A 45-year-old woman developed acute massive pulmonary embolism two weeks after coronary artery bypass surgery. After confirmation of pulmonary embolism with echocardiography, the patient underwent pulmonary embolectomy within one hour of admission and a huge amount of clot was extracted via an incision of the pulmonary artery. The source of thrombus could not be determined. The patient was discharged uneventfully. At the three-month follow-up, there was no recurrence of pulmonary葡萄酒pression.

Key words: Coronary artery bypass/complications; echocardiography; embolectomy/methods; postoperative complications; pulmonary embolism/diagnosis/surgery.

Asymptomatic venous thromboembolism occurs after coronary artery bypass graft (CABG) operation at a surprisingly high frequency (15% to 20%) and the incidence of pulmonary embolism (PE) ranges from 0.5% to 4%. Massive PE is caused by the interaction of a large embolism with underlying cardiopulmonary disease, leading to hemodynamic instability. In the presence of shock, the mortality risk rises three- to sevenfold, the majority of deaths occurring within one hour of presentation. Echocardiography is very useful in the diagnosis, recognition, and differentiation of PE and in assessing its severity.

This report describes the use of emergency pulmonary embolectomy as an effective and aggressive therapeutic approach to a massive pulmonary embolism in a 45-year-old woman.

CASE REPORT

A 45-year-old, obese, and hypertensive woman complained of stable angina pectoris of two-month history. She underwent four-vessel CABG operation with the left internal mammary artery grafted to the left anterior descending artery, and separate saphenous vein grafts to two obtuse marginal branches and the right coronary artery. The surgery was uncomplicated. Aortic cross clamp time was 55 minutes and cardiopulmonary bypass time was 70 minutes. On the first postoperative day, she was transferred from the intensive care unit. Graded compressive stockings were applied together with three days of low-molecular weight heparin and daily 150 mg of aspirin and she was discharged on the sixth postoperative day.

One week later, the patient sought medical help because of sudden-onset respiratory distress and chest pain. On admission, she had cyanosis and cold sweating, her vital signs were borderline stable with the following: respiratory rate 32/min, heart rate 110/min, and blood pressure 80/40 mmHg. Electrocardiography showed sinus tachycardia with negative T waves in leads V1 to V4. Within 15 minutes of presentation, she was transferred to the echocardiography laboratory and transthoracic examination (TTE) revealed right ventricular dilatation, paradoxical movement of the ventricular septum, and grade 3 tricuspid regurgitation (Fig. 1). Because of progressive deterioration in the patient’s condition, we
decided to perform emergency pulmonary embolec-
tomy, and she was taken to the operating room in 60
minutes of admission.

 Shortly after induction of anesthesia and when the
patient was already intubated, systemic blood pressure
fell to 50/30 mmHg so an intravenous bolus injection of
0.5 mg adrenaline was administered. The sternum was
opened, transesophageal echocardiography (TEE) probe
was inserted and the diagnosis of PE was confirmed.
To prevent further deterioration to cardiac arrest, the
patient was heparinized and placed on cardiopulmonary
bypass (CPB) using aortic and bicaval right atrial can-
nulation. The procedure was performed without aortic
cross-clamping. Under normothermic conditions, a lon-
gitudinal arteriotomy was made in the main pulmonary
artery extending to the bifurcation and, with the use of
a malleable clamp and vacuum aspirator, a huge amount
of clot was gently extracted in several pieces (Fig. 2).
Intraoperative TEE showed no remnants of thrombus
either in the right atrium or right ventricle. Weaning
from the heart-lung machine was successful in the first
attempt with only moderate inotropic support. Total
CPB time was 45 minutes.

The postoperative course was uneventful. Follow-up
TEE showed normal right ventricle contractility and no
emboli. The patient was extubated on the following day.
Venous sonography did not show any thrombus in the
leg veins. The patient was discharged on warfarin and
aspirin on the eighth day. At the 3-month follow-up visit,
there was no recurrence of deep vein thrombosis and no
signs of pulmonary hypertension.

DISCUSSION

Current thromboprophylaxis approaches after CABG
surgery are mostly based on passive and active mobi-
lization, compressive stockings, the use of antiplatelet
therapy, and subcutaneous heparin in selected cases.
Nevertheless, the incidence of asymptomatic deep vein
thrombosis is fairly high. The incidences of deep vein
thrombosis and PE following CABG operation range
from 17% to 22% and from 0.6% to 0.8%, respectively.[3]
Moreover, clots are often encountered in the leg from
which the saphenous vein was not harvested.[5] Massive
PE exceeding 50% pulmonary artery obstruction pro-
duce hemodynamic instability and, with the develop-
ment of shock, the mortality risk rises several-fold, the
majority of deaths occurring within one hour of presen-
tation.[2] Hence, early diagnosis and urgent treatment is
lifesaving. Elicitation of historical information, physical
examination findings, and laboratory data is of great
importance. Echocardiography is very useful in the
diagnosis, recognition, and differentiation of PE and in
assessing its severity.[3] Transesophageal echocardiogra-
phy is superior in detecting extrapulmonary thrombi in
localizations such as the inferior vena cava, right atrium
and right ventricle.[6] Recent advances in spiral CT have
enabled direct visualization of PE within the pulmonary
arteries and dilatation of the right ventricle, but it was
not possible to perform CT in our case because of rapid
deterioration of the patient’s condition.

Thrombolytic treatment is often effective, but the
extent of the clinical benefit remains unclear. According
to a report by the International Cooperative Pulmonary
Embolism Registry, the rates of recurrent PE in 90 days
and related mortality do not decrease in patients treated
with thrombolytic therapy.[7] An earlier report of the
same registry found the incidence of intracranial bleed-
ing as 3% following thrombolytic therapy.[8]

In the past, high operative mortality rate was the
major drawback of surgical pulmonary embolectomy.
However, recent reports by many centers recommended
pulmonary embolectomy as a safe and effective alterna-
tive to thrombolysis or catheter thrombectomy.[9,10]

Insertion of a vena caval filter is a common clinical
practice for prophylaxis,[11] but it was not available in
our case.
As the development of cardiac arrest before surgical intervention is the most frightening condition,[3] early decision making about surgical strategy is the cornerstone for the success of the procedure. Our patient was operated on within the first hour of admission.

In conclusion, a successful outcome after emergency pulmonary embolectomy necessitates urgent initiation of the operation before cardiac arrest develops and TTE or TEE are very useful for rapid diagnosis.

REFERENCES