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CASE REPORT

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Purulent pericarditis with *Salmonella enteritidis* in a patient with CD4/CD8 depression

Yosuke Takamiya (MD)^{a,*}, Kazuyuki Shirai (MD)^a,
Masahiro Fujino (MD)^a, Nathan Miller^a, Yoshihiro Tsuchiya (MD)^a,
Masanori Okabe (MD)^b, Keiji Saku (MD)^a

^a Department of Cardiology, Fukuoka University School of Medicine,
7-45-1 Nanakuma Jonan-ku, Fukuoka 814-0180, Japan

^b Saiseikai Fukuoka General Hospital, Fukuoka, Japan

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KEYWORDS

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Summary A 65-year-old man was admitted for high-grade fever with a shaking chill and general fatigue. Chest X-ray showed cardiomegaly, and echocardiography revealed a large amount of pericardial effusion. Emergency pericardiocentesis was performed, and *Salmonella enteritidis* was found in pericardial fluids. We diagnosed purulent pericarditis with *S. enteritidis*, and administered antibiotics. While high-grade fever resolved 10 days after beginning of treatment, effusive-constrictive pericarditis (ECP) without definite symptoms persisted for 2 months.

Because of the improvement of his hemodynamic states on cardiac catheterization after 1 year, an operative procedure was not required. He was diagnosed as having CD4/CD8 depression without apparent diseases. There are few reports of pericarditis with *S. enteritidis*, and we believe this case might be only the second recorded case of ECP with *S. enteritidis*.

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Introduction

More than 200 serovars of salmonella are pathogenic in humans. *Salmonella enteritidis* is the most common pathogen after *Salmonella*

typhi, and usually causes gastroenteritis. Up to 5% of patients have demonstrated the pathogen in their blood. Five to 10% of people carrying these bacteria have been associated with cardiovascular complications, including endocarditis or bacterial aortic aneurysm, etc. [1]. We report here a case of effusive-constrictive pericarditis (ECP) following purulent pericarditis caused by *S. enteritidis*, which has rarely been reported. ECP is an uncommon pericardial syndrome characterized by intense

* Corresponding author. Tel.: +81 92 801 1011;
fax: +81 92 865 2592.

E-mail address: ytakamiya2007@yahoo.co.jp (Y. Takamiya).

pericardial effusion, concomitant tamponade, and constriction caused by the visceral pericardium [2].

Case report

A 65-year-old male with stable angina pectoris was admitted to our hospital complaining of high-grade fever with a shaking chill and general fatigue. Stable angina pectoris had been treated with aspirin, diltiazem and nitroglycerin for 5 years. His body temperature was 39.0 °C and his blood pressure was 164/84 mmHg. Heart rate was 98/min and regular, and paradoxical pulse was not apparent. His heart sound showed neither murmur nor pericardial friction rub. No peripheral edema and hepatomegaly were observed. In laboratory examinations, the white blood cell count was 11800/mm³ with 85% neutrophils, and C-reactive protein was 35.8 mg/dl. Chest X-ray revealed cardiomegaly (CTR 62%) and bilateral pleural effusions. Electrocardiogram (ECG) showed concave upward ST-segment elevation in I, II, III and aVF. Twenty-four days later, ECG demonstrated negative T wave in I, II, III, aVF, aVL and V2-6. A two-dimensional view of the echocardiogram revealed a large amount of pericardial effusion around the heart, and neither right atrium nor ventricular apparently collapsed. Emergency pericardiocentesis was performed, and 630 ml of fluid was drained. Pericardial effusion contained high white cell counts and the total protein value

was 5.7 g/dl. *S. enteritidis* was detected by a culture study of the fluids. No malignant cells were detected. The pleural effusion also showed the same exudative pattern, but *S. enteritidis* was not seen. The results of the concomitant blood and stool cultures were negative for Salmonella. No primary source of salmonella could be confirmed. While, he was diagnosed as CD4/CD8 depression ($0.81 < 1.0$) which suggested immunodeficiency, but he did not have a malignant disease, HIV infection or blood disease.

The clinical course of the patient is shown in Fig. 1. He was treated with cefotiam and fosfomycin for 10 days, ampicillin and isepacin for 4 weeks, and oral antibiotics were administered for the next several months. A cardiac catheterization was performed 50 days after admission. Coronary angiography showed severe stenosis in proximal site of right coronary artery. Right atrium and ventricular pressure were shown by fluid filled record. Right atrium average pressure and right ventricular systolic pressure demonstrated elevated level (17 mmHg and 38 mmHg, respectively). Right ventricular pressure in diastole showed a dip and plateau (Fig. 2). This paper was recorded by 50 mm per 1 s. These were associated with constrictive pericarditis and a pericardial effusion of mild size remained on the echocardiography. As stated above, we diagnosed subacute ECP. C-reactive protein returned to within normal limits, and the pericardial effusion disappeared after 2 months. He did not develop recurrent pericarditis or right heart failure. On cardiac catheterization after one year,

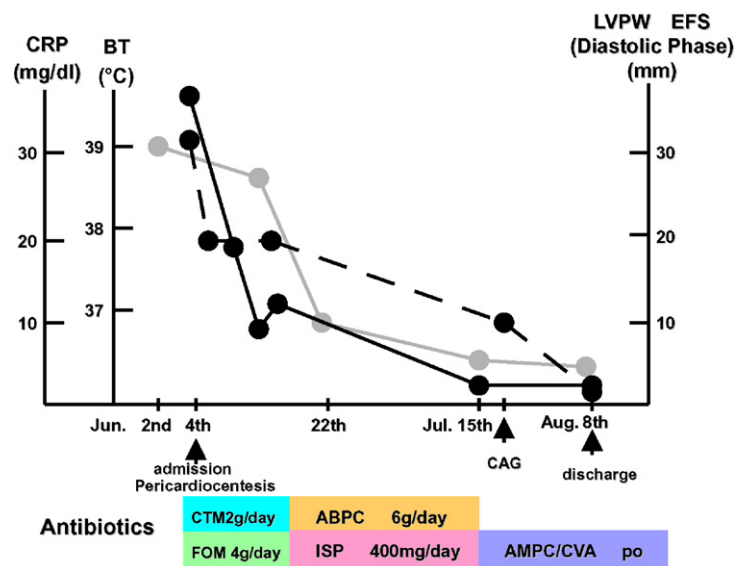


Figure 1 Clinical course of the patient. Solid, gray and dotted lines indicate C-reactive protein (CRP), body temperature (BT) and echo free space of left ventricular posterior wall (LVPW EFS). CTM; cefotiam dihydrochloride, FOM; fosfomycinsodium/calcium, ABPC; ampicillin, ISP; isepamicin sulfate, AMPC/CVA; potassium clavulanate amoxicillin.

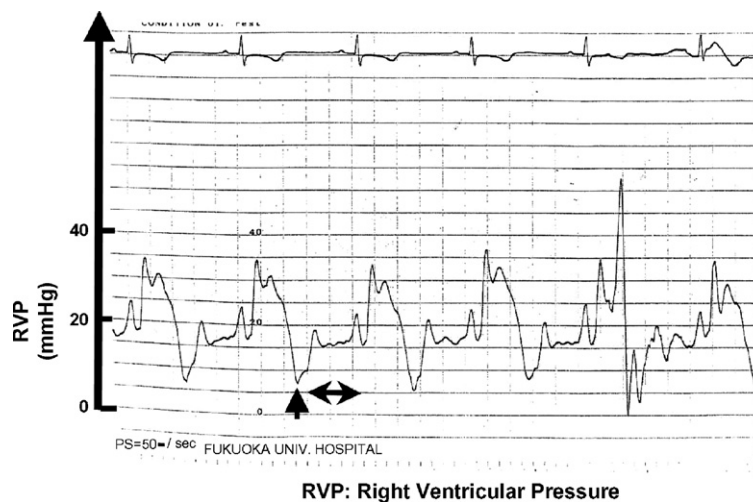


Figure 2 On cardiac catheterization, right ventricular pressure in diastole showed dip and plateau.

right ventricular pressure did not show a dip and plateau.

Discussion

Purulent pericarditis represents about 1% of acute pericarditis. It may be more acute, and is often associated with high fever, shaking chill and sepsis. It usually occurs with *Streptococcus pneumoniae*, *Hemolytic streptococcus*, *Staphylococcus aureus*, *Nesseria* and *Legionella* [3]. There are few case reports of pericarditis with non-typhoidal salmonella. There have been less than 30 case reports; *S. typhimurium* was the most frequently isolated, and represents about 50% of reported cases [4]. Purulent pericarditis with *S. enteritidis* has rarely been reported. Non-typhoidal salmonella may spread from gastrointestinal tract or abscess to the pericardium through blood. Although a stool culture sample did not show bacteria *S. enteritidis*, there is a possibility to be infected from a carrier of the bacteria because he had a habitual enema using coffee.

Important predisposing factors for the development of pericarditis include immunosuppression with underlying disease or immunotherapy, and pre-existing pericardial effusion with uremia or thoracic surgery [5]. We thought that the present patient might be an immunocompromised host based on CD4/CD8 depression, but he did not have any underlying diseases (e.g. malignant disease, HIV infection, abscess or blood disease) and had not been treated with a steroid or immunosuppressive agent. The measurement of CD4/CD8 was required

when purulent pericarditis was improved. CD4/CD8 depression might transiently be admitted. Hancock [6] first reported ECP including diagnosis and hemodynamic feature. Due to combined clinical course, cardiac catheterization and echocardiography, we diagnosed subacute ECP. Further evaluation of right atrium pressure waveform (type W) and manometer sticking on the catheter tip was required for the precise diagnosis of ECP.

Purulent pericarditis sometimes presents serious clinical course to cardiac tamponade or cardiac death, and diagnostic aspiration, pericardiocentesis [7] and long-term antibiotic therapy are required. Dolin et al. [8] reported the only previous case in 1991, and the present case might be the second case. Due to the long-term use of antibiotics without an operative procedure, his hemodynamic state improved. He did not develop recurrent pericarditis or right heart failure due to constrictive pericarditis.

References

- [1] Cohen JI, Bartlett JA, Corey GR. Extra-intestinal manifestations of *Salmonella* infections. *Medicine (Baltimore)* 1987;66:349–88.
- [2] Sagrista-Sauleda J, Angel J, Sanchez A, Permanyer-Miralda G, Soler-Soler J. Effusive-constrictive pericarditis. *N Engl J Med* 2004;350:469–75.
- [3] Spodick DH: Pericardial disease. in *Heart Disease: A Textbook of Cardiovascular Disease* (ed by Braunwald E, Zipes DP, Libby P), 6th Ed. WB Saunders, Philadelphia, 2001; pp. 1823–76.
- [4] Haggman DL, Reham SJ, Moodie DS, Mackenzie AH. Nontyphoidal *Salmonella pericarditis*. A case report and review of the literature. *Pediatr Infect Dis* 1986;5:259–64.

- [5] Kiuchi K, Endo T, Nejima J, Okamatsu K, Takayama M, Takao T, et al. Purulent pericarditis with tamponade caused by *Salmonella enteritidis*. *Jpn Circ J* 1998;62:139–41.
- [6] Hancock EW. On the elastic and rigid forms of constrictive pericarditis. *Am Heart J* 1980;100:917–23.
- [7] Lange RA, Hillis LD. Acute pericarditis. *N Engl J Med* 2004;351:2195–202.
- [8] Doig JC, Hilton CJ, Reid DS. Salmonella: a rare cause of subacute effusive-constrictive pericarditis. *Br Heart J* 1991;65:296–7.

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