Multiple myocardial abscess caused by septicopyemia after blocking therapy in the knee: a rare presentation

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Abstract: Myocardial abscess is considered to be a rare and usually fatal disease, which is often located in the myocardium, endocardium and valves. Myocardial abscess secondary to the infective endocarditis has been well described in literatures. However, it is now relatively uncommon that the myocardial abscess is formed in the setting of septicopyemia. Here, we present a case on multiple myocardial abscesses on the anterior wall of the left ventricle and septicopyemia by Staphylococcus aureus after receiving a blocking therapy in the left knee with an unsterile syringe.

Key Words: myocardial abscess, septicopyemia, staphylococcus aureus

Myocardial abscess, a suppurative infection, is often located in the valves, endocardium and myocardium [1]. This rare but life-threatening disease is usually secondary to the direct spread of bacterial infection from vicinity, such as infective endocarditis [2], or rarely caused by the septicopyemia from a remote tissue. During the past, an early diagnosis of myocardial abscess was very difficult, and most cases of myocardial abscess were usually found at autopsy due to the rapid deterioration of these patients’ clinical conditions. By now, with the help of various means of imaging, a suspicion of this disease can be timely made. Followed by an aggressive antibiotic therapy in combination with the prompt surgical procedure, the patient’s life may be saved.

Although myocardial abscess is often secondary to the infective endocarditis, it is now relatively uncommon that this disease occurred in the setting of septicopyemia. Here, we report a case on multiple myocardial abscesses caused by the septicopyemia spreading of Staphylococcus aureus infection.

Case report

A 63 year old man with no past medical history was admitted to a local clinic with pain and malaise in the left knee. In order to relieve the localized pain, the patient received a blocking therapy in the left knee with an unsterile syringe. However, it did not relieve the symptoms, and a local infection was caused. Due to the absence of prompt treatment, the infection was worsened and the septicopyemia occurred. During the following one month, the patient’s health was sustained to be deteriorated and died finally, and moreover, no records of laboratory tests were present. So an autopsy was performed to elucidate his cause after 24 hours.

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Post-mortem examination of the heart showed the heart weighted 310g, and the left ventricle appeared obvious hypertrophy. Extensive taupe lesions were observed through the endocardial surface of the anterior wall of the left ventricle. Surprisingly, several beige nodules were found prominently on the epicardial surface of the lesion areas (Figure 1). However, there were no remarkable changes in the valves and cardiac system. In addition, other significant findings were large areas of necrosis in the musculature of left knee and several subcapsular abscesses in bilateral kidneys.

Under the light microscope, abscess formation was confirmed in the anterior wall of the left ventricle. The myocardial abscess composed of extensive necrotic tissues infiltrated by numerous neutrophil granulocytes (Figure 2). Besides there are numerous neutrophil granulocytes in the border of the massive coagulation necrosis of left knee.

Bacterial culture of blood and the myocardial abscess showed a large number of gram-positive cocci, which proved to be Staphylococcus aureus.

So the old man was dead due to the circulatory failure secondary to the extensive myocardial necrosis, Neutrophil infiltration and myocardial abscess.

**Discussion**

Myocardial abscess is a rare disease, but it is usually life-threatening. The incidence of this disease confirmed at autopsy varies from 0.2% and 0.56% to 1.5% [3], however, the mortality is up to 42% with the presence of Staphylococcus aureus endocarditis and much higher when there is formation of intracardiac abscess [1]. Based on the clinical associations, myocardial abscess is most likely to be formed when there is infective endocarditis or septicopyemia. To date, various bacterial species have been identified as the infecting organism for the myocardial abscess formation, of which Staphylococcus aureus is reported to be the most common Bacteria in cases [4].
The initial local infection of left knee was caused by the unsterile syringe during the process of blocking therapy in the case. In that stage, the patient should be treated with appropriate antibiotic according to the bacterial specie to control the infection. Unfortunately, no medical procedures were performed on this patient and the septicopyemia occurred.

In this setting, the myocardial infection was caused by the infective organism seeded in the myocardium via collateral vessels. Then significant myocardial necrosis occurred in the infected areas. The necrotic myocardium in combination with its inflammatory exudate provided a good circumstance for the growth of infective organism. On the other hand, the mural thrombus led to the insufficient blood perfusion to the infected areas, which also keep the infective organism from the immune response action. As a result, in contrast, renal abscesses in this case was more common in such a condition. Owing to its inherent drainage, the kidney may be more easily infected by the organism and more likely to form abscesses [5].

According to the previous literature, most cases of myocardial abscess in association with a septicopyemia were reported to have abscesses in other organs at autopsy [6]. And theses abscesses were often found in the kidney, lung and brain. When compared with these abscesses, the myocardial abscess was smaller and fewer. The reason for this is that the patients’ clinical conditions deteriorate rapidly in the setting of septicopyemia, and a death will be soon caused, thus there was not enough time for the development of myocardial abscess.

Presently, the preoperative diagnosis of myocardial abscess is very difficult, and the detection of this rare disease is mainly with the aid of imaging, for example, echocardiography, cardiac CT, cardiac MRI as well as radionuclide scintigraphy. Among these means, the traditional 2D echocardiography and cardiac CT have a low sensitivity [7, 8], and the radionuclide scintigraphy including gallium-67 and indium-111 scanning has not been widely used, and its sensitivity remains to be further evaluated [9, 10].
In contrast, cardiac MRI with its high resolution can yield much better diagnostic results [11]. Recently, a real-time 3D contrast echocardiography proves to be a valuable tool for the accurate location of the myocardial abscess, which can provide precise morphological information to ensure a successful surgical treatment [12].

Base on a prompt diagnosis, patients may be saved from this fatal disease by aggressive antibiotic therapy and urgent surgical treatment [13]. Actually, more than one organism is found in 40% cases of myocardial abscess, thus combined using of large-dosage antibiotic according to different bacterial species is necessary for the control of infection. Besides, the perioperative risk and the risk of rupture will greatly increase due to the rapid progression of this disease, hence prompt surgical treatment is recommended in most cases.

In summary, multiple myocardial abscesses caused by the septicopyemia spreading of infection is now relatively uncommon, but it is usually a fatal threat for the patients. Treatment for this disease calls for an early diagnosis by various means of imaging and aggressive antibiotic therapy in combination with prompt surgical procedure, thus the patient’s life may be saved.

Conflicts of interest: The authors have no relevant conflicts of interest to declare.

References