Severe Bleeding after Antithrombotic Therapy in Urosepsis Masquerading as Myocardial Infarction

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Abstract

Cardiac dysfunction is common in patients with severe sepsis and septic shock. We present a 71-year-old woman with Escherichia coli urosepsis and sepsis-induced myocardial injury masquerading as non-ST elevated myocardial ischemia. Spontaneous psoas hematoma requiring blood transfusion and intracranial hemorrhage developed after antiplatelet and anticoagulant therapies, even in therapeutic doses. The patient was managed conservatively and recovered well with minor residual hemiparesis. Bleeding complications are a common risk of antithrombotic therapy. It is therefore crucial to weigh the impact of efficacy against safety. Old age, female gender, renal insufficiency and sepsis character increased the risk of bleeding in this patient. A misinterpretation of elevated cardiac troponin I may give rise to a diagnostic dilemma and cause unnecessary morbidity.

Key words: anticoagulant, myocardial dysfunction, psoas hematoma, sepsis, troponin I

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Introduction

Cardiac dysfunction is common in patients with severe sepsis and septic shock (1). It is sometimes difficult to diagnose true coronary artery disease in patients with severe sepsis prior to coronary angiogram. Antithrombotic therapy in coronary artery disease contributes to the reduction of serious cardiovascular events, but it has the traditional risks of bleeding complications. Here, we report a 71-year-old woman with Escherichia coli urosepsis and sepsis-induced myocardial injury masquerading as non-ST elevated myocardial ischemia. Spontaneous psoas hematoma requiring blood transfusion and intracranial hemorrhage developed after antiplatelet and anticoagulant treatment, even in therapeutic doses.

Case Report

A 71-year-old woman presented to local hospital on a remote island of Taiwan, with fever, chills, dysuria and anterior chest tightness for 1 days. She was previously fit and well. Urinary tract infection with septic shock was diagnosed. She received antibiotic treatment, aggressive fluid resuscitation and high-dose inotropes. In addition, the initial 12-lead electrocardiography (ECG) revealed slight ST segment depression in leads V2-4 (Fig. 1a). Cardiac enzyme analysis showed a creatine kinase (CK) of 79 U/L (reference range, 0-140 U/L), creatine kinase MB isoenzyme (CK-MB) of 8 U/L (reference range, <5 U/L), and cardiac troponin I (cTnI) of 2.51 ng/mL (reference range, 0-0.05 ng/mL). Because of limited medical manpower and facilities on a remote island, neither coronary angiogram nor echocardiography was performed at that time. Due to persistent chest discomfort, non-specific ST-T change of the ECG and elevated serum cTnI, aspirin (300 mg loading dose), clopidogrel (300 mg loading dose) and enoxaparin (1 mg/kg subcutaneous every 12 hours) were administered with the suspicion of non-ST elevated myocardial ischemia. One day after initial presentation, she was referred to our emergency department...
Figure 1. The precordial leads of ECG revealed slight ST segment depression in leads V2-4 at the initial presentation (a) and normal sinus rhythm 1 day before discharge (b).

Figure 2. Contrast-enhanced abdominal CT showed the right psoas hematoma.

Figure 3. Brain CT showed intracranial hemorrhage at the right parietal lobe.

(ED) on the main island of Taiwan via emergency air medical transport service. At our ED, white cell count was 30,500/mm³ with a left shift (band, 6%; segment, 79%), hemoglobin was 9.6 g/dL, and platelet count was 76,000/mm³. C-reactive protein level was 24.06 mg/dL (reference range, <0.5 mg/dL). Cardiac enzymes indicated a CK of 1,515 U/L, CK-MB of 39 U/L, and cTnI of 2.02 ng/mL. The prothrombin time international normalized ratio (PT-INR) was 1.34 and activated partial thromboplastin time (APTT) was 39.6 seconds (reference range, 23.9-35.5 seconds). Bedside transthoracic echocardiography demonstrated a structurally normal heart and mild left ventricle dysfunction with an estimated ejection fraction of 45%. An enhanced computed tomographic scan was ordered to evaluate the right lower quadrant abdominal pain and a fall in hematocrit level from 27.7% to 19.3%, which demonstrated a 6.9×6.9×8.6 cm hematoma of the right psoas muscle (Fig. 2). She was managed conservatively, including antibiotics with levofloxacin, hemodynamic support, blood transfusion, and immediate discontinuation of antiplatelet and anticoagulant therapy. The blood culture yielded *Escherichia coli*. Her hospitalization course was complicated with spontaneous intracranial hemorrhage at right parietal lobe on the second hospital day (Fig. 3), and acute renal failure. The chest symptoms im-
Table 1. Time-course of Serum Cardiac Enzymes

<table>
<thead>
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<th>Day -1</th>
<th>Day 0</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 5</th>
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<td>CK</td>
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<td>1515</td>
<td>666</td>
<td>852</td>
<td>570</td>
<td>114</td>
</tr>
<tr>
<td>CK-MB</td>
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<td>39</td>
<td>21</td>
<td>45</td>
<td>31</td>
<td>16</td>
</tr>
<tr>
<td>Tropinin I</td>
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<td>2.02</td>
<td>1.40</td>
<td>1.05</td>
<td>0.46</td>
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CK, creatine kinase; CK-MB, creatine kinase MB isoenzyme; Day 0, day of admission.

proved gradually and subsided one week after hospitalization. Serial echocardiography showed improvement of cardiac function that correlated closely with decreased serial cardiac enzymes (Table 1), proving sepsis-related myocardial injury. On the 17th hospital day, echocardiography demonstrated preserved left ventricle ejection fraction (LVEF=52%) without regional wall motion abnormality. The patient recovered well with minor residual hemiparesis and was discharged later in stable condition. One day before discharge, ECG showed normal sinus rhythm (Fig. 1b).

Discussion

Myocardial dysfunction, which is characterized by transient biventricular impairment of intrinsic myocardial contractility, is a common complication in patients with sepsis (1). The elevation of cTnI levels in patients with severe sepsis, or septic shock has been shown to indicate left ventricular dysfunction and a poor prognosis (1). The pathophysiological mechanisms of elevated cTnI other than thrombus-associated myocardial damage might play a major role, including cytokine-mediated reversible myocardial membrane leakage and/or apoptosis in sepsis and septic shock (1-4). Cardiac function usually recovers within 7-10 days in survivors (2). Current treatment for sepsis-induced cardiac dysfunction is based on appropriate treatment for the infectious focus and hemodynamic support (4).

Elevated cardiac biomarkers in conjunction with ECG changes are valuable in diagnosing acute coronary syndrome (ACS). Abnormal values of cTnI were detected in a variety of diseases not related to ACS (5). Elevated cTnI is frequently observed in patients with severe sepsis and septic shock even in the absence of a thrombotic ACS (6). The ECG abnormalities due to extra cardiac systemic disease have been well described. Some of the ECG findings associated with septic shock include the loss of QRS amplitude, increase in QTc interval, bundle branch blocks, Osborn waves, or even masquerading as ST-segment elevation (7). Echocardiographic studies suggest that 40% to 50% of patients with septic shock develop myocardial depression (2). Also, the subsidiary non-invasive echocardiography is highly dependent on the operator and reader, and may be less useful in patients who have preexisting wall motion abnormalities. Making accurate measurements of cardiac function is difficult and this is confounded by the inherent difficulty of excluding patients with true coronary insufficiency with sepsis prior to coronary angiogram. Antithrombotic therapy in coronary artery disease had contributed to a substantial reduction of serious cardiovascular event. Major bleeding remains a significant complication of ACS management and is associated with worse outcome (8, 9). In the present case, the ST depression in leads V1-4 was slight and not specific for the myocardial infarction. Even if cTnI release indicates myocardial injury, it is not always synonymous with ischemia or infarction. The use of aspirin, clopidogrel, and enoxaparin was inadequate at that time. Consumption coagulopathy is a common phenomenon in sepsis. Administration of antiplatelet and anticoagulant agents in patients with sepsis and positive cTnI may pose bleeding risks. It is therefore crucial to weigh the impact on efficacy against safety. Old age, female gender, renal insufficiency and sepsis character increased the risk of bleeding in the present patient (8).

Antiplatelet and anticoagulant therapies are associated with various hemorrhagic complications. Spontaneous psoas hematoma is rare but well documented as a complication of antiplatelet or anticoagulant therapy for various diseases, even in therapeutic doses (10-12). Treatment of spontaneous psoas hematomas depends on the speed of onset, volume and degree of neurological impairment (13). Conservative treatment resulted in a good outcome in most cases (10, 12). Surgical treatment or transcatheter arterial embolization might be considered if patients remain hemodynamically unstable or presented severe femoral neuropathy (10-12, 14).

In conclusion, a misinterpretation of elevated cTnI may give rise to a diagnostic dilemma and cause unnecessary morbidity. Given the lack of supportive data at present, patients with sepsis-associated myocardial dysfunction are generally not treated with antithrombotic agents. Rather, the underlying cause of the cTnI elevation should be targeted. Major bleeding, such as psoas hematoma or intracranial hemorrhage, should be considered in any patient receiving antithrombotic therapy, even in therapeutic doses.

The authors state that they have no Conflict of Interest (COI).

References


