Cardiac Tamponade Secondary to Purulent Pericarditis

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Septic shock is a common practice in the emergency department. One should seek for the rare cause of shock such as cardiac tamponade when the patient is not responsive to aggressive fluid resuscitation and inotropic agents. We reported a case of lung empyema complicated with cardiac tamponade secondary to purulent pericarditis.

Key words: purulent pericarditis, shock, cardiac tamponade

Introduction

Severe septic shock is a common problem in the emergency department. When septic shock persists in a critically-ill patient despite aggressive treatment with fluid resuscitation and inotropic agents, in accordance with the guidelines for early goal-directed therapy of The Surviving Sepsis Campaign, the physician needs to consider other causes of shock, such as cardiac tamponade. We describe a 19 year-old man with necrotizing pneumonitis with lung empyema and purulent pericarditis complicated by cardiac tamponade and septic shock.

Case Report

A 19 year-old man who had Duchenne muscular dystrophy and had been bed-ridden in recent years, was brought to the emergency department because of aggravating shortness of breath and chest pain. In addition, a cough with productive sputum had been noted by his family for over 20 days. He had chills without fever. Physical examination revealed crackles over the left lung field and decreased breath sounds over the right lung field. The jugular veins could not be evaluated because of contracture of the neck muscles with the head turned to the right side. Tachycardia with the heart rates between 110-120 beats per minutes were noted along with cool, cyanotic extremities. Chest radiography revealed total opacity of the right lung (Fig. 1). Aggressive fluid resuscitation along with inotropic agents and empirical antibiotics were applied under the suspicion of septic shock. The shock status deteriorated despite aggressive resuscitation. Bed-side sonography was performed for evaluation of cardiac function and other possible infectious foci. *Focus echocardiography revealed a massive pericardial effusion with heterogeneous contents, diastolic collapse of the right ventricle and inferior vena cava plethora. Central venous catheterization via the left internal jugular vein revealed elevated pressure (31 mmHg). A cardiologist was consulted for a pericardiocentesis under the impression of purulent pericarditis with cardiac tamponade. Pus-like pericardial effusion with foul odor was drained. Hypotension and
peripheral cyanosis improved gradually after the pericardiocentesis.

Computed tomography of the chest revealed multiple lobulation of lung empyema over the right lung and pericardial effusion under drainage (Fig. 2). The patient was admitted to the intensive care unit for further management. Intubation was performed because of respiratory failure. Gram stains of the pericardial effusion revealed abundant Gram negative bacilli. The patient responded poorly to empirical antibiotics, and pig-tail drainage of the purulent pericardial effusion and the empyema. Therefore, surgery consisting of decortication of the pleura, a wedge resection of the lung and drainage by two chest tubes was performed. He was given atracheostomy after 2 weeks of unsuccessful attempts to extubate. He was discharged in stable hemodynamic condition and was transferred to the respiratory care unit for further care.

Discussion

Several etiological spectrums can cause effusive-constrictive pericarditis, such as neoplasms, surgery, uremia, radiation, pus, tuberculosis and idiopathic causes\(^1\). Numerous infectious origins of purulent pericarditis have been reported such as Salmonella enteritidis\(^2\), bacteremic pneumococcal pneumonia\(^5\), methicillin-resistant Staphylococcal aureus in immunocompromised patients\(^4\), Neisseria meningitidis\(^5\), Klebsiella pneumonia in alcoholic patients\(^6\), anaerobic agents\(^7\), and amebae\(^8\). Many reports have mentioned cardiac tamponade secondary to purulent pericarditis\(^2,4,5,7\). The occurrence of cardiac tamponade depends on the rate of production of pericardial effusion and the pericardial reserve volume. Needle drainage of a pericardial effusion is done on an emergency basis when hemodynamic status worsens\(^9\).

Early goal-directed therapy is applied in patients with severe sepsis and septic shock, and it improves survival\(^10\). Control of the source of the infection such as empyema and abscess is also suggested. In addition to its improvement of hemodynamics, early drainage of purulent pericardial effusion can also be considered a kind of infectious focus control. Some case reports have mentioned the coexistence of pulmonary disease (such as pleural effusion or empyema) and purulent pericarditis, and one complicated case of purulent pericarditis secondary to left side

Fig. 1 Chest radiography revealing total opacity of the right lung
Cardiac tamponade

pneumonia was reported. Hence, when a patient develops persistent septic shock despite aggressive fluid resuscitation and the use of inotropic agents, cardiac tamponade should be considered in the differential diagnosis. When treating cardiac tamponade, increasing the fluid volume may only help in patients with hypovolemia. On the other hand, in patients with normovolemia and hypervolemia, volume infusion may increase intracardiac pressure and heart size, which in turn increase pericardial pressure and further reduce the cardiac output. Doppler echocardiography is the principal tool for diagnosing pericardial effusion and cardiac tamponade. Once cardiac tamponade is diagnosed by echocardiography, emergency drainage can dramatically improve a patient’s unstable hemodynamic status, especially in those with purulent pericarditis.

References

化膿性心包炎造成心包膜填塞

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敗血性休克是急診醫師日常工作中常常須面對的。當嚴重休克病患對積極液體復甦和升壓劑沒有反應時個都應該尋求一些罕見造成休克因素如心臟填塞。在此我們提出一份案例報告關於化膿性心包炎併發心包膜填塞。

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