Endocarditis of the mitral valve: repair vs replacement

Case n. 03 – Endocarditis Session
June 16th 2016
CardioCentro Ticino
Lugano
Tiziano Torre
I have no actual or potential conflict of interest in relation to this program/presentation.
Endocarditis of the mitral valve: repair vs replacement

28 years-old lady
History of heroin and cocaine abuse (treated with methadone)
Recent onset of migraine and fever (≥ 38.5 °C) → Hospitalization
CRP 188 mg/L  WBC 17.400/mm3
Large spectrum antibiotic therapy (ceftriaxone, amoxicillin, vancomycin)
Blood cultures positive for *Staphilococcus aureus*
Switch to fluoxacillin antibiotic therapy
Negative Cerebral CT scan
TTE: Vegetation on Mitral Valve posterior leaflet (Ø 2 cm)
   Moderate Mitral regurgitation due to posteromedial comissure erosion.
Transfer to CardioCentro Ticino
Preoperative Trans oesophageal echocardiography

Vegetation (Ø 3 cm) on P3
Posterior paravalvular abscess (posteromedial commissure)
P3 basal perforation
Severe mitral regurgitation
EF 60%
Surgery

Trans-septal approach to left atrium:

- Debridement of the mitral annulus
- Resection of P3 and replacement by Corematrix® patch
- Posteromedial commissure plication

No ring annuloplasty

Mitral Valve repair
### Post-operative

- No hemodynamic support after surgery
- Rapid weaning from mechanical ventilation
- Transfer to the ward on postoperative day 1
- No postoperative complications
- Discharge on postoperative day 6
- Transfer to referral hospital
- 6 weeks of antibiotic treatment with fluoxacillin
Discharge

Mild residual mitral regurgitation
EF 60%

TTE at discharge
Surgical indications for Valve Endocarditis

- Heart Failure
- Uncontrolled infection
- Prevention of embolism

- Emergency within 24 h
- Urgency within a few days (< 7)
- Elective after 1-2 weeks of antibiotic therapy

Habib G. et al, 2015 ESC Guidelines for the management of infective endocarditis
European Heart Journal 2015
Surgical indications

<table>
<thead>
<tr>
<th>Indications for surgery</th>
<th>Timing</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Heart failure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock</td>
<td>Emergency</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance</td>
<td>Urgent</td>
<td>I</td>
<td>B</td>
</tr>
</tbody>
</table>

HF is the most frequent (42-60%) and severe complication of IE. The presence of HF is an indication for early surgery, even in patients with cardiogenic shock.
### Indications for surgery

<table>
<thead>
<tr>
<th>Indications for surgery</th>
<th>Timing</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)</td>
<td>Urgent</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Infection caused by fungi or multiresistant organisms</td>
<td>Urgent/elective</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci</td>
<td>Urgent</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>PVE caused by staphylococci or non-HACEK gram-negative bacteria</td>
<td>Urgent/elective</td>
<td>IIa</td>
<td>C</td>
</tr>
</tbody>
</table>

The presence of locally uncontrolled infection is an indication for urgent surgery in patients with IE.
Embolism is very frequent in IE, complicating 20–50% of cases, but falling to 6–21% after beginning of antibiotic therapy. Neurological events in 15–30% of all patients with IE.
Six factors associated with an increased embolic risk.

«The benefits of surgery to prevent embolism are greatest during the first 2 weeks of antibiotic therapy.»

Hubert S et al., J Am Coll Cardiol 2013;62:1384-1392
Predictors of outcome

- Heart failure
- Periannular complication
- St. aureus infection

All 3: 79% risk of death

San Roman JA et al., Am J Med 2007;120:367-39
Repair is favoured whenever possible.

Primary objectives of surgery:

- Total removal of infected tissue
- Reconstruction of cardiac morphology (repair or replacement)

Habib G. et al, 2015 ESC Guidelines for the management of infective endocarditis
European Heart Journal 2015
The Task Force recommends a tailored approach for each individual patient.

The use of foreign material should be kept to a minimum.

Early operation has been associated with a repair rate of 61-80%.

Mechanical and biological prostheses have similar op. mortality.

Habib G. et al, 2015 ESC Guidelines for the management of infective endocarditis European Heart Journal 2015
Patients surviving a first episode of IE have a significantly worse survival.

<table>
<thead>
<tr>
<th>Years</th>
<th>Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>80 – 90%</td>
</tr>
<tr>
<td>2 years</td>
<td>70 – 80%</td>
</tr>
<tr>
<td>5 years</td>
<td>60 – 70%</td>
</tr>
</tbody>
</table>
Recurrence of Infective Endocarditis

Actual risk of recurrence of infective endocarditis after surgery is approximately 2 – 6%

2 types:
- Relapse (≤ 6 months) – same microrganism
- Reinfection (≥ 6 months) ≠ microrganism

## Causes of relapse

### Factors associated to increased risk of relapse

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate antibiotic treatment</td>
<td>(agent, dose, duration)</td>
</tr>
<tr>
<td>Resistant microorganisms</td>
<td>i.e. Brucella spp., Legionella spp., Chlamydia spp., Mycoplasma spp., Mycobacterium spp., Bartonella spp., Coxiella Burnetii, fungi</td>
</tr>
<tr>
<td>Polymicrobial infection</td>
<td>in an IVDA</td>
</tr>
<tr>
<td>Empirical antimicrobial therapy</td>
<td>for BCNIE</td>
</tr>
<tr>
<td>Periannular extension</td>
<td></td>
</tr>
<tr>
<td>Prosthetic valve IE</td>
<td></td>
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<tr>
<td>Persistent metastatic foci</td>
<td>of infection (abscesses)</td>
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<tr>
<td>Resistance to conventional antibiotic regimens</td>
<td></td>
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<tr>
<td>Positive valve culture</td>
<td></td>
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<tr>
<td>Persistence of fever</td>
<td>at the seventh postoperative day</td>
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<tr>
<td>Chronic dialysis</td>
<td></td>
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</tbody>
</table>

**BCNIE** = blood culture-negative infective endocarditis

**IE** = infective endocarditis

**IVDA** = intravenous drug abuser.
A new chapter

After first operation → Heroin and methadone abuse relapse

6 Months later: Migraine and epileptic auras

CT scan positive for septic microemboli: cerebral and arms

New hospitalization

TEE: Severe mitral regurgitation due to endocarditis

Blood cultures: negative

« … a new storm on the horizon »

Transfer to CardioCentro Ticino
Preoperative TTE

2 Vegetations:
Ø 26 mm on Post. Leaflet
Ø 16 mm on Ant. Leaflet
Severe mitral regurgitation
EF 57 %
Cannulation:
Right femoral artery, right jugular and femoral veins

Intraoperative findings:
• Vegetation on P3 (Corematrix®) and posteromedial commissure
• No new abscess

Mitral repair:
• Resection of Corematrix® patch
• P2 sliding
• Posteromedial commissure plication
• Annuloplasty ring (CE Physio II 32 mm)
### Post-operative

- No hemodynamic support after surgery
- Rapid weaning from mechanical ventilation
- Transfer to ward on postoperative day 1
- 1st degree AV block / Sinus rhythm
- Discharge on postoperative day 7
- Transferred to referral hospital
- 6 weeks of antibiotic treatment with fluoxacillin
Mild residual mitral regurgitation
\( \Delta P \, 13/6 \, \text{mmHg} \)
EF 57%
PCR rRNA on valve specimens positive for St. aureus
Conclusions

Multiple repair of mitral valve endocarditis is feasible especially when the patient is in childbearing age. Whenever possible repair is the treatment of choice. In case of extensive destruction of the mitral valve, replacement is recommended to avoid unsatisfactory repair.
THANK YOU
for your attention