Ruptured thoracic descending aortic aneurysm coexisting with DeBakey type IIIb aortic dissection

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Abstract  We have encountered a rare case of ruptured true thoracic aortic aneurysm coexisting with DeBakey type IIIb aortic dissection. The patient was a 67-year-old woman who had a past history of hypertension and cerebral infarction. She experienced DeBakey type IIIb acute aortic dissection, and initially conservative medical treatment was carried out. However, the patient suddenly went into shock, and emergency contrast-enhanced computed tomography revealed the presence of a ruptured true thoracic aortic aneurysm coexisting with the type IIIb dissection. Replacement of the descending aorta was performed through a left thoracotomy using circulatory arrest and deep hypothermia. The rupture site and intimal tear were located in the middle of the aneurysm. Open proximal and distal anastomoses were carried out using a 22 × 10 mm gelatin-covered Dacron graft. The patient was discharged from our hospital uneventfully on the 33rd postoperative day.

Key words  Ruptured true thoracic aortic aneurysm · DeBakey type IIIb aortic dissection · Graft replacement · Circulatory arrest · Deep hypothermia cardiopulmonary bypass

Introduction

Atherosclerotic aortic aneurysms rarely coexist with aortic dissections. Furthermore, rupture of an aortic aneurysm is known to be associated with a markedly poor prognosis.1,2 We report here an unusual case in which a patient with both a dissecting aneurysm and a ruptured thoracic descending aortic aneurysm survived surgical graft replacement under deep hypothermic circulatory arrest.

Case

A 67-year-old woman who had a past history of hypertension and cerebral infarction visited a local clinic with a complaint of acute abdominal pain. Abdominal computed tomography (CT) revealed findings suspicious of a dissection extending from the thoracic descending aorta to the abdominal aorta. She was admitted to the hospital for conservative therapy. On the next morning, sudden chest and back pain developed; and the patient went into shock with a systolic blood pressure of <80 mmHg. Rupture of a thoracic descending aortic aneurysm coexisting with the DeBakey type IIIb acute aortic dissection was diagnosed by emergency contrast chest and abdominal CT, and the patient was transferred to our hospital as an emergency case.

The patient was fully conscious and complained of persistent left back pain. Physical examination revealed the following: blood pressure 116/66 mmHg; pulse 133 beats/min and irregular; no murmurs on cardiac auscultation; left lung respiratory sounds attenuated. The hemoglobin level was 12.6 g/dl, indicating the absence of significant anemia. Except for renal dysfunction, as evi-
enced by a serum creatinine level of 1.58 mg/dl, a bio-
chemistry profile revealed no abnormalities.

A true aneurysm with a maximum diameter of 60 mm
was observed at the level of the thoracic descending
aorta, and the presence of a hematoma was recognized
in the left pleural cavity (Fig. 1). The complicating aortic
dissection showed a patent false lumen that had de-
veloped from the distal end of the descending aorta to
the left common iliac artery; but the celiac artery, superi-
or mesenteric artery, and both right and left renal arteries
branched off from the true lumen.

The patient was placed in the right semilateral posi-
tion. After partial extracorporeal circulation was insti-
tuted with left femoral arterial perfusion and left femoral
vein drainage, cooling was initiated. A left posterolateral
incision and thoracotomy was made at the fifth intercos-
tal space, and a hematoma, which had perforated into
the pleural cavity, was observed. Extracorporeal circula-
tion was suspended when the blood irrigation tempera-
ture reached 17.2°C and urinary bladder temperature
was at 20°C; deep hypothermic circulatory arrest was
then established. The aortic perforation was observed to
be located on the mediastinal side of the site where the
aneurysm had the largest diameter, and the dissection
reached to the perforated site. Moreover, an additional
transverse intimal tear 10 mm in length was observed
within the aneurysm on the opposite side (Fig. 2).

The proximal side of the aorta was anastomosed at a
site deemed to be sufficiently distant from the left sub-
clavian artery by the open proximal method with a gel-
atin-sealed woven polyester graft (Gelweave) measuring
22 × 10 mm. After anastomosis of the proximal side,
extracorporeal circulation to the upper body was reiniti-
ated by returning blood through a side branch of the
graft, and the distal anastomosis was completed. The
graft replacement was performed from the seventh to
ten-th level of the thoracic vertebrae with no reconstruc-
tion of the intercostal arteries. The period of total circu-
latory arrest was 29 min. Because the distal aortic walls
were fragile due to the dissection, they were reinforced
with Teflon felt. Extracorporeal circulation was termi-
nated without a problem after 2 h 42 min.

Fig. 1 Thoracic and abdominal aortic computed tomography. a
Aortic dissection was not observed at the proximal thoracic
descending aorta. b True thoracic descending aortic aneurysm
with a maximum diameter of 60 mm and intrapleural hemorrhage.
c, d DeBakey type IIIb aortic dissection at the distal end of the
aortic aneurysm