UPDATE ON TREATMENT OF MYCOTIC AAAS AND INFECTED EVARS: USE OF EVAR FOR MYCOTIC AAAS, AND WHEN IS NON-EXCISION OF INFECTED EVARS ACCEPTABLE TREATMENT

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DISCLOSURES

I have nothing to Disclose

DIAGNOSIS OF INFECTED ANEURYSMS

- Positive blood culture specimen
- First presentation of an aneurysm after bacterial sepsis
- Positive culture from aneurysmal wall, its content or the surrounding tissue with an associated infection
- Positive Polymerase Chain Reaction (PCR)
- Negative culture with
  - Image finding of eccentric aneurysms
  - Signs of infection
  - Preoperative treatment with antibiotics


PRINCIPLES OF OPERATIVE TREATMENT

- Antibiotics: initial and long term
- Prompt surgical treatment: rupture risk
  - Excision of infected artery
  - Removal of surrounding infected tissue
- Arterial reconstruction
  - In-situ graft replacement
  - Extra-anatomical bypass
- Appropriate postoperative antibiotics

ENDOGRAFTS FOR THE TREATMENT OF INFECTED AORTIC ANEURYSMS

- An alternative to open surgery
- Less invasive, rapid aneurysm exclusion
- Prompt control of bleeding in the face of hemodynamic instability
- The better choice for critically ill patients with hostile abdomen

THE SUCCESSFUL USE OF EVAR IN MYCOTIC AORTIC ANEURYSMS

- Broad – spectrum antibiotics are administered as soon as a mycotic aneurysm is suspected
- No microbes could be isolated from blood and tissue cultures in 25% to 40% of mycotic aortic aneurysms
- The use of antibiotic-coated grafts to reduce the source of infection
- Adjunct procedures such as surgical debridement or percutaneous drainage are important to eliminate the source of infection
- Prolonged postoperative antibiotic therapy is a key component to success

THE ROLE OF EVAR FOR TREATMENT OF INFECTED AORTIC ANEURYSMS

• Well-controlled of an active infection by broad-spectrum antibiotics and with the patient without fever and with stable hemodynamic parameters
• Acute presentation with fever, positive blood culture, active bleeding and hemodynamic instability from aneurysm rupture

CHIANG MAI UNIVERSITY REVIEW (FROM JANUARY 2009 DECEMBER 2011)

Elective Open repair for stable infected AAAs
All 5 cases (1 E. coli, 1 B. pseudomallei and 3 Salmonella)
• No operative and 30 days mortality
• Significant postoperative complications 40%
  -Renal failure, MI, respiratory failure, etc
• Surgical complications 21%
  -Bleeding, wound, ischemic colitis, etc

All survived patients have a lifelong antibiotics treatment


CHIANG MAI UNIVERSITY REVIEW (FROM JANUARY 2009 DECEMBER 2011)

Emergency EVAR for un-stable infected AAAs

Emergency Open repair for un-stable infected AAAs

All 5 cases had Salmonella infection with 30 days mortality rate of 60 % (3/5)

All survived patients have a lifelong antibiotics treatment


ENDOVASCULAR STENTING FOR PATIENTS WITH INFECTED AAA

• Placement of the stent-graft in an infected aneurysm
• Does not resolve infection or treat complications
• May have a role in excluding aorto-enteric fistula, temporizing for open surgery at a later date and palliation in the critically ill patients

WHEN ARE ENDOGRAFTS EFFECTIVE TREATMENT FOR MYCOTIC AAAS

• Good immediate results with no 30 days mortality and few complications
• Persistent infection after EVAR has a high rate of Infected Stent Grafts (ISG) 20-33.33%
• EVAR is not a definitive treatment of MAA : it is a bridging treatment prior to definitive open surgical repair

HOW TO TREAT INFECTED ENDOGRAFTS AFTER EVAR

INFECTED AORTIC GRAFTS

- Conventional open repair of AAA has a graft infection rate of 0.5% to 3%
- EVAR has a graft infection rate of 0.2-5% (0.43%)
- EVAR for Infected AAAs has a graft infection rate of 33.33% (3/9) in our series

MECHANISM OF GRAFTS INFECTIONS

- Contamination at the time of implantation
- Early postoperative septicemia (incisional site or remote infection)
- Hematogenous spread
- Adjacent infection such as diverticular abscess
- Re-intervention

TABLE 1. PATIENT DEMOGRAPHIC, MANAGEMENT AND OUTCOMES

<table>
<thead>
<tr>
<th>Case</th>
<th>Age/Gen</th>
<th>Pathogens</th>
<th>Endograft</th>
<th>Interval, (months)</th>
<th>Second Procedure</th>
<th>Third Procedure</th>
<th>Followup</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71/M</td>
<td>Salmonella</td>
<td>Zenith</td>
<td>10</td>
<td>CT guided percutaneous drainage</td>
<td>Salmonella</td>
<td>24 months, Alive</td>
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<tr>
<td>2</td>
<td>57/M</td>
<td>Pseudomonas</td>
<td>AneuRX</td>
<td>36</td>
<td>CT guided percutaneous drainage, No Growth</td>
<td>Dacron Graft</td>
<td>10 months, Alive</td>
</tr>
<tr>
<td>3</td>
<td>58/M</td>
<td>E.coli</td>
<td>Zenith</td>
<td>26</td>
<td>CT guided percutaneous drainage, E.coli</td>
<td>No, refused an operation</td>
<td>Died 1 month later from Sepsis and GI bleeding</td>
</tr>
<tr>
<td>4</td>
<td>42/M</td>
<td>E. fragilis/E. coli</td>
<td>Medtronic</td>
<td>13</td>
<td>No</td>
<td>Exploration - Infected Iliac</td>
<td>8, Alive</td>
</tr>
</tbody>
</table>

THE PRIMARY GOALS AND PRINCIPLE OF SURGICAL TREATMENT (MORTALITY RATES 4-30%)

- Removal of the infected prosthesis
- Debride all infected soft tissue
- Restored blood flow to the lower extremities and visceral arteries
- Prevent recurrent infection of the new grafts -specific antibiotics
- CT imaging for follow-up

WHEN IS NON-EXCISION OF INFECTED EVARS ACCEPTABLE TREATMENT
MAJOR AND MINOR CRITERIA FOR AORTIC GRAFT INFECTION

<table>
<thead>
<tr>
<th>Major Criteria</th>
<th>Minor Criteria</th>
<th>Technical</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organism recovered from an explanted graft</td>
<td>Positive blood cultures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organism recovered from an intra-operative specimen</td>
<td>Positive blood cultures and serosal fluid collections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organism recovered from a percutaneous, radiography-guided aspirate of periprosthetic fluid</td>
<td>Positive blood cultures and serosal fluid collections</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONSERVATIVE MANAGEMENT

- High mortality rates 75 -100%
- Combined with endoluminal devices should be used as a bridge to definitive operative treatment
- Considered in patients with Moribund High risk for operation Minimal graft contamination by a low grade virulent organisms

CONSERVATIVE TREATMENT OF ENDOGRAFT INFECTION AFTER EVAR WITH CT GUIDED DRAINAGE AND GRAFT PRESERVATION:

- Bacterial Virulence
- Onset of Endograft Infection
- Localization of Endograft Infection
- Initial Response to CT guided percutaneous drainage

WHEN IS NON-EXCISION OF INFECTED EVARS ACCEPTABLE TREATMENT:

- Conservative management (percutaneous drainage, antibiotics irrigation, and intravenous antibiotics) can improve the systemic sepsis temporarily
- Considered in patients with Moribund High risk for operation Minimal graft contamination by a low grade virulent organisms
THANK YOU FOR ATTENTION