How we deal with aortic endograft infection

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

I do not have any potential conflict of interest
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Introduction

- ↑endovascular implants = ↑complications
- Endograft infection
  - Incidence 0.2-5%
  - Optimal management:
    - Highly heterogeneous
    - Definitive source control: surgical excision
    - Medical/Surgical
    - Patient/device characteristics

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Risk factors for infection

- Deployment in an infected field
  - Aortic fistulae: enteric/bronchial
  - Aortic ulcer
  - Aortic Pseudoaneurysm
  - Mycotic aneurysm

- Postoperative sepsis

- Aortic procedures: i.e. embolization

- Non-aortic related pathologies
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Purpose

- Define the presentation, management and outcomes of aortic endograft infection at our institution
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Methods

❖ Retrospective review 1/1999-12/2017
❖ Abdominal or thoracic endograft infections
  o Infection during follow-up
  o Aortoenteric/aortobronchial fistulae
  o Mycotic aneurysm
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Methods

Definition of aortic endograft infection:

- MAGIC criteria

<table>
<thead>
<tr>
<th>MAJOR CRITERIA</th>
<th>CLINICAL / SURGICAL</th>
<th>RADIOLOGY</th>
<th>LABORATORY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Fus (confirmed by microscopy) around graft or in aneurysm sac at surgery</td>
<td>Peri-graft fluid on CT scan ≥ 3 months after insertion</td>
<td>Organisms recovered from an explanted graft</td>
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<td>Open wound with exposed graft or communicating sinus</td>
<td>Peri-graft gas on CT scan ≥ 7 weeks after insertion</td>
<td>Organisms recovered from an intra-operative specimen</td>
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<td>Fistula development e.g. aorto-enteric or aorto-bronchial</td>
<td>Increase in peri-graft gas volume demonstrated on serial imaging</td>
<td>Organisms recovered from a percutaneous, radiologically-guided aspirate of peri-graft fluid</td>
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<td>Graft insertion in an infected site e.g. fistula, mycotic aneurysm or infected pseudoaneurysm</td>
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<tr>
<td></td>
<td>Localized clinical features of AGI e.g. erythema, warmth, swelling, purulent discharge, pain</td>
<td>Other e.g. suspicious peri-graft gas/ fluid/ soft tissue inflammation; aneurysm expansion; pseudoaneurysm formation; focal bowel wall thickening; discitis/ osteomyelitis; suspicious metabolic activity on FDG PET/ CT; radionuclide leukocyte uptake</td>
<td>Blood culture(s) positive and no apparent source except AGI</td>
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<td></td>
<td>Fever ≥38°C with AGI as most likely cause</td>
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<td>Abnormally elevated inflammatory markers with AGI as most likely cause e.g. ESR, CRP, white cell count</td>
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Methods

➤ Analysis

- Demographic data and comorbidities
- Indication for index procedure
- Technical factors and possible sources of infection
- Symptoms and Diagnosis
- Treatment
- Mortality
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Results: demographic data

- 21/660 endovascular aortic procedures: 3.2%
- 20 male (95.2%)
- Age 70.4y (47-84y SD: 10.2)
- Comorbidities
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Results: Indications index procedure

- 4 Mycotic
  - 2 abdominal
  - 2 thoracic

- 5 Ao fistulae
  - 1 Ao-aesophageal
  - 1 Ao-bronchial
  - 3 Ao-enteric

- 12 Ao
  - 1 TA Ao dissection
  - 7 AAA
  - 1 juxtarenal AA
  - 2 TA Ao A
  - 1 Thoracic An
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Results: Indications index procedure

4 Mycotic

- 2 abdominal/2 EVAR
- 2 thoracic/2 TEVAR

5 Ao fistulae

- 1 Ao-aesophageal/1 TEVAR
- 1 Ao-bronchial/1 TEVAR
- 3 Ao-enteric/3 AUI EVAR

12 Ao

- 1 TA Ao dissection/1 TEVAR
- 7 AAA/2 AUI, 5 BIF
- 1 juxtarenal AA/1 FEVAR
- 2 TA Ao A/2 BEVAR
- 1 Thoracic An/1 TEVAR
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Results: Tq factors & Source of infection

4 Mycotic

5 Ao fistulae

12 Ao

- 2 Infection at PO index operation
- 2 Endoleak II embolisation
- 3 Interval procedures: i.e. colonoscopy
- 2 interval known infection
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Results: Symptoms & diagnostic

Symptoms:
- Fever 57%
- Pain 38.2%
- Toxic syndrome 28.6%
- Aortic fistulae 23.8%
- Groin abscess 9.5%

Diagnostic:
- micro
- CT scan
- PET scan
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Results: Symptoms & diagnostic

- T to infection: 24.3 months (0-128m SD: 39.3)

- 4 Mycotic
  - 3m: 0.2-6m
  - SD: 2.9

- 5 Ao fistulae
  - 0.07m: 0-0.17
  - SD: 0.09

- 12 Ao
  - 41.5m: 0.3-128m
  - SD: 45.4
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Results: Treatment

4 Mycotic
- 2 medical treatment
- 1 explant/in situ
- 1 debridement

5 Ao fistulae
- 5 medical treatment

12 Ao
- 4 medical treatment
- 6 explant/extranatomic
- 1 TEVAR
- 1 debridement
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Results: Mortality

- Follow-up: 22.1 months (0.5-71m SD: 22.7)

4 Mycotic
- 1y: 50%
- 2y: 50%

5 Ao fistulae
- 1y: 60%
- 2y: 80%

12 Ao
- 1y: 16.7%
- 2y: 41.7%
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Comments

- Indication of index procedure highly determines kind of aortic endograft infection

- Time to presentation depends mainly on etiology of infection

- Kind of treatment depends on
  - Patient characteristics
  - Kind of infection
  - Device characteristics
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