Atrial Septal Hematoma Immediately after Cardiac Surgery: Detection Using Transesophageal Echocardiography

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ATRIAL septal hematoma is a rare complication of dissecting aneurysm, aortic valve stenosis, aneurysm of the right coronary artery, and chest trauma.1–15 Although we can find 20 cases of this complication in the literature, there is no report describing early detection after cardiac surgery. We report a case in which atrial septal hematoma was found by transesophageal echocardiography after coronary artery bypass graft surgery.

Case Report

A 65-yr-old woman weighing 52 kg had a 5-yr history of unstable angina. She was admitted for coronary artery bypass graft surgery. She had been treated with 2 mg warfarin and 200 mg ticlopidine daily, and the prothrombin time was kept at 30%. Warfarin was discontinued 1 week before the operation.

After oral premedication with 10 mg diazepam and 75 mg oxazepam intravenously and maintained with 50 µg/kg fentanyl and 5 mg vecuronium intravenously and maintained with 50 µg/kg fentanyl in combination with inhalation of 0.1–0.3% isoflurane. The patient received 1,500 U heparin intravenously before the start of cardiopulmonary bypass. Activated coagulation time was maintained greater than 450 s during bypass. A catheter was inserted from the left superior pulmonary vein to the left atrium. Two superficial vein grafts were anastomosed to the coronary arteries. Cardiopulmonary bypass time was 4 h, 13 min. After the bypass, hemodynamics were maintained with 10 µg·kg⁻¹·min⁻¹ dobutamine, 0.5 µg·kg⁻¹·min⁻¹ nitroglycerin, and 1.5 µg·kg⁻¹·min⁻¹ diltiazem. There was no appreciable change on the electrocardiographic tracing after the bypass. She was transferred to the intensive care unit for routine postoperative treatment.

Three hours after arrival at the intensive care unit, her blood pressure decreased suddenly from 130/87 to 87/40 mmHg with concomitant increase in the central venous pressure from 6.8 to 11.3 mmHg. Prolongation of P–Q interval and 2-mm depression in the ST segment were observed in the electrocardiogram tracing. The patient was treated immediately with an intraprocedurally placed cardiac pacemaker. As the blood pressure did not increase, epinephrine was infused and increased blood pressure slightly. Cardiac tamponade was suspected, however, fluid was not observed in the pericardial space using transsthoracic echocardiography. Three hours later, a percutaneous intraaortic balloon was inserted to stabilize the patient's hemodynamics.

Coincidentally, we used transesophageal echocardiography to search for possible causes of unstable hemodynamics. In a four-chamber view, we found a 4 × 4-cm mass in the left atrium, which reduced transmural flow to the left ventricle, causing severe hypotension (fig. 1). Either a localized left atrial hematoma or a thrombus was the most likely diagnosis for the mass.

Two hours later, surgical exploration was performed during 50 µg/kg fentanyl and oxygen anesthesia. Both the right coronary artery and the left anterior descending artery graft were intact, and the flows were 100 and 60 mL/min, respectively. Occlusion of the right atrium, surgeons found the swollen atrial septum, in which they found a fresh blood clot. It extended from the connection of the left upper pulmonary vein to the mitral valve annulus. No communication was found between the hematoma and cardiac cavities. After removal of the 20-g blood clot, the patient was transferred again to the intensive care unit with the intraaortic balloon pumping in operation.

Her hemodynamics improved temporarily, however, acute renal failure developed. Despite continuous hemofiltration therapy, metabolic acidosis increased, and she died on the 2nd postoperative day.

Discussion

The early clinical signs of atrial septal hematoma are atrioventricular block on electrocardiogram tracing and decreased blood pressure. In some cases, the hematoma will rupture into a ventricle and form an atrioventricular shunt.14 Vyas et al.15 reported a patient who suffered from tricuspid insufficiency because of an atrial septal hematoma. In most of these patients, diagnosis was made after autopsy. Therapy was recommended for early surgical removal of the hematoma.

The mechanism underlying development of the septal hematoma is based on the communication of the int-
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Fig. 1. Atrial septal hematoma found using transesophageal echocardiography. H = hematoma; LV = left ventricle; RV = right ventricle.

terstitial tissue of the right atrial wall near the atrial septum with the aortral space. The atrial myocardiun in the aortral space is formed of loosely arranged muscle bundles that allow for the expansion of the hematoma. Hematoma of the atrial septum results if an adjacent high-pressure chamber or vessel ruptures into the aortral space. In our case, as surgeons did not find any communication from the hematoma to the cardiac cavity during exploration, damage to the atrial septum by the left atrial catheter could have caused the atrial septal hematoma. Concomitant use of anti-coagulants during cardiopulmonary bypass may have contributed to its formation.

Rowe et al. reported hematomas that were found using transthoracic echocardiography. However, transthoracic echocardiography is sometimes inadequate to detect atrial lesions. Because the left atrium is located close to the esophagus, transesophageal echocardiography is superior to transthoracic echocardiography to make a diagnosis atrial lesions. Roudaut et al. found an atrial septal hematoma by transesophageal echocardiography.

Transesophageal echocardiography is recommended as an excellent hemodynamic monitor during cardiac surgery. This case illustrates that transesophageal echocardiography may be a useful monitor during the immediate postoperative period.

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References