + mediastinal drainage   | Death (perioperative) |
| #6  | m, 70       | AEF       | Bipolar oesophageal exclusion   | Death (perioperative) |
| #7  | m, 84       | AEF + ABF | Bipolar oesophageal exclusion + bronchial repair  | Death (at 6 months)   |
| #8  | m, 69       | AEF + ABF | Cervical oesophagostomy   | Death (perioperative) |
| #9  | m, 61       | AEF       | Oesophagectomy + gastric "pull-up"  | Alive at 18 months    |
| #10 | m, 73       | AEF + ABF | Oesophageal stent-grafting  | Death (perioperative) |
| #11 | m, 70       | AEF       | Oesophageal stent-grafting  | Alive at 5 months     |
| #12 | m, 78       | ABF       | No treatment  | Death                 |
| #13 | m, 78       | AEF       | No treatment  | Death                 |
| #14 | m, 83       | AEF       | No treatment  | Death                 |
| #15 | m, 80       | AEF       | No treatment  | Death                 |
| #16 | m, 73       | AEF       | No treatment  | Death                 |
| #17 | m, 75       | AEF + ABF | No treatment  | Death                 |
| #18 | m, 80       | AEF       | No treatment  | Death                 |
| #19 | m, 68       | AEF       | No treatment  | Death                 |

**Mortality 84.2 %**



# Aorto-oesophageal and Aortobronchial Fistulae Following Thoracic Endovascular Aortic Repair: A National Survey

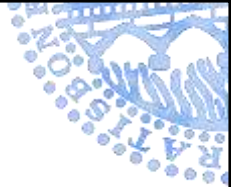
(Chiesa et al. Eur J Endovasc Surg 2010;39:273-279)

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- Conduction of a voluntary national survey among Italian universities and hospital centres with a thoracic endovascular programme with evaluation of the incidence of aorto-oesophageal (AEF) and aortobronchial (ABF) fistulae after thoracic endovascular aortic repair (TEVAR)
- Between 1998 and 2008 19/1113 TEVAR patients developed AEF/ABF (1.7%) .
- Aortic pseudo-aneurysm was associated with the late AEF/ABF (P=0.009).
- Increased risk in emergent and complicated procedures (P=0.008 and P<0.001).
- Eight patients were treated conservatively, all of whom died within 30 days.
- Eleven patients underwent surgical treatment, with a periop mortality of 64% (7/11).







# Infected EVAR and TEVAR

## - what options do we have?

**Surgical strategy in aorto-esophageal fistulae:  
endovascular stentgrafts and in situ repair of the aorta  
with cryopreserved homografts.**



**6 Pat. with AEF**

**all with bridging TEVAR (bleeding)**

**2 Pat. conservative**

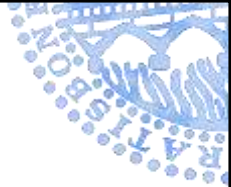
**deceased after 2.3 months**

**4 Pat. two stage  
reconstruction**

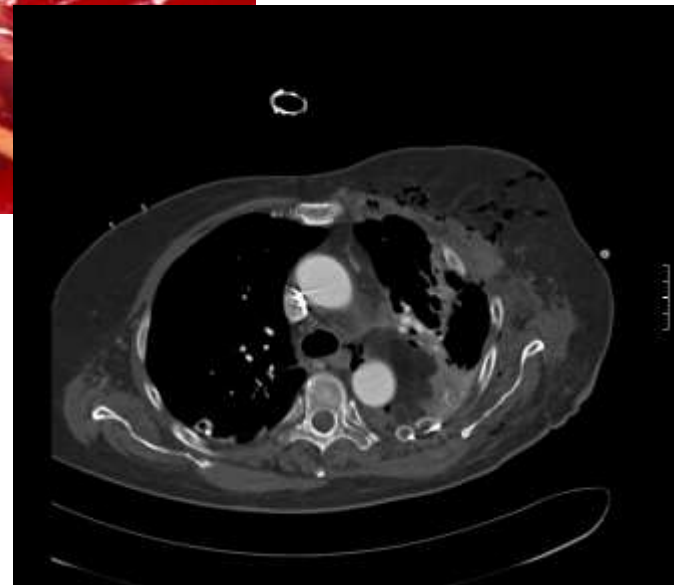
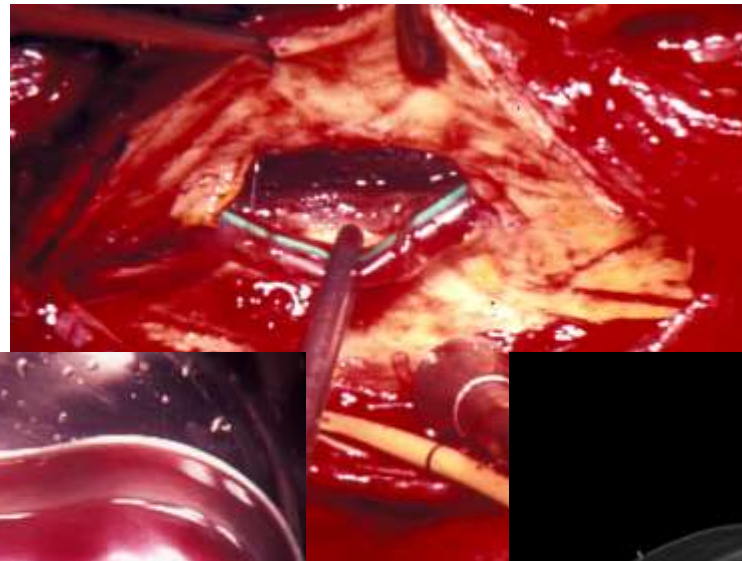
**Resection of Esophagus,  
Stentgraft Explantation, Homograft**

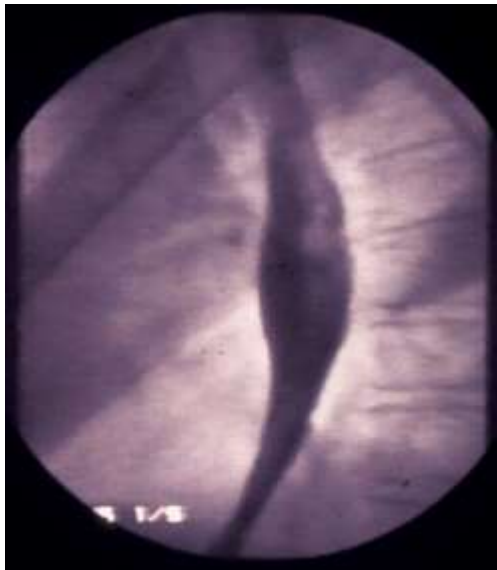
**Survival: 3 / 4 (6) Patients**

Töpel , Kasprzak PI et al. Ann Surg 2007 Nov;246(5):853-9.

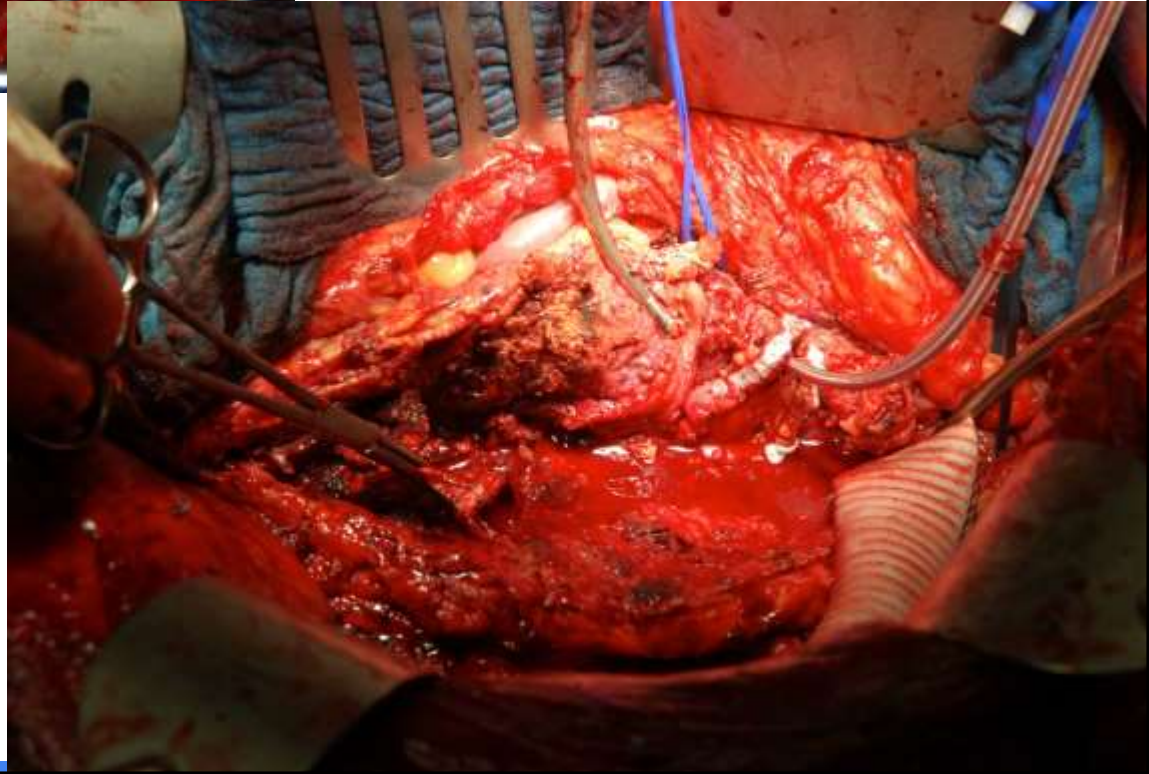
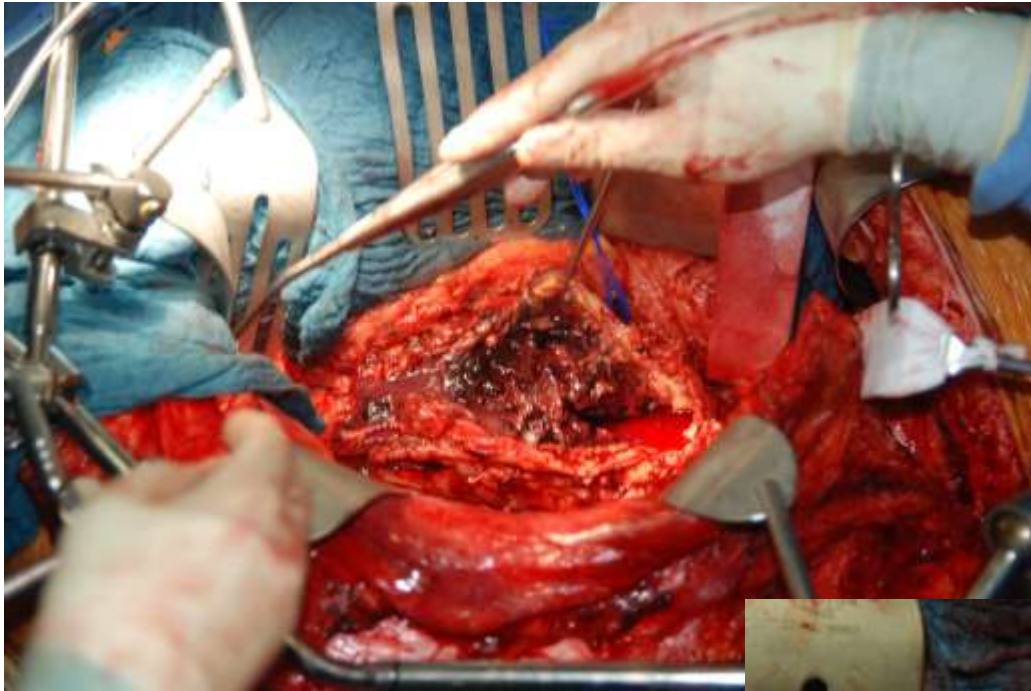


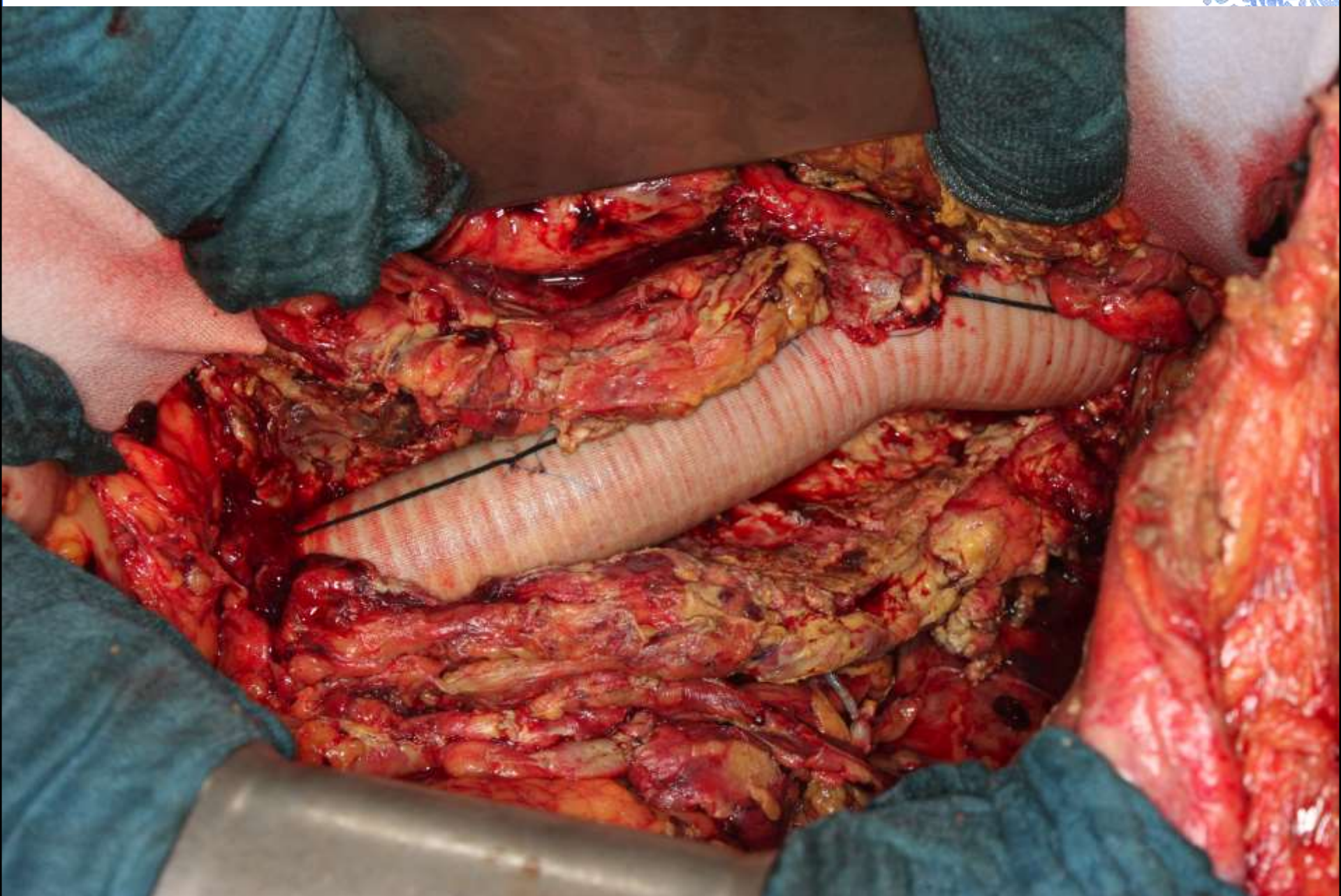
# Aortic reconstruction with homograft and omental flap in AEF

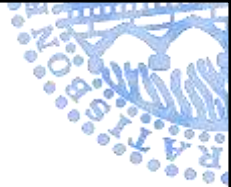








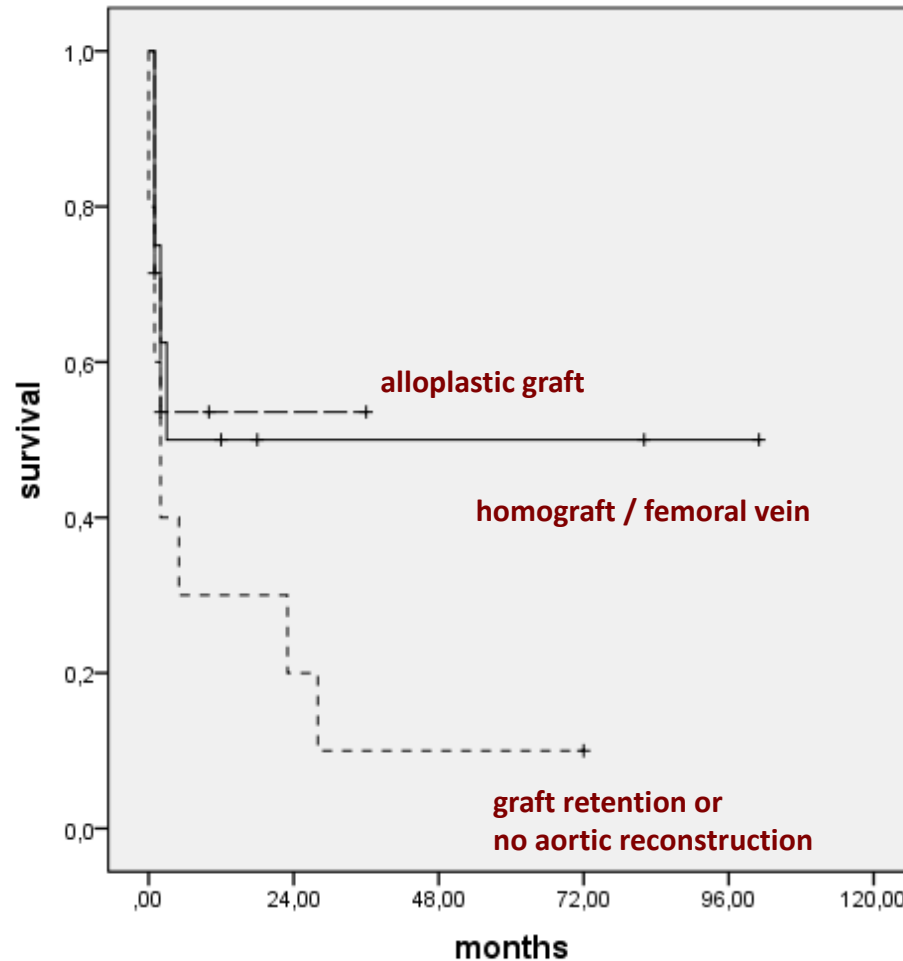


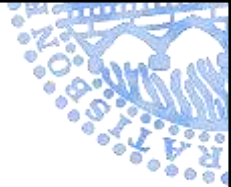


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- what options do we have?

Survival:

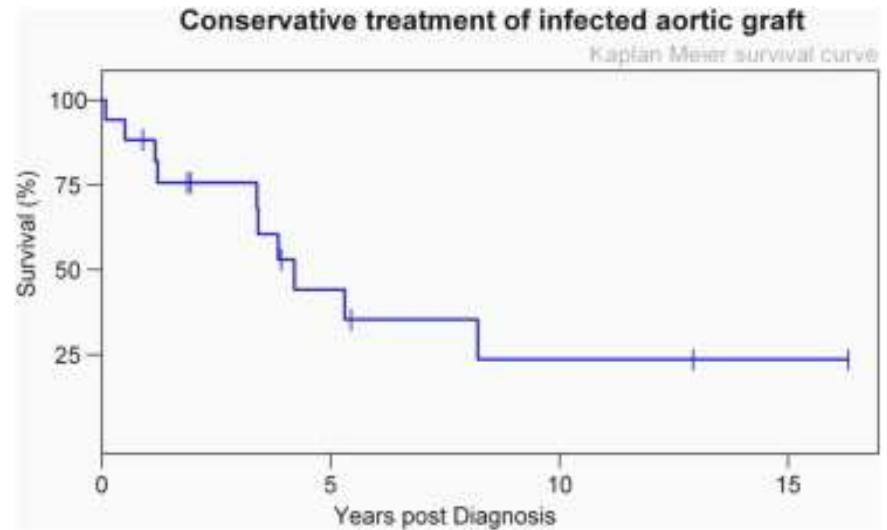




## Alternative treatment of aortic graft infection

- antimicrobial therapy and graft retention

|                                  |                     |
|----------------------------------|---------------------|
| <b>graft retention</b>           | <b>17/18 pts</b>    |
| <hr/>                            |                     |
|                                  | <b>mortality</b>    |
| <b>early mortality (30 days)</b> | <b>0 %</b>          |
| <b>midterm mortality (40 mo)</b> | <b>10/17 (59 %)</b> |
| - graft explantation (n=4)       | <b>3 / 4 (75 %)</b> |



**mean survival time: 57 months**

Mazel MJ et al. Outcomes of infected abdominal aortic grafts managed with antimicrobial therapy and graft retention in an unselected cohort. Eur J Vasc Endovasc Surg 2013; 45(4): 373-80.

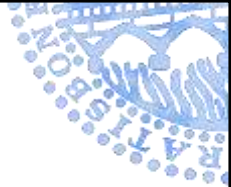


# Infected TEVAR, FEVAR and BEVAR

- what options do we have?

## Influence of Fistulas on Mortality

| Fistula      | %          |
|--------------|------------|
| ADF          | 60         |
| AEF          | 44         |
| ABF          | 25         |
| no           | 29         |
| <b>Total</b> | <b>40%</b> |



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- what options do we have?

UKR

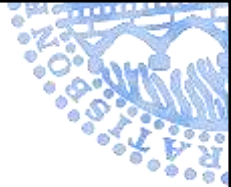
Universitätsklinikum  
Regensburg

## Summary (I)

- Stentgraft infection can be observed in 1% (2%?) of the patients
- Risk population with
  - ABF, AEF and ADF
  - Anastomotic Aneurysms and TAAA
  - Systemic Bacteriemia
  - Frequent Reinterventions
  - sic! Thrombus (dead water zone)

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# Infected TEVAR, FEVAR and BEVAR

- what options do we have?

**UKR**

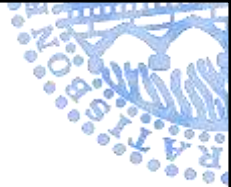
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Regensburg

## Summary (II)

- **high perioperative mortality in:**
  - Emergency / Bleeding
  - Octogenarians
  - Patients with Tu
- **In emergencies (Bleeding) Bridging with Stentgraft**
- **For long term survival total Stentgraft Explantation is the best option**

**UKR**

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## Conclusions

- **selection of low risk patients for aggressive management of aortic stent graft infection remains a challenge**
- **high risk patients might benefit from semiconservative approach with abscess drainage and stent graft retention**
- **tailored long term antimicrobial therapy is recommended although evidence is limited**

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