Primary and secondary purulent pericarditis in otherwise healthy adults

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Abstract

The records of five previously healthy adult patients with primary and secondary purulent pericarditis are reported, in order to review the literature about such a rare condition and to discuss the options for treatment. Primary purulent pericarditis occurred in a five months pregnant woman and in a lady who had experienced a serous pericarditis two months before. A man presented with pyo-pneumopericardium. He had an episode of acute prostatitis 30 days before. Two further patients had purulent pericarditis secondary to pulmonary and mediastinal infections. The diagnosis was made late in all cases, after tamponade and shock occurred. Pre-operative catheter drainage failed to prevent recurrent tamponade and sepsis in two patients. All patients underwent thoracotomy and partial pericardiectomy. A downward transdiaphragmatic spreading collection was evident in one patient and laparotomy was needed. The mean postoperative stay was 30.4 days (20–48 days). All patients were discharged home in good health. The lady who was pregnant experienced an uncomplicated vaginal delivery. The follow-up time ranged between 5 months to 12 years. No patient has signs of pericardial constriction. We conclude that effective control of sepsis and prevention of possible further constriction are achieved safely by open surgical drainage and partial pericardiectomy.

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Keywords: Purulent pericarditis; Subxiphoid pericardial drainage; Pericardiectomy; Intrapericardial thrombolysis

1. Introduction

Purulent pericarditis usually arises in children and/or in the context of an underlying disease, predisposing to immunosuppression and infection [1]. It is more frequently reported in association with endothoracic infections [2]. A few primary cases have been occasionally reported. The prevalence of such a condition has been reported to be as low as 0.8% among patients with acute primary pericardial diseases [3]. The haematogenous dissemination is rare and it usually develops from an evident site of infection [4]. Mortality is still high, mainly due to late diagnosis and to early occurrence of potentially fatal complications [4,5].

The observation of five rare cases of both primary and secondary purulent pericarditis in otherwise healthy adult patients has been the occasion to review the literature and to discuss the ideal strategy for treatment.

2. Patients and methods

Five adult patients with purulent pericarditis were referred to our Unit between 1991 and 2005. The records were reviewed. The follow-up was made by means of outpatient examinations and phone calls.

3. Results

3.1. Patients’ history and presentation

There were four women and one man with a mean age of 39.8 years (21–70 years) (Table 1). Shortness of breath, hypoxia and tachycardia occurred fifteen days after that a left cervical phlegmon partially recovered with medical therapy (Patient 1). Anterior chest discomfort and moderate dyspnoea occurred during the fifth month of an otherwise uncomplicated pregnancy. During the subsequent 48 h the conditions became critical (Patient 2). A pneumococcal right lower lobe pneumonia with homolateral pleural effusion was diagnosed 26 days before. Progressively worsening dyspnoea and hyperpyrexia occurred in spite of optimal medical therapy (Patient 3). One patient experienced progressively worsening dyspnoea and fever for seven days. An episode of acute prostatitis had occurred 30 days before (Patient 4). An idiopathic serous pericarditis with small pericardial and pleural effusions had been diagnosed two months before. The patient was discharged home after medical treatment. No invasive manoeuvre was performed. Worsening dyspnoea occurred during the last 10 days (Patient 5) (Fig. 1).

3.2. Treatment and surgical findings

Details are reported in Table 1. In all patients the pericardium was widely opened. It was then debrided and

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excised as much as possible. The dimension of pericardectomy in each case was not registered.

3.3. Bacteriology

Isolated germs were: β-hemolytic Streptococcus and Bacteroides fragilis (Case 1, pericardial fluid, mediastinal material), Streptococcus (Cases 2 and 4, pericardial fluid), Streptococcus pneumoniae (Case 3, sputum) and Pseudomonas aeruginosa (Case 5, pleural fluid).

3.4. Postoperative course, outcome and follow-up

Postoperative ventilation was needed in patients 1, 3 and 4 for 2, 9 and 1 days, respectively. Complications (low output syndrome, renal failure, bleeding duodenal ulcer) occurred in patients 3 and 4. The mean postoperative stay was 30.4 days (20–48 days). The lady who was pregnant experienced an uncomplicated vaginal delivery. Further details are reported in Table 1.

4. Discussion

Purulent pericarditis is observed rarely in previously healthy adult individuals. Single cases and a few small

Table 1

<table>
<thead>
<tr>
<th>Case no. age/sex</th>
<th>Chest X-ray</th>
<th>ECG</th>
<th>Echocardiography</th>
<th>Chest CT</th>
<th>Pre-op. pericardial/pleural drainage</th>
<th>Surgical treatment</th>
<th>Surgical findings</th>
<th>Outcome, hospital stay, follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1 21/F</td>
<td>Mediastinal widening Right pleural effusion</td>
<td>Aspecific</td>
<td>–</td>
<td>Mediastinal collections Right bronchopneumonic foci Right pleural effusion Circumferential pericardial effusion</td>
<td>No</td>
<td>RT PL DEBR MD PP TD</td>
<td>Pl. empyema Med. collections Thick pericardium Peric. empyema Abscess II inf. left. molar</td>
<td>Discharged 20 days</td>
</tr>
<tr>
<td>Case 2 24/F</td>
<td>Wide cardiac shadow Left pleural effusion</td>
<td>Aspecific</td>
<td>Large pericardial effusion Early tamponade</td>
<td>–</td>
<td>Yes</td>
<td>PCD LT P DEBR PP</td>
<td>Thick pericardium Peric. empyema Peric. loculations</td>
<td>Discharged 24 days</td>
</tr>
<tr>
<td>Case 3 38/F</td>
<td>Wide cardiac shadow Right pleural effusion</td>
<td>Aspecific</td>
<td>–</td>
<td>Right pleural effusion Lung entrapment Circumferentially thickened pericardium</td>
<td>No</td>
<td>RT DEC P DEBR PP</td>
<td>Pl. empyema Thick pericardium Peric. loculations</td>
<td>Discharged 48 days</td>
</tr>
<tr>
<td>Case 4 59/M</td>
<td>Wide cardiac shadow Left pleural effusion</td>
<td>Diffuse ST segment elevation Decreased QRS voltage</td>
<td>Circumph. pericardial effusion Thick pericardium</td>
<td>Large pericardial effusion Pneumopericardium Left pleural effusion</td>
<td>Yes</td>
<td>LT PCD P DEBR PP LAP UPD</td>
<td>Thick pericardium Peric. empyema Peric. loculations Peritoneal collection</td>
<td>Discharged 37 days</td>
</tr>
<tr>
<td>Case 5 70/F</td>
<td>Massive left pl. effusion Mediastinal displacement</td>
<td>Aspecific</td>
<td>No pericardial effusion Normal cardiac function</td>
<td>Massive left pleural effusion Loculated pericardial collections</td>
<td>Yes</td>
<td>LT DEC P DEBR PP</td>
<td>Pl. empyema Thick pericardium Peric. empyema Peric. loculations</td>
<td>Discharged 23 days</td>
</tr>
</tbody>
</table>

Abbreviations: PCD: pericardial catheter drainage; TT: tube thoracostomy; RT: right thoracotomy; PL DEBR: pleural debriment; MD: mediastinal drainage; PP: partial pericardectomy; TD: tooth drawing; LT: left thoracotomy; P DEBR: pericardial debriment; DEC: decortication; LAP: laparotomy; UPD: upper peritoneal drainage.
cases of secondary pericarditis were observed. We speculate that a superinfection of a small pericardial effusion occurred in patient 2. Nevertheless, the mechanism by which the pericardial sack became infected remains unexplained. The typical findings of idiopathic serous pericarditis were evident in patient 5. How such a condition gave rise to the severe acute picture we observed is not clear. As regards patient 4, the episode of acute prostatisitis may have been the causative moment of the subsequent pyopneumopericardium, even if a clear correlation is not evident. Two cases of frankly secondary pericarditis were observed (Patients 1 and 3). An atypical case of descending mediastinitis occurred in patient 1. This is the only case in which a pericardial involvement was observed in our experience [8].

Early occurrence of fluid organization and frank constrictive pericarditis is a known sequela of purulent pericarditis [4,5]. Nonetheless, its onset can be insidious as well, developing months or even years after an initial episode of pericarditis [9]. There is disagreement about the safest and most effective technique of pericardial drainage and whether pericardiectomy should be performed in order to prevent late constriction [1,3–6,10].

The successful use of pericardiocentesis and/or subxiphoid tube drainage, followed by the intrapericardial instillation of thrombolytic agents, has been recently reported [1,6,7]. Nonetheless, a protocol is not available and the treatment must be individualized paying attention to possible severe complications [1,3,10]. Moreover, long-term results are pending and the risk could exist of late constrictive pericarditis.

The immediate surgical approach was mandatory in both cases of secondary pericarditis (Cases 1 and 3), due to cardiocirculatory impairment, aggressive sepsis and lung entrapment. Open surgery was deemed mandatory also in case 5, where the lung was entrapped by a very dense material and the pericardium frankly loculated with very thick walls. A subxiphoid tube drainage could have been considered in the remaining two cases (Patients 2 and 4). Open surgical treatment was performed due to cardiac tamponade and rapid thick fluid re-accumulation with catheter blockage (Patient 2) and to uncontrolled sepsis (Patient 4).

One could be concerned about possible cardiac herniation after partial pericardiectomy. We deemed it unlikely to occur due to the presence of the lung and of a few residual pericardial adhesions which tended to keep the heart in its position.

Even if small, this series is noteworthy, in our opinion, because it reports on five rare cases of purulent pericarditis with different and atypical presentations in otherwise healthy adults. It is worth stressing a few points: 1) variable degrees of pericardial thickening and loculations tend to occur early. Furthermore, the infection can spread downward to the diaphragm and the peritoneum; 2) subxiphoid catheters associated with intrapericardial fibrinolysis can be successfully used in case of isolated pericardial empyema. Nevertheless, a treatment protocol is lacking and long-term results are pending; 3) effective control of sepsis and prevention of possible further constriction are achieved safely by open surgical drainage and partial pericardiectomy, particularly when tamponade or early re-accumulation of thick pus occurs and sepsis persists after pericardial drainage.

References