CASE CONFERENCE
Presenter: R1 李岱晃
Supervisor: F 蔡同堯
990206

Acute pulmonary edema

A microbial infection of the endocardial surface of the heart

<table>
<thead>
<tr>
<th>Risk Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor dental hygiene</td>
</tr>
<tr>
<td>Long-term hemodialysis</td>
</tr>
<tr>
<td>Diabetes mellitus.</td>
</tr>
<tr>
<td>HIV</td>
</tr>
<tr>
<td>Mitral-valve prolapse</td>
</tr>
<tr>
<td>Prosthetic-valve</td>
</tr>
<tr>
<td>Injection-drug use</td>
</tr>
</tbody>
</table>

Table 1: Radiographic Features That May Help to Differentiate Cardiogenic from Noncardiogenic Pulmonary Edema

<table>
<thead>
<tr>
<th>Radiographic Feature</th>
<th>Cardiogenic Pulmonary Edema</th>
<th>Noncardiogenic Pulmonary Edema</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart size</td>
<td>Normally enlarged</td>
<td>Normal or slightly enlarged</td>
</tr>
<tr>
<td>Width of the pulmonary vessels</td>
<td>Normal</td>
<td>Normally or less than normal</td>
</tr>
<tr>
<td>Vascular distribution</td>
<td>Balanced or inverted</td>
<td>Normal or balanced</td>
</tr>
<tr>
<td>Distribution of edema</td>
<td>Even or central</td>
<td>Paltry or peripheral</td>
</tr>
<tr>
<td>Microvascular changes</td>
<td>Present</td>
<td>Not usually present</td>
</tr>
<tr>
<td>Perivascular changes</td>
<td>Present</td>
<td>Not usually present</td>
</tr>
<tr>
<td>Septal changes</td>
<td>Not usually present</td>
<td>Usually present</td>
</tr>
</tbody>
</table>

Figure 3: Algorithm for the Clinical Differentiation Between Cardiogenic and Noncardiogenic Pulmonary Edema

N Engl J Med 2001;345:1820-8
CLINICAL MANIFESTATIONS

- Fever
- Anorexia, weight loss, malaise, and night sweats
- Heart murmur
- Petecia on the skin, conjunctivae, oral mucosa
- Splenomegaly

Splinter hemorrhages

Normally seen under the fingernails or toenails. Usually linear and red for the first two to three days and brownish thereafter.

Conjunctival petechiae

Tender, subcutaneous nodules, often in the pulp of the digits or the thenar eminence.

Osler’s nodes

Janeway’s lesions

Nontender erythematous, hemorrhagic, or pustular lesions, often on the palms or soles.
### DIAGNOSIS

- Clinical data
- Laboratory data
- Echocardiographic data
- Modified Duke Criteria

### MICROBIOLOGIC FEATURES

**HACEK** — Haemophilus aphrophilus; Actinobacillus actinomycetemcomitans; Cardiobacterium hominis; Eikenella corrodens; and Kingella kingae.
Echo
- Transthoracic echocardiography
- Transesophageal echocardiography
  - increases the sensitivity for detecting vegetations to 75 to 95% while maintaining specificity of 85 to 98%
  - Recommended as first-line diagnostic study to diagnose prosthetic valve endocarditis

Complication
- Cardiac:
  - CHF (Aortic-valve infection), AMI
  - AV block, bundle branch block
- Neurologic Complications
  - CNS: 65% in embolic event
  - Mycotic aneurysms
  - Systemic Emboli and Splenic Abscess
  - Prolonged Fever

Treatment
- Dependent on causative organism
- Empiric therapy: should cover staphylococci (MSSA and MRSA), streptococci and enterococci.

Treatment
- Duration of therapy
  - Fever subsides: 3 to 5 days
  - 4-6 weeks was recommended for streptococcal species and for staphylococci
- Combination antimicrobial therapy
  - With aminoglycoside

AHA Guideline - Class I
- Valve stenosis or regurgitation resulting in heart failure.
- AR or MR with hemodynamic evidence of elevated LV enddiastolic or left atrial pressures

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Dosage and Route</th>
<th>Duration</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>15-30 million U per 24 h IV divided doses</td>
<td>4</td>
<td>Reduced in sick patients greater than 65 yr or patients with impaired renal function</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>2 g per 24 h IV in 1 dose</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
AHA Guildline - Class I
- Infective endocarditis caused by *fungal or other highly resistant organisms.*
- Infective endocarditis complicated by *heart block, annular or aortic abscess, or destructive penetrating lesions.*

AHA Guildline - Class II
- IE present with *recurrent emboli and persistent vegetations* despite appropriate antibiotic therapy.

AHA Guildline - Class III
- IE present with *mobile vegetations in excess of 10 mm* with or without emboli.

Thank you for your attention!!

**题目：**

1. 一个发烧病人，过去无任何病史，做TTE发现mitral valve有vegetation且严重MR，推回急诊不久后开始喘，肺部有明显湿啰音，除治疗肺水腫外，应如何处理？
   - a) 使用Levofloxacin，并找感染科收住院。
   - b) 待病人呼吸平顺后，开立口服oxacillin，约心臟科门诊追踪。
   - c) 使用oxacillin + gentamicin，并找心臓外科来开刀。
   - d) 使用oxacillin + gentamicin，再找心臓科做TEE。

2. 下列哪位病人可以诊断为感染性心内膜炎？
   - a) 血液培養三套都長staphylococcus。
   - b) 心臓超音波(TTE)看到vegetation，病人发燒，有結膜下出血，肺部還看到似septic emboli。
   - c) 血液培養長staphylococcus，病人身上有不明針孔，且一直發燒。
   - d) 血液培养长staphylococcus，TTE发现mitral valve有abscess，病人最近发燒；手腳都有一点紅紅的，有的會痛有的不痛。

3. HACEK是感染性心内膜炎的致病菌，下列何者不在HACEK缩写之中？
   - a) H. parainfluenza
   - b) Actinobacillus
   - c) Cardiobacterium hominis
   - d) Eikenella corrodens
   - e) K.p

4. 怀疑感染性心内膜炎的病人，在什麼情况最好一開始就做TEE而不是先做TTE？
   - a) 病人有换过人工瓣膜
   - b) 病人已经发烧超过5天
   - c) 病人曾使用皮下注射，强烈怀疑感染性心内膜炎
   - d) 病人已经出现心臓衰竭的症状
5. 下列何者不是感染性心内膜炎的高危险群？
a) 常常吸大麻和强力胶，没事就嗑摇头丸的人
b) 得糖尿病太久导致長期洗腎的人
c) 因輸血感染HIV的人
d) 常常胸痛来急診，最後確診是MVP syndrome的人
e) 吃完東西都不刷牙，有嚴重口臭的人

AHA indication

Abstract

Objective: We investigated outcomes after surgery therapy in patients with active infective endocarditis (AE) with negative survival in terms of surgical strategy, mortality, and outcomes in a single-surgeon center. A total of 255 patients received surgical treatment between January 2008 and March 2017. Patients were classified into two groups: those who received surgical treatment (87%) and those who received medical treatment (13%). The outcomes were compared between the two groups using the chi-square test and the Student t-test. The overall survival rate for patients who received surgical treatment was significantly higher than that for patients who received medical treatment. The mortality rate for patients who received surgical treatment was also significantly lower than that for patients who received medical treatment. The results are consistent with previous studies and suggest that surgical therapy is superior to medical therapy for patients with active infective endocarditis.

AHA indication

Table 23: Definition of Relative Endocarditis, According to the Proposed Modified Duke Criteria* (continued)

* endocarditis: endocardium disease involving two or more valves or two or more valve leaflets, with or without vegetation
* Duke criteria: endocarditis: endocardium disease involving two or more valves or two or more valve leaflets, with or without vegetation
* modified Duke criteria: endocarditis: endocardium disease involving two or more valves or two or more valve leaflets
* AHA: American Heart Association
* Duke: Duke University
* Modified Duke: Modified Duke University
* criteria: endocarditis: endocardium disease involving two or more valves or two or more valve leaflets
* modified Duke criteria: endocarditis: endocardium disease involving two or more valves or two or more valve leaflets
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### Surgery Indication

Table 1. Indications for surgery in patients with infective endocarditis

<table>
<thead>
<tr>
<th>Indication</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute AF with severe degree of mitral valve</td>
<td>A</td>
</tr>
<tr>
<td>Paravalvular abscess with evidence of rupture into a right heart chamber</td>
<td>A</td>
</tr>
<tr>
<td>Urgent indication for cardiac surgery within 1–3 days</td>
<td>A</td>
</tr>
<tr>
<td>Echocardiographic evidence of acute, severe, or multivalvular regurgitation</td>
<td>A</td>
</tr>
<tr>
<td>Refractory endocarditis despite adequate antibiotic treatment, &gt;7 days</td>
<td>B</td>
</tr>
<tr>
<td>Pseudomembranous or vegetations &gt;1 cm, rapid growth of vegetations, &gt;7 days</td>
<td>C</td>
</tr>
</tbody>
</table>

Indications and optimal timing for surgery in infective endocarditis. Heart 2004 90: 618-620