Thoracic Endograft infection

- Graft infection after EndoVascular Aneurysm Repair (TEVAR) is an under-recognized and underreported entity.

- The incidence of thoracic stent-graft infection ranges from 1.53% to 4.77%.

- Thoracic endograft infections are associated with a considerable mortality that exceeds 70% in the largest published series.

Pathogenesis

- Patient Related
  - Bacterial inoculation during the procedure
  - Pre-existing mycotic aneurysm could result in intestinal necrosis and fistula formation
  - Remote source of sepsis (e.g., endocarditis, pneumonia, urinary tract infection)
  - Cancer or immunodeficiency

- Stent Graft Related
  - Repeated secondary procedures
  - Stent migration
  - Fabric rupture
  - Erosion of the aorta by the hooks and barbs
  - Endoleak and endotension may lead to aorto-enteric fistula formation

Clinical Presentation

- Low grade infection
- Systemic Sepsis
- Fistula (aortoesophageal or bronchial) (38%)
- Chest Pain
- Abscess (periaortic)
- Pseudomonalus
- Pneumonia, mediastinitis

Microorganisms Involved

Bacterial cultivations were negative in 32% of the patients.

- St. Aureus 29.4%
- Streptococcus sp. 29.4%
- Candida Albicans 4%
- Pseudomonas Aeruginosa 4%
- Enterobacter cloacae 4%
- More than one species 16%
Management of Infected Thoracic Endograft

Depends on:
1. Patient's clinical status
2. Co-morbidities
3. Presence of preoperative sepsis
4. Microorganisms involved

Graft Excision is the GOLD STANDARD
- Graft Excision & Extra-anatomic bypass
- In Situ Aortic Graft Replacement (Homograft, Silver Graft)
- Esophagectomy, esophageal stenting, and lung resection are adjunctive procedures.

Variable results on Mortality and Re-infection rates
- 35% - 80%
- 15% - 35%

High mortality and morbidity rates, especially when undertaken in unstable, septic patients with severe comorbidities

The Graft Must Come Out: What If It Can't?
Is there an alternative option?

Endograft preservation vs endograft explantation

Conservative treatment group: In-hospital mortality 42%
Follow-up (6.6 months) mortality 12.3%
OR Group: In-hospital mortality 36.6%
Follow-up mortality (15.3 months) 46.3%
OR, 0.52, 95% CI, 0.18-1.98.

Additional treatment vs. none in patients treated with endograft preservation

Broad-spectrum antibiotics if thoracic endograft infection is suspected
Prolonged antibiotic therapy

Combination of antibiotics with additional procedures, may control or resolve the sepsis, providing, however, mainly a temporary benefit OR 2.22, 95% CI, 0.55-8.90

Comparison of treatment strategies for thoracic endograft infection

END-POINTS
1. Endograft explantation vs endograft preservation
2. Additional treatment vs. none in patients treated with endograft preservation
3. Presence of fistula vs absence of fistula

Review Metaanalysis

Group A: 55 pts treated with endograft preservation
Group B: 41 pts treated with endograft explantation (group B)

Conservative treatment group: In-hospital mortality 42%
Follow-up (8.6 months) mortality 81.8%
OR Group: In-hospital mortality 36.6%
Follow-up mortality (15.3 months) 46.3%
OR, 0.52, 95% CI, 0.18-1.98.


A trend of worse outcomes was detected in fistula patients compared with nonfistula patients (OR, 1.26; 95% CI, 0.43-3.74).

**Presence of fistula vs absence of fistula**

**Predictors of perioperative mortality and fatal infection complications in pts treated conservatively**

- Presentation with severe sepsis
- Periaortic/intrathrombus gas on preoperative CT scan
- Positive blood cultures
- Immunodeficiency
- Presence of fistula
- Not good response to antibiotic therapy

**CASE: 75y/o M Cevere 3 vessel CAD**

- Fever up to 39 °C
- Leukocytosis
- ↑ CRP
- Thoracic pain
- Blood cultures (-) After 3 Days

- TAA Diameter Increased

**TEVAR VALIANT, MEDITRONIC**

**After 3 Months**

- Fever up to 39 °C
- Leukocytosis
- ↑ CRP

- Esophagectomy, Gastric pull AND debridement of the sac

- Discharged on Clexacillin and Rifampycin

**At 4 Months post-op, afebrile with no evidence of Infection**
Conclusions I

- The gold standard of treatment for THORACIC endograft infection remains endograft explantation with arterial reconstruction, debridement, and repair of the fistula if present.
- The mortality rate of surgical conversion is much higher in the presence of AEF or ABF.
- The option to preserve the endograft in combination with additional procedures and long term antibiotics, may control or resolve the sepsis, providing, however, mainly a temporary benefit.

Conclusions II

- It can be offered to patients who refuse surgery or to severely ill pts who are not candidates for more aggressive surgery, as a palliative option.
- It can also be considered as a bridging solution for septic, hemodynamically unstable patients until their general status is improved.
- The presence of fistula is a predictor of dismal outcome in pts treated conservatively.

Thank you for your attention