Septic shock secondary to infection of a left ventricular thrombus

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Abstract

We report the case of a 45-year-old woman who developed severe shock with multiorgan failure requiring admission to intensive care. Endomyocardial biopsy was performed and she was diagnosed with sepsis secondary to left ventricular thrombus abscess. Surgery was contraindicated and the patient received exclusively medical treatment; the clinical course was satisfactory and the patient is alive one year later. An apical thrombus may rarely be complicated by infection. Although management normally requires surgical excision, medical management may be effective in situations in which surgery is contraindicated.

Keywords: Septic shock; Abscess; Left ventricle; Cardiac thrombus

1. Case report

The patient, a 45-year-old woman, had been diagnosed with paranoid schizophrenia in youth and had multiple admissions for this condition; her quality of life was poor. Her cardiovascular risk factors included smoking, obesity, non-insulin dependent diabetes mellitus, and dyslipidemia. She was first seen in our hospital in May 2007, 72 h after the onset of symptoms of an anterior myocardial infarction with ST elevation. Coronary angiography revealed disease of the anterior descending artery and this was treated with two stents, achieving a good angiographic result. There was persistence of anterograde and septal apical akinesia and the left ventricular ejection fraction (LVEF) was 48%. Treatment was prescribed with omeprazole, acetylsalicylic acid, clopidogrel, enalapril, carvedilol, atorvastatin, gliclazide, and olanzapine, although poor compliance was suspected due to her mental disorder.

Two months later she was admitted to the intensive care unit (ICU) for septic shock of unknown origin, isolating methicillin-sensitive Staphylococcus aureus in three consecutive blood cultures. She required norepinephrine for 48 h and teicoplanin – subsequently vancomycin – for 21 days. The clinical course was favorable, although the origin of the infection was not discovered.

In December 2007, she returned to the emergency department in shock, with a 1-week history of grade IV dyspnea (NYHA classification) and fever. The blood pressure was 65/35 mmHg, heart rate 135 bpm, and temperature 30.8 °C. Glasgow coma score was 5. She was tachypneic, with abdominal respiration, raised jugular venous pressure, labial cyanosis, and diaphoresis. Auscultation revealed a gallop rhythm, a grade II/IV apical systolic murmur, and a global reduction in breath sounds with bilateral basal crepitations. There was marked pitting edema in lower limbs. Cardiomegaly and pulmonary congestion were observed on the chest radiograph and blood tests revealed 15,600 leukocytes/µl (78% neutrophils) and 169,000 platelets/µl. Cardiac biomarkers were normal. The patient was admitted to ICU, requiring invasive mechanical ventilation and norepinephrine infusion. Renal and hepatic function deteriorated, and it was necessary to start continuous venous hemofiltration (CVVHDF). She was febrile (39.5 °C) and splinter hemorrhages, suggestive of septic emboli, appeared in the distal regions of limbs. The complementary tests performed to find the focus of infection (urine culture, bronchoalveolar lavage) were negative. Transthoracic and transesophageal echocardiography with contrast (Levovist) were then performed (Fig. 1), showing a dilated left ventricle with severe dysfunction (LVEF, 24%) and dyskinesia of the septal, anterior, inferior, and apical segments. A hypoechoogenic mass of 40×25 mm surrounded by a hyperechoic band was observed within the left ventricle, and there were anechogenic areas within the mass; these findings were compatible with an apical thrombus. There was severe diastolic dysfunction, with a restrictive pattern and a pulmonary capillary wedge pressure of 35 mmHg. Grade II mitral insufficiency and tricuspid insufficiency were pres-
ent, with severe pulmonary hypertension (70 mmHg). Monitoring using the PiCCO system showed signs of a reduced contractility, a fall in systemic vascular resistance, and an increase in extravascular lung water.

Empirical treatment was started with vancomycin, rifampicin, amikacin, and amphotericin B, and the cardiovascular surgery department was contacted. Surgeons initially rejected surgical treatment due to the patient's high risk (EuroSCORE, 20 points), and suggested biopsy. After achieving hemodynamic stability, biopsy of the left ventricular mass was performed; this was reported as thrombotic material with marked fibrinoleukocytic infiltrate, compatible with an abscessified thrombus (Fig. 2). Culture of the biopsy was not conclusive. Serial blood cultures remained positive for methicillin-sensitive S. aureus. The subsequent echocardiographic images showed a decrease in the volume of the thrombus associated with septic embolization, which coincided with a deterioration in the state shock.

The patient remained in the ICU for two months, initially in shock complicated by multiorgan failure (renal failure with CVVHDF, pulmonary edema, prolonged mechanical ventilation, hepatic, neurological and intestinal dysfunction). The clinical course was complicated by a right basal pneumonia due to Acinetobacter baumanii, critical illness polyneuropathy, and upper gastrointestinal hemorrhage, but improvement finally occurred and the size of the thrombus decreased, although it did not disappear completely, and was still visible after six months of follow-up.

2. Discussion

The presence of ventricular thrombi is a well-recognized complication of acute myocardial infarction and left ventricular dysfunction [1]. However, in medical literature there is little information about the infectious processes that can develop in these abscesses [2–4] or their complications—they may be underdiagnosed.

When sepsis develops, an infectious focus must be sought. In our patient, all screening tests were negative, leaving infection of the intraventricular thrombus as the only possible origin. The presence of septic emboli supported this hypothesis, and it was subsequently confirmed by biopsy of the thrombus, although culture of the biopsy material was unfortunately negative. The majority of cases studied were caused by Salmonella species, though in our case serial blood cultures were positive for S. aureus despite treatment with vancomycin. Echocardiography was not performed during the patient’s first admission for sepsis, although S. aureus was isolated. If echocardiography had been performed, it would probably have detected the complication at that time; this would support the recommendation to perform echocardiography in patients with shock.

Another subject of discussion is whether or not to perform biopsy. This was probably indicated by the lack of information about the type of mass (suspected tumor), but biopsy of an intraventricular abscess can give rise to septic emboli, as occurred in our case, leading to a deterioration in the state of septic shock.

Anticoagulation with acenocoumarol after discharge was evaluated but was finally discarded because of the patient’s...
psychiatric history and poor adherence to treatment. Surgery was not considered initially because of the high surgical risk, opting for conservative treatment with antibiotic therapy. Although most of few cases reported in the literature were managed surgically (usually by ventriculotomy and thrombectomy) [4–8], treating this condition as a surgical emergency, our case is an example of successful medical management that, although it cannot be recommended, may be considered when the surgical risk is unacceptable.

3. Conclusion
An apical thrombus can be complicated by infection on rare occasions. Although surgical excision is the treatment of choice, medical management may be effective in those situations where surgery is contraindicated.

References