Management of Pericarditis
Acute, Chronic and Recurrent

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History of Pericardial Diseases

131-201 Galen: 1st description of pericardial effusion

11th century: Ibn Zuhr: Hydropericardium in "Al Taisir"
1774 Jean Baptiste Genoc: Traite de la structure du Coeur
1828 Jean Cruveilhier

Pericardial pathology 900 years ago

Ibn Zuhr on Diseases of the Heart. The section on diseases of the heart in Al-Taisir book of Ibn Zuhr is situated next to diseases of the lung and immediately before diseases of the liver. The section starts with the following introductory statement translated from page 179 (Vol. 1): "Diseases of the heart may occur primarily or may be secondary to the other organs. Also, diseases of the heart may cause other organs to suffer from deleterious effects, ailments and symptoms."

On the fluid collection that may occur in the covering of the heart: In the heart, a watery fluid collection looking like urine, may occur. It is found enclosed and contained within its covering. When this happens, the patient will lose flesh until he dies in the same way as the rest of cachectic (patients') die.
Pericarditis

- Acute Pericarditis
- Pericardial tamponade
- Recurrent Pericarditis
- Chronic Pericarditis

Acute Pericarditis
Treatment Strategies

- Medical
- Interventional
  - Pericardiocentesis
  - Intra-pericardial treatment
  - Percutaneous Balloon Pericardiectomy
- Surgical
  - Sub-xiphoid pericardial window
  - Pricardiection
Pericarditis – Overlooked Clinical Symptoms and Manifestations

- Palpitations (Sinustachycardia/SVT/TAA..)
- Dyspnoea
- Physical weakness
- Hypotension
- Venous congestion
- Pulsus paradoxus in tamponade = Decrease of pulse amplitude (or blood pressure) during inspiration

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The mistake of a beginner - The EKG-misdiagnosis: Infarction

H.K. *. 27.4.1941, male  EKG at admission
A. "DRY" ACUTE PERICARDITIS
B. ACUTE PERICARDITIS WITH PERICARDIAL EFFUSION
Symptomatic management

- Exercise restriction
- Hospitalisation to determine the aetiology and observe for tamponade and the effect of treatment.
- Pain management

Guidelines on the Diagnosis and Management of Pericardial Diseases

ACUTE PERICARDITIS
Pain management

- NSAIDs are the mainstay (level of evidence B, class I).
- Ibuprofen is preferred (rare side-effects, favourable impact on the coronary flow, and the large dose range: 300-800 mg every 6-8 h)
- Aspirin 300-600 mg every 4-6 h
- Indomethacin should be avoided in elderly pts (flow reduction in the coronaries).
- Gastrointestinal protection must be provided.
Colchicine in acute pericarditis
COPE RANDOMIZED TRIAL: COLchicine for acute PERicarditis

- 120 pts, 1st episode of acute pericarditis
- Randomly assigned to aspirin 800 mg tid or qid, 7 to 10 days with gradual tapering over
- 3 to 4 weeks (group I) or aspirin plus colchicine 0.5 to 1.0 mg/d for the first day and then 0.5 to 1.0 mg/d for 3 months (group II).
- Corticosteroid therapy was restricted to patients with aspirin contraindications or intolerance.
- The primary end point was recurrence rate.

(Imazio et al. Circulation 2005)

### Table

<table>
<thead>
<tr>
<th>Feature</th>
<th>Group I: No Colchicine (n=60)</th>
<th>Group II: Colchicine (n=60)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean follow-up, mo</td>
<td>23.7±8.8</td>
<td>24.2±6.7</td>
<td>NS</td>
</tr>
<tr>
<td>Corticosteroid use,* n (%)</td>
<td>10 (16.6)</td>
<td>9 (15.9)</td>
<td>NS</td>
</tr>
<tr>
<td>Recurrence, n (%)</td>
<td>20 (33.3)</td>
<td>7 (11.7)</td>
<td>0.009</td>
</tr>
<tr>
<td>Recurrence rate at 18 mo, %</td>
<td>32.3</td>
<td>10.7</td>
<td>0.004</td>
</tr>
<tr>
<td>Symptoms persistence at 72 h, n (%)</td>
<td>22 (36.7)</td>
<td>7 (11.7)</td>
<td>0.003</td>
</tr>
<tr>
<td>Side effects, n (%)</td>
<td>4 (6.7)</td>
<td>5 (8.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Severe adverse effects, n (%)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>NS</td>
</tr>
<tr>
<td>Cardiac tamponade, n (%)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>NS</td>
</tr>
<tr>
<td>Constrictive pericarditis, n (%)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>NS</td>
</tr>
</tbody>
</table>

*Steroid prescribed for the index attack because of aspirin contraindications or intolerance.
1P value from log-rank test.

### Diagram

ACUTE PERICARDITIS

- TAMponade or PE >20 mm in diastole
- NO TAMponade PE 10-20 mm in diastole
- NO TAMponade PE <10 mm in diastole

- PericardioCENTESIS PERICARDIAL DRAINAGE (best with cardiac catheterization)
- PericardioSCOPY AND PERICARDIAL PERICARDIAL BIOPSY
- IntraPERICARDIAL THERAPY
- FOLLOW-UP ECHOCARDIOGRAPHY

Symptomatic management
- Hospitalization and exercise restriction
- Pain management
  - Aspirin, 300-800 mg tid or qid
  - Colchicine, 0.5 mg bid

The Task Force on the Diagnosis and Management of Pericardial Diseases
Tamponade
Clinical features

- Elevated Central Venous Pressure
- Hypotension
- Pulsus Paradoxus “absent in presence of ASD or AI”
- Tachycardia “might be absent in Uremia and Myxedema
- Dyspnea and tachypnea with clear lungs

The mistake of a beginner- EKG-misdiagnosis: 2 – an overlooked detail!
The Physiology and Pathophysiology of the Pericardium

CLINICAL FORMS OF TAMponade

- Overt clinical tamponade (high pressure)
- Low pressure tamponade
- Regional tamponade
- Tension pneumopericardium

Sometimes the radiologist is faster!
Diagnosis of pericardial effusion - Chest x-ray:
The water bottle heart
Pericardial emergencies
IMPROVEMENT IN TREATMENT EFFICACY

INTERVENTIONAL TREATMENT

- Pericardiocentesis
- Percutaneous balloon pericardiotomy

Pericardial Access and Drainage
STATE OF THE ART APPROACHES

Pericardiocentesis
- Subxiphoid (medial)
- Intercostal (lateral)

Surgical drainage
- Subxiphoid pericardiotomy
- Medial sternotomy and pericardectomy
**Pericardiocentesis**

**GUIDANCE**

**THE MOST IMPORTANT CLINICAL ISSUE**

- No guidance (not justified any more)
- Echocardiography
- Fluoroscopy

Proper guidance mandatory to:
- Prevent mortality
- Reduce complications
- Increase operative accuracy and comfort

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**Guidelines on the Disgnosis and Management of Pericardial Diseases**

**PURULENT PERICARDITIS**

Management

- Urgent pericardial drainage
- **Intravenous antibiotic therapy** (e.g. vancomycin 1 g bid, ceftriaxone 1-2 g bid, and ciprofloxacin 400 mg/day (MIC and MBC need to be considered).
- Irrigation with urokinase, streptokinase or TPA, using large catheters, may liquefy the purulent exudate
- Open surgical drainage is preferable.

Maier, Seferovic, Ristic et al. ESC guidelines on pericardial diseases. Eur Heart J 2004
Percutaneous Balloon Pericardiotomy

Percutaneous Balloon Pericardiotomy
Percutaneous Balloon Pericardiotomy

Percutaneous Balloon Pericardiotomy
TRAUMATIC PERICARDIAL EFFUSION MANAGEMENT

- URGENT ECHOCARDIOGRAPHY (TEE, if available)
- RESCUE PERICARDIOCENTESIS
- AUTOTRANSFUSION
- URGENT THORACOTOMY AND SURGICAL REPAIR

HAEMOPERICARDIUM IN AORTIC DISSECTION
Diagnosis

- Echocardiography (both TTE and TEE)
- CT or MRI in complex cases
- Angiography (only in stable patients)

Maierhofer, Seferović, Ristić et al. ESC guidelines on pericardial diseases. Eur Hear J 2008
Recurrent Pericarditis

- High dose steroids is recommended (1-1.5 mg /kg)
- Very gradual tapering over months
- Start tapering after symptom relief and normalization of the CRP
- If recurrence occurs during tapering never increase the steroid dose again but control symptoms using NSAID
Event-free survival of patients

Adverse events included severe side effects, recurrences, cardiac tamponade, and constrictive pericarditis.

Tapering regimen of prednisone in recurrent pericarditis

<table>
<thead>
<tr>
<th>Prednisone daily dose</th>
<th>Tapering</th>
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<tbody>
<tr>
<td>&gt;50 mg</td>
<td>10 mg/day every 1 to 2 weeks</td>
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<tr>
<td>50-25 mg</td>
<td>5-10 mg/day every 1 to 2 weeks</td>
</tr>
<tr>
<td>25-15 mg</td>
<td>2.5 mg/day every 2 to 4 weeks</td>
</tr>
<tr>
<td>&lt;15 mg</td>
<td>1.25 to 2.5 mg/day every 2 to 6 weeks</td>
</tr>
</tbody>
</table>

Every decrease of prednisone dose should be only done if the patient is asymptomatic and C-reactive protein is normal, particularly for doses lower than 25 mg/day.
CARDIAC DECOMPESSION IN CHRONIC ADVANCED CONSTRICTION

- Constrictive pericarditis is present when a fibrotic, thickened, and adherent pericardium restricts diastolic filling of the heart.
- Initial episode of acute pericarditis
- Subacute stage of organization and resorption of the effusion
- Chronic stage consisting of fibrous scarring and thickening of the pericardium with obliteration of the pericardial space.

CLINICAL SUSPICION FOR:

CHRONIC PERICARDIAL EFFUSION

CONSTRUCTIVE PERICARDITIS

EFFUSIVE-CONSTRICTIVE PERICARDITIS

RECURRENT PERICARDITIS

ECHOCARDIOGRAPHY

CARDIAC CATHETERIZATION

Congestive heart failure therapy

Symptomatic management
Hospitalization and exercise restriction
Path management
- Ibuprofen, 900-1800 mg tid or qid
- Coenzyme Q10, 100 mg bid
- Prednisone 1-1.5 mg qd

PERCUTANEOUS BALLOON PERICARDIODICTION

PERICARDIOTOMY

Maisch, Seferovic, Riatic et al. ESC guidelines on pericardial diseases, Eur Heart J 2004
Thank you