Subarachnoid hemorrhage that electrocardiographically mimics acute coronary syndrome: a case report

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Summary— Electrocardiography alterations and cardiac enzyme elevation have been reported in patients with cerebrovascular events in various articles. This case reports a case of syncope with an electrocardiography of atrioventricular complete block and extensive ST segment elevation. However, it was finally diagnosed as subarachnoid hemorrhage. To the best of our knowledge, this patient is the first case of subarachnoid hemorrhage mimicking ST elevation myocardial infarction with atrioventricular complete block.

Case Report

A 64-year-old female presented to the emergency department due to syncope. The patient was unconscious, and had no remarkable medical history. A complaint of chest pain, dyspnea or trauma history before the syncope was recorded. The patient was bradycardic (42/min) and hypotensive (80/50 mmHg) on admission, and had a score of 7 on the Glasgow Coma Scale. On ECG, AV complete block with ST elevations in leads II, III, and aVF. However, the patient was diagnosed with SAH. To the best of our knowledge, this is the first case of SAH presented as syncope with ST elevation myocardial infarction (STEMI) and AV complete block.
unconsciousness, and heparin was not administered. However, the rhythm was sinus and ST elevations were resolved immediately after angiography (Figure 1b). Normal coronary arteries, ventriculography and ascending aortography were detected (Figure 2a-c). Transthoracic echocardiography findings were all normal, but troponin I level was high (1.3 ng/mL). The patient's serum potassium concentration was 4.3 mmol/L and calcium concentration 9.6 mg/dL; other biochemical values were within the normal ranges.

The patient underwent a cranial computed tomography (CCT) due to unconsciousness, and this revealed a 5.2x3.1 cm subarachnoid hemorrhage in the right parietal lobe (Figure 3). A right posterior communicating artery aneurysm was detected with CCT angiography (Figure 4). The patient was promptly operated on by neurovascular surgeons, but death occurred intraoperatively.
**DISCUSSION**

ECG alterations and cardiac enzyme elevation have been reported in patients with cerebrovascular events in various studies.\(^1\,2\) SAH has been reported as the most commonly encountered cause, followed by cranial trauma, meningitis and cranial tumors as less common reasons.\(^3\,4\) The most prevalent ECG changes are nonspecific ST segment deviation, T wave inversion and QT interval prolongation.\(^5\,6\) ST segment elevation is extremely rare. Diffuse ST segment elevation without indicating any coronary artery territory may be a non-ischemic ECG finding.

Hypotension, pulmonary edema and systolic dysfunction may be seen in SAH patients. Moreover, troponin levels may be elevated following cerebral ischemia.\(^7\,8\) The unfavorable effect of cranial hemorrhage on the myocardium and coronary arteries is not well-established, albeit that the very high levels of catecholamines released during cerebral hemorrhages may lead to coronary vasoconstriction or direct toxic effect on myocardial cells, ultimately resulting in myocardial damage.\(^6\,7\) A possible mechanism for hemodynamic instability in the present case might be that hypotension developed secondary to the cranial hemorrhage, and it impaired the coronary perfusion, and consequently led to myocardial ischemia and caused complete AV block.

The differential diagnosis between STEMI and intracerebral bleeding is vital. Antiaggregant, antico-
agulant and fibrinolytic drugs are essential in STEMI treatment, while these medications are contraindi-
cated in intracerebral hemorrhages. Therefore, coronary
angiography is extremely important in the differential
diagnosis, especially in unconscious patients without
atherosclerotic risk factors and yet with ST elevation
on ECG. Intracranial bleeding should also be kept in
mind as an alternative diagnosis when coronary angi-
ography demonstrates normal coronary arteries. The
diagnosis and etiology of cranial hemorrhage can rap-

didly be determined in such patients by CCT and CCT

Probability of cranial hemorrhage should be con-
sidered in the absence of a serious lesion on coronary
angiography in unconscious patients with ST segment
elevation and AV block on ECG.

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REFERENCES


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