An unusual case of
Infective Endocarditis

Gilbert Habib
La Timone Hospital
Marseille - France

February 13th, 2016
Endocarditis: still a deadly disease!!

Meta-analysis from 24 studies including 8539 patients

- still high mortality
- benefit of early surgery

Thuny F, Habib G. Lancet 2012;10;379:965-75
Endocarditis: still a deadly disease!!

Meta-analysis from 24 studies including 8539 patients

WE NEED

- early diagnosis
- early ATB therapy
- early surgery

Thuny F, Habib G. Lancet 2012;10;379:965-75
Case report

History of the disease

- 71 year-old man
- mitral bioprosthesis 2000
- severe Parkinson disease
- valve-in-valve MV replacement (transapical) June 2015
- October 2015: fever / suspected endocarditis

Clinical examination

- CHF
- systolic murmur 2/6
- blood pressure: 100/70 mmHg
- arrhythmia (atrial fibrillation)
Case report

Laboratory data

- haemoglobin: 9 g / dl
- white blood cell: 13,000 / mm³
- CRP = 130 mg/l
- creatinin = 125 mg/l
- BNP = 1100 ng/l

Blood cultures: Staphylococcus Methi-R (x 3)
TEE October 14th, 2015
What is your diagnosis?

1. Bioprosthetic Valve-in-valve endocarditis?
2. Pericardial effusion?
3. LV aneurysm?
4. LV false aneurysm?
cardiac CT scan

Mitral annulus pseudo-aneurysm

Apical false aneurysm
18FDG-PET-CT November 4th

Uptake on the prosthesis

Uptake on the apical LV false aneurysm
What is your diagnosis?

1. Bioprosthetic Valve-in-valve endocarditis
2. Pericardial effusion
3. LV aneurysm
4. LV false aneurysm
Decision and management

1. **Definite IE**

2. **Initiation of antibiotic therapy**
   - *initially:* Vancomycin with Gentamycin:
   - *then:* Cotrimoxazole with Clindamycin

3. **follow-up**
   - repeat TEE
   - repeat CT scan
Evolution under ATB therapy

October 14th, 2015

October 30th, 2015
Evolution under ATB therapy

October 14th, 2015

October 30th, 2015
Evolution under ATB therapy

October 14\textsuperscript{th}, 2015

October 30\textsuperscript{th}, 2015
Pulsatile false aneurysm
What is your management?

1. Antibiotic therapy alone?
2. Emergency surgery?
3. Elective surgery?
4. Other?
2014

**AHA Scientific Statement**

**Infecetive Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications**

**A Scientific Statement for Healthcare Professionals From the American Heart Association**

Endorsed by the Infectious Diseases Society of America

Larry M. Baddour, MD, FAHA; Chair; Walter R. Wilson, MD; Arnold S. Bayer, MD; Vance G. Fowler, Jr., MD, MHS; Iman M. Tojyeh, MD, MSc; Michael J. Rybak, PharmD, MPH; Bruno Baricic, MD, PhD; Peter B. Lockhart, DDS; Michael H. Geszitz, MD, FAHA; Matthew J. Lefson, MD; Ann F. Bolger, MD, FAHA; James M. Stockelberg, MD; Robert S. Baltimore, MD; Anne M. Fink, PhD; RN; Patrick O'Gara, MD, FAHA; Kathryn A. Thauber, PhD, FAHA; on behalf of the American Heart Association Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease of the Council on Cardiovascular Disease in the Young, Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and Stroke Council

2015

2015

**2015 ESC Guidelines for the management of infective endocarditis**

The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC)

Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM)
Chairperson
Gilbert Habib
France

Co-Chairperson
Patrizio Lancellotti
Belgium

Task Force Members: Manuel J. Antunes (Portugal), Maria Grazia Bongiorni (Italy), Jean-Paul Casalta (France), Francesco Del Zotti (Italy), Raluca Dulgheru (Belgium), Gebrine El Khoury (Belgium), Paola Anna Erba (Italy), Bernard Iung (France), Jose M. Miro (Spain), Barbara J. Mulder (The Netherlands), Edyta Plonska-Gosciniak (Poland), Susanna Price (UK), Jolien Roos-Hesselink (The Netherlands), Ulrika Snygg-Martin (Sweden), Franck Thuny (France), Pilar Tornos Mas (Spain), Isidre Vilacosta (Spain), Jose Luis Zamorano (Spain).
IE: new guidelines ESC 2015

1. prevention
2. the “Endocarditis Team”
3. diagnosis
4. treatment
5. specific situations
1. prevention
2. the “Endocarditis Team”
3. diagnosis
4. treatment
5. specific situations
The multidisciplinary endocarditis team
Dramatic Reduction in Infective Endocarditis–Related Mortality With a Management-Based Approach

Elisabeth Botelho-Nevers, MD; Franck Thuny, MD; Jean Paul Casalta, MD; Hervé Richet, MD, PhD; Frédérique Gouriet, MD, PhD; Frédéric Collart, MD; Alberto Riberi, MD; Gilbert Habib, MD; Didier Raoult, MD, PhD

Arch Intern Med. 2009;169(14):1290-1298

The management of IE by a multidisciplinary medical-surgical team using a standardized protocol to treat IE was associated with a significant decrease in mortality
### Recommendations

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with complicated IE should be evaluated and managed at an early stage in a reference centre, with immediate surgical facilities and the presence of a multidisciplinary “Endocarditis Team”, including an ID specialist, a microbiologist, a cardiologist, imaging specialists, a cardiac surgeon, and if needed a specialist in CHD.</td>
<td>IIA</td>
<td>B</td>
</tr>
<tr>
<td>For patients with non-complicated IE managed in a non-reference centre, early and regular communication with the reference centre and, when needed, with visit to the reference centre, should be made.</td>
<td>IIA</td>
<td>B</td>
</tr>
</tbody>
</table>
IE: new guidelines ESC 2015

1. prevention
2. the “Endocarditis Team”
3. diagnosis
4. treatment
5. specific situations
The Duke echographic criteria


- vegetation
- abscess
- new dehiscence of prosthetic valve
Clinical suspicion of IE

- Prosthetic valve
- Intracardiac device
- Non-diagnosis TTE
- Positive TTE
- Negative TTE

TTE

TOE

Clinical suspicion of IE

If initial TOE is negative but high suspicion for IE remains, repeat TTE and/or TOE within 5-7 days

Stop

High

Low
$^{18}$FDG-PET-CT in endocarditis

First TEE  $^{18}$FDG-PET-CT  Follow-up TEE
PET/CT as a novel major criterion

- **Sensitivity**
  - Modified-Duke Criteria: 70%, p=0.008
  - PET/CT: 97%, p=0.5

- **Specificity**
  - Modified-Duke Criteria: 50%, 40%
Multimodality imaging in IE

TOE Morphology

PET CT Inflammation / infection

Cardiac CT Perivalvular lesions
## Major criteria

### 1. Blood cultures positive for IE

a. Typical microorganisms consistent with IE from 2 separate blood cultures:

b. Microorganisms consistent with IE from persistently positive blood cultures:

c. Single positive blood culture for *Coxiella burnetii* or phase I IgG antibody titre >1:800

### 2. Imaging positive for IE

a. Echocardiogram positive for IE:
   - Vegetation
   - Abscess, pseudoaneurysm, intracardiac fistula
   - Valvular perforation or aneurysm
   - New partial dehiscence of prosthetic valve

b. *Abnormal activity around the site of prosthetic valve implantation detected by* ¹⁸F-FDG PET/CT *(only if the prosthesis was implanted for >3 months)* or radiolabelled leukocytes SPECT/CT.

c. *Definite paravalvular lesions by cardiac CT.*
Clinical suspicion of IE

Modified Duke criteria (Li)

Definite IE
Possible/rejected IE but high suspicion
Rejected IE Low suspicion

Native valve
Prosthetic valve

1 - Repeat echo (TTE + TOE)/microbiology
2 - Imaging for embolic events
3 - Cardiac CT

1 - Repeat echo (TTE + TOE)/microbiology
2 - $^{18}$F-FDG PET/CT or Leucocytes labeled SPECT/CT
3 - Cardiac CT
4 - Imaging for embolic events

ESC 2015 modified diagnostic criteria

Definite IE Possible IE Rejected IE
IE: new guidelines ESC 2015

1. prevention
2. the “Endocarditis Team”
3. diagnosis
4. treatment
5. specific situations
ACC – AHA guidelines 2014 (valvular disease)

Nishimura RA - JACC – 2014 – 63: e57 - e185
## Indications and timing of surgery

<table>
<thead>
<tr>
<th>Indications for surgery</th>
<th>Timing</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Heart Failure</strong></td>
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<tr>
<td>Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula</td>
<td>Emergency</td>
<td>I</td>
<td>B</td>
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<tr>
<td>causing refractory pulmonary oedema or cardiogenic shock.</td>
<td></td>
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<tr>
<td>Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms</td>
<td>Urgent</td>
<td>I</td>
<td>B</td>
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<td>of HF or echocardiographic signs of poor haemodynamic tolerance.</td>
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<td><strong>2. Uncontrolled infection</strong></td>
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<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>
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<td>Persisting positive blood cultures despite appropriate antibiotic therapy and adequate</td>
<td>Urgent</td>
<td>IIa</td>
<td>B</td>
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<tr>
<td>control of septic metastatic foci.</td>
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<tr>
<td>PVE caused by staphylococci or non-HACEK Gram negative bacteria.</td>
<td>Urgent/elective</td>
<td>IIa</td>
<td>C</td>
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<tr>
<td><strong>3. Prevention of embolism</strong></td>
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<td></td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with persistent vegetations &gt;10 mm after one or more</td>
<td>Urgent</td>
<td>I</td>
<td>B</td>
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<tr>
<td>embolic episode despite appropriate antibiotic therapy.</td>
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<tr>
<td>Aortic or mitral NVE with vegetations &gt;10 mm, associated with severe valve stenosis or</td>
<td>Urgent</td>
<td>IIa</td>
<td>B</td>
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<tr>
<td>regurgitation, and low operative risk.</td>
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<tr>
<td>Aortic or mitral NVE or PVE with isolated very large vegetations (&gt;30 mm).</td>
<td>Urgent</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>Aortic or mitral NVE or PVE with isolated large vegetations (&gt;15 mm) and no other</td>
<td>Urgent</td>
<td>IIb</td>
<td>C</td>
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<td>indication for surgery.</td>
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</tbody>
</table>
Evolution under ATB therapy

October 14th, 2015

October 30th, 2015
Decision: transcatheter closure
Amplatzer deployment
Final result

Per procedure

TTE November 9, 2015
Take-home messages: PVE

1. Changing disease, but persistent high mortality
2. Multimodality imaging for diagnosis
3. New ESC diagnostic criteria and algorithm
4. Early surgery, if not contraindicated
5. Multidisciplinary “endocarditis team”