Case report - Coronary

Pituitary apoplexy with third cranial nerve palsy after off-pump coronary artery bypass grafting

Tomohiro Mizuno*

Department of Cardiovascular Surgery, Machida Municipal Hospital, 2-15-41 Asahi-machi, Machida, Tokyo 194-0023, Japan

Received 11 February 2011; received in revised form 28 March 2011; accepted 1 April 2011

Abstract

We present a rare case with pituitary apoplexy after three-vessel off-pump coronary artery bypass grafting (OPCAB). The patient exhibited right third cranial nerve palsy; ptosis of the right eye with completely dilated pupils and a loss of reflex to light after the effects of anesthesia completely subsided. The patient underwent endonasal transsphenoidal resection of the pituitary gland 14 days after the OPCAB, and the symptoms completely disappeared 40 days after the resection. OPCAB is recommended for patients with known pituitary tumor who require coronary artery bypass grafting, but OPCAB also has a risk of pituitary apoplexy. The present case report is the first to describe pituitary apoplexy after OPCAB. Pituitary apoplexy is a very rare complication after cardiac surgery, but cardiac surgeons should know the disease and quickly diagnose it to avoid severe brain injury.

© 2011 Published by European Association for Cardio-Thoracic Surgery. All rights reserved.

Keywords: Coronary artery bypass grafts surgery; Off-pump surgery; Cranial nerves; Pituitary apoplexy; Neuroendocrine tumor

1. Case report

A 73-year-old male with hypertension and chronic three-vessel coronary artery disease was admitted to our hospital for elective coronary artery bypass grafting (CABG). The baseline blood pressure measured in his left hand was 124/80 mmHg, but the blood pressure in the right hand was 182/90 mmHg. Computed tomographic angiography of the aortic arch revealed severe stenosis of his left subclavian artery. Preoperative cranial computed tomography (CT) was not performed because physical examination at admission did not reveal any neurological deficit including visual loss and cranial nerve palsy. General anesthesia was induced and maintained by administration of fentanyl, midazolam, pancuronium, propofol as well as inhalation of sevoflurane. The patient was monitored using an arterial catheter inserted into his right radial artery, a pulmonary artery catheter, and transesophageal echocardiography. Three-vessel off-pump coronary artery bypass grafting (OPCAB) with right internal thoracic artery, right gastroepiploic artery and saphenous veins was performed. HEART String, a proximal seal system, was used for the proximal anastomoses to the ascending aorta.

The systolic arterial pressure was maintained at 90–145 mmHg during the surgery because cardiopulmonary bypass was not used during surgery. The initial dose of heparin was 9 ml and the activated clotting time (ACT) initially increased from 155 s to 574 s. Heparin was again infused 90 min after the initial infusion when the ACT returned to 254 s. An additional 6 ml of heparin (the doses were 2 ml, 3 ml and 1 ml) was infused during the procedure. After all the bypass procedures were performed, heparin was neutralized by administration of protamine (3 ml). The duration for three-vessel CABG was 150 min, and that of heparinization was 239 min. Blood transfusion was not performed.

The effects of anesthesia completely subsided four hours after the surgery. At this point, the patient was alert and palsy of his extremities was not observed, but exhibited ptosis of the right eye with completely dilated pupils; a loss of reflex to light was also observed. The postoperative circulatory and respiratory functions were normal. Further, other neurological deficits were not observed 12 h after the surgery, when the patient was extubated. A neurological examination of the patient revealed right third cranial nerve palsy. Cranial CT and magnetic resonance imaging (MRI) revealed a large suprasellar mass with bleeding (Fig. 1). The finding was typical of pituitary apoplexy. Cerebral infarction, intracranial aneurysm, or any other disease was not observed. The patient underwent endonasal transsphenoidal resection of the pituitary gland 14 days after the OPCAB. The resected tissue did not contain any tumor and only appeared necrotic. The patient exhibited excellent recovery with complete correction of the right ptosis and impaired light reflex and eye movement 40 days after the resection. Recurrence of the pituitary adenoma was not observed for two and a half years after the surgery.

2. Comments

Pituitary apoplexy is a rare but potentially life-threatening syndrome characterized by headache, ophthalmoplegia...
including visual loss, endocrine deficiency, altered mental status and even coma. The sudden onset of ischemia or hemorrhage in pituitary adenoma causes pituitary apoplexy, and the sudden expansion of the suprasellar tumor leads to compression of the surrounding important neurological structures, such as the optic tracts; chiasm; and cranial nerves II, III, IV, and V. Further, compression of these structures results in severe neurologic deficits. An emergent surgery is necessary when this syndrome results in worsening of consciousness and progression of symptoms, such as visual loss and endocrine deficiency.

Pituitary apoplexy usually occurs spontaneously, but it has also been reported as a complication after various medical treatments, including cardiac surgery [1, 2], abdominal aortic aneurysm surgery [3], anticoagulant therapy for unstable angina [4], coronary angiography [5], and even liposuction surgery [6] and joint arthroplasty [7]. Hemorrhage and ischemia in pituitary adenomas cause pituitary apoplexy. Excessive anticoagulation and high blood pressure can induce bleeding in pituitary adenoma. Low blood pressures can lead to ischemia and necrosis of the pituitary adenoma followed by bleeding. Cardiac surgery involves the following two major factors of pituitary apoplexy. Cardiopulmonary bypass (CPB) involves strong heparinization, and blood pressure during CPB is considerably lower than the normal levels. Almost all the patients reported in the literatures underwent cardiac surgery with CPB.

The strategy for patients with known pituitary adenoma who require coronary artery reconstruction remains controversial. Transsphenoidal adenoma resection should be performed before any kind of coronary revascularization if the patient’s condition is stable because of the high incidence of pituitary apoplexy around intervention. If the patient’s condition is unstable, OPCAB is considered to be better than the conventional CABG. Levy et al. reported four patients with known pituitary adenoma who required CABG [8]. Three of these patients exhibited pituitary apoplexy after CABG with CPB, but one of these who underwent one-vessel OPCAB did not exhibit any neurologic deficit after the surgery. They recommended OPCAB for patients with known pituitary adenoma who require CABG. In fact, the hemodynamic conditions during OPCAB are relatively more stable than those during CABG with CPB, and the extent of anticoagulation during the surgery is weaker in the case of OPCAB than in that of CABG with CPB. In our hospital, the ACT in the case of OPCAB is >250 s, whereas that in the case of CPB is >400 s. The initial dose of heparin used in the case of OPCAB performed in our hospital is 150 IU/kg, which is a half of the dose used for cardiac surgery with CABG.
CPB. The risk for bleeding and ischemia is thought to be lower after OPCAB than after cardiac surgery with CPB.

However, the present patient exhibited pituitary apoplexy even after OPCAB. In the present case, the initial ACT was 574 s, which was considerably longer than the standard ACT (250–350 s), and the excessive anticoagulation may have caused bleeding in the pituitary adenoma.

In conclusion, OPCAB also has a risk of pituitary apoplexy for patients with known pituitary adenoma who require coronary artery reconstruction surgery, even though OPCAB is considered to be safer than the conventional CABG.

References


