Short Communication

An Unusual Case of Fatal Pericarditis due to Listeria monocytogenes

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SUMMARY: Pericarditis due to Listeria monocytogenes is a very uncommon and serious disease. We describe a case of fatal subacute pericarditis that was caused by L. monocytogenes in a 61-year-old woman with Hodgkin’s disease who was diagnosed in 1975 and considered cured. In addition, we review the literature on this condition.

In Occidental countries, most cases (80–85%) of acute pericarditis are idiopathic. This diagnosis, which is based on non-invasive techniques, is generally presumed to be viral. The 15–20% of non-idiopathic cases includes tuberculosis, neoplasia, and autoimmune pericarditis. Bacterial purulent pericarditis rarely occurs (incidence, <10%) (1–3), and recent publications have shown a significant decrease in its incidence to around 1% (4). The most frequently isolated bacteria reported in older publications are Staphylococcus aureus (22%) (1,5), Streptococcus pneumoniae (9–22%) (1,5), Haemophilus influenzae, and Neisseria meningitidis (3%) (5). The outcome of bacterial purulent pericarditis is life-threatening with 40% mortality (6). We describe here a rare and unexpected discovery of Listeria monocytogenes pericarditis, and we review the literature on the subject, showing a rate of mortality up to 62% in case of L. monocytogenes pericarditis.

A 61-year-old woman was admitted to the cardiovascular surgery unit of the University Hospital Centre of Lille (France) for dyspnea and leg edema, which was related to pleural effusion. This patient was hospitalized in a Parisian hospital for constrictive pericarditis 12 years previously. A hemodynamic investigation showed anterior predominant constriction and biventricular muscular restriction, which was probably due to the radio-therapy treatment for Hodgkin’s disease that was conducted in 1975. At that time, a pericardiectomy was denied. From July 2010 to February 2011, this patient presented with three episodes of respiratory deterioration, consisting of shortness of breath, leg edema, and bilateral pleural effusion. Each time, the pleural liquid was evacuated, and treatment with a diuretic was conducted. The pleural fluid was slightly cloudy, and the cytological analysis evocated an exudate, but no bacteriological analysis was performed. Heart magnetic resonance imaging confirmed chronic pericarditis with upper and lower vena cava enlargement and interventricular and interauricular septa kinetic troubles. There were no abnormalities of cardiac early or late enhancement. The ventricular ejection fraction was 44%. There was no enlargement or stricture of the cardiac cavities. At the end of May (day 1), she was admitted to our hospital in order to treat an increase of dyspnea and leg edema. Hemodynamic parameters were normal. Clinical signs favored bilateral pleural effusion. Her heart rate was 100 beats/min, and an electrocardiogram showed a sinus rhythm. She was apyretic but presented a leukocyte count of 24.6 × 10⁹ cells/L with 92% polymorphonuclear cells and C-reactive protein (CRP) level of 249 mg/L (normal level, ≤6 mg/L). Arterial blood gas parameters were as follows: pH = 7.57, pCO₂ = 44 mmHg, and pO₂ = 50 mmHg. Arterial oxygen saturation was 90% in a rest period and in ambient air. The dyspnea and edema quickly decreased after high doses of intravenous diuretics. Because of the rapid deterioration of the clinical situation, the patient finally agreed to surgical pericardiectomy.

A direct smear examination of the pericardium liquid showed many leucocytes (polymorphonuclear cells) without bacteria and yielded a short Gram-positive rod in pure culture. This non-motile, non-sporing forming, β-hemolytic, and facultative aerobic rod was catalase-positive and hydrolyzed esculin in less than 2 h. Matrix-assisted laser desorption and ionization (MALDI) time-of-flight mass spectrometry identification using a thin smear of this strain on a MALDI-plate was performed. Measurements were performed with a Microflex mass spectrometer (Bruker Daltonik S.A., Wissembourg, France) using FlexControl software (version 3.0). The spectrum was imported into the BioTyper software (version 2.0; Bruker Daltonik GmbH, Bremen, Germany). The Biotyper database contains the spectra of approximately 3,847 species and is regularly updated by the Bruker Company. The results of the pattern-matching process were expressed with a score of 2.3, giving L. monocytogenes as the first choice (a score > 2.0 was considered as identification at the species level). In vitro antimicrobial susceptibility tests of this strain were obtained by the disk diffusion method on Mueller-Hinton agar plates, as recommended by the Comité de l’Antibiogramme de la Société Française de Microbiologie (CA-SFM) criteria (Comité de l’Antibiogramme de la Société Française de Microbiologie;

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http://www.sfm.asso.fr). The strain was susceptible to penicillin G, ampicillin, piperacillin, imipenem, aminoglycosides, glycopeptides, erythromycin, pristinamycin, doxycycline, tigecycline, trimethoprim-sulfamethoxazole, and levofloxacin and resistant to cefotaxime, ofloxacin, and clindamycin. Blood cultures remained sterile because the bacteriologic phase was resolved when the first blood culture was performed. Intravenous antibiotic therapy with amoxicillin and trimethoprim-sulfamethoxazole was initiated. Anamnesis of the patient did not reveal the consumption of a particular food nor underlying immunocompromised diseases or chronic liver and kidney diseases. In the critical care unit, post-surgical time was complicated by hemodynamic instability requiring prolonged use of vasopressive amines and pacemaker implantation. Respiratory weaning difficulties persisted and were complicated by nosocomial pneumonia due to extended-spectrum β-lactamase (ESBL) *Escherichia coli*, which was treated by imipenem and amikacin (day 10). ESBL *E. coli* bacteremia occurred (day 15), and the patient finally died of fungemia due to *Candida albicans* that was not associated with a catheter at the end of June (day 25). No investigations were performed to rule out lymphoma because the patient died. The family did not grant permission for an autopsy.

In France, 312 cases of listeriosis were declared in 2010. The main infections are bacteremia, meningoencephalitis, and neonatal infections with 168, 78, and 43 cases, respectively, in 2010 (7). The lethality of these infections was 20–30%, showing the seriousness of this infection. In this patient, the outcome of the illness was fatal in 5/8 cases, showing the seriousness of this infection. In our case, there was no neurological failure or cardiac murmur found during clinical examination, but further investigations of these localizations (cerebral magnetic resonance imaging or transesophageal ultrasound scan) were impossible because of the critical situation of the patient. In addition, cerebrospinal fluid was not taken. Anamnesis did not reveal any particular exposure, and the patient had not presented with any digestive symptoms. We suggest that this community pericarditis was due to the bacterial graft that was done in May 2010 when the clinical situation began to get worse along with the increase in the CRP levels. In this patient, the Hodgkin’s disease that was diagnosed in 1975 was considered cured. The only factor found in this patient to explain the bacterial graft without general immunocompromised features was the local state of the pericardium. Moreover, recently, Alonzo et al. (12) showed that a subpopulation of *L. monocytogenes* might have an enhanced invasion of cardiac cells. All the other cases de-

### Table 1. Cases of *L. monocytogenes* pericarditis in the literature

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sex</th>
<th>Age</th>
<th>Underlying disease at the time of diagnosis</th>
<th>Type of infection</th>
<th>Clinical presentation</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khan et al. (13)</td>
<td>M</td>
<td>61</td>
<td>Cirrhosis</td>
<td>Pericarditis</td>
<td>Fever, chills</td>
<td>Penicillin</td>
<td>Alive</td>
</tr>
<tr>
<td>Tice et al. (14)</td>
<td>M</td>
<td>52</td>
<td>Cirrhosis</td>
<td>Bacteremia</td>
<td>Subternal pain</td>
<td>Diuretics</td>
<td>Dead</td>
</tr>
<tr>
<td>Holoshitz et al. (15)</td>
<td>F</td>
<td>54</td>
<td>Hemodialysis</td>
<td>Pericarditis</td>
<td>Pericarditis</td>
<td>Diuretics</td>
<td>Dead</td>
</tr>
<tr>
<td>Crellin et al. (16)</td>
<td>F</td>
<td>58</td>
<td>Cervix carcinoma + cortisteroides</td>
<td>Bacteremia</td>
<td>Fever</td>
<td>Cefazolin</td>
<td>Alive</td>
</tr>
<tr>
<td>Ferguson et al. (17)</td>
<td>M</td>
<td>37</td>
<td>HIV</td>
<td>Pericarditis</td>
<td>Pericarditis</td>
<td>Erythromycin</td>
<td>Dead</td>
</tr>
<tr>
<td>Revathi et al. (18)</td>
<td>F</td>
<td>25</td>
<td>Post-partum</td>
<td>Bacteremia</td>
<td>Fever</td>
<td>Resuscitation measures</td>
<td>Dead</td>
</tr>
<tr>
<td>Manso et al. (19)</td>
<td>M</td>
<td>65</td>
<td>Hemochromatosis</td>
<td>Pericarditis</td>
<td>Confusion</td>
<td>Ampicillin</td>
<td>Dead</td>
</tr>
<tr>
<td>Dias et al. (20)</td>
<td>M</td>
<td>60</td>
<td>Cirrhosis (Chidl-Pugh B)</td>
<td>Pericarditis</td>
<td>Astenhia</td>
<td>Surgical</td>
<td>Alive</td>
</tr>
<tr>
<td>Present case</td>
<td>F</td>
<td>61</td>
<td>None</td>
<td>Pericarditis</td>
<td>Dyspnea</td>
<td>Amoxicillin</td>
<td>Dead</td>
</tr>
</tbody>
</table>

scribed in the literature showed a general immunocompromised factor for *L. monocytogenes* pericarditis.

In conclusion, *L. monocytogenes* is a rare cause of pericarditis that needs to be diagnosed and treated early in order to avoid a high rate of mortality, especially because this infection may occur in immunocompromised patients.

**Conflict of interest** None to declare.

**REFERENCES**


