

Clinical diagnosis

Case 347

2. Septic emboli

[Progress]

He was admitted in intensive care unit. Thereafter, he was transported to other hospital where highly advanced medical care was served.

[Discussion]

Septic emboli are composed of accumulation of bacillus covered with fibrous network. Bacilli in blood are usually attacked by immune cells of macrophages and neutrophils. Then, they are usually phagocytosed by immune cells and often difficult to proliferate in blood. However, it is reported that they might survive and proliferate in heart valves or endocardium where no vasa vasorum exists, indicating least chance of immune cells to reach (1, 2). Fibrous networks are composed of DNA coming from macrophages and neutrophils. Namely, at the last maneuver to expel bacteria, immune cells use their DNA to trap bacteria in exchange of their own existence.

Bacteria in blood is thought to proliferate in heart valve where vasa vasorum least develops, leading immune cells hardly work (1-3). When they proliferate at tricuspid valve, pulmonary septic emboli occur. When they proliferate at mitral valve or left atrium appendage, septic emboli occur whole body including brain, upper and lower extremities (4-7).

The size of bacillus is around 1 micrometer, while that of red blood cell is around 7 micrometers. The accumulated bacilli with fibrous network reach and occlude minute vessels. Then, septic emboli cause ischemic damages to vessels of toes, digits and retina. Small painful red spots at digit, palmar & plantar or retina formed by bacilli mass are called Osler node, Janeway lesion, and Roth spots (5, 6). Septic emboli are also found in fingernail and eye palpebrae (5, 6).

Septic emboli can occur in any kind of bacillus. Of these, streptococci and staphylococci are two most causing septic emboli. The symptoms of septic emboli by staphylococci are more fulminant such as causing acute endocarditis and cardiac valve fistula than those by streptococci which are moderate or mild subacute endocarditis (6). In our case, the pathogen was streptococci. Endocardium and heart valve are easy habitant portion for bacilli proliferation, causing endocarditis and inducing septic emboli.

[Summary]

We presented a fifty-year-old male for high fever, hypotension, and painful swollen cyanotic digit. He was diagnosed septic emboli based on symptoms and laboratory data. It is borne in mind that septic emboli cause ischemic damage to digit and toes because minute bacilli mass covered with fibrous network composed of DNA of neutrophils or macrophages. Bacilli mass is formed in endocardium & heart valve where vasa-vasorum is least present and immune cells hardly reach. When bacillus mass is formed in tricuspid valve, pulmonary septic emboli can occur, while it is formed in mitral valve or left appendage, septic emboli to minute vessels in brain and toe & digit can occur.

[References]

- 1.Thalin C, et al. Neutrophil extracellular traps.: villains and targets in arterial, venous, and cancer—associated thrombosis. *Arterioscler Thromb Vas Biol* 39; 1724-1738, 2019
- 2.Stark K, et al. Interplay between inflammation and thrombosis in cardiovascular pathology. *Nat Rev Cardiol* 18; 666-682 2021.
- 3.Heiro M, et al. Infective endocarditis in a Finnish teaching hospital: a study on 326 episodes treated during 1980–2004. *Heart*. 2006; 92: 1457–62. doi:10.1136/hrt.2005.084715. PMC 1861063
- 4.Morris AM. How best to deal with endocarditis. *Curr Infect Dis Rep*. 2006 8 (1): 14–22. doi:10.1007/s11908-006-0030-8. PMID 16448596.
- 5.Kasper DL, Brunwald E, Fauci AS, Hauser S, Longo DL, Jameson JL (2005). *Harrison's Principles of Internal Medicine*. McGraw-Hill. pp. 731–40. ISBN 0-07-139140-1. OCLC 54501403.
- 6.Stawicki SP, et al. Septic embolism in the intensive care unit. *Int J Crit Illn Inj Sci*. 2013 Jan-Mar; 3: 58–63. doi: 10.4103/2229-5151.109423
- 7.Avery RK, et al. *Listeria monocytogenes* tricuspid valve endocarditis with septic pulmonary emboli in a liver transplant recipient. *Transpl Infect Dis*. 1999;1:284–7.

[back](#)