Aortocaval Fistula Complicated with Bacteremia Due to Escherichia coli: Report of a Case

Hiroyuki Inoguchi1, Shinsuke Mi1, Hiroyuki Orita1, Hisanobu Sakata2, and Yasuro Kaiduka3

1Department of Surgery and Science, Graduate School of Medical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan
Departments of 2Surgery and 3ICU, Nippon Steel Yawata Memorial Hospital, 1-1-1 Harunomachi, Yahatahigashi-ku, Kitakyushu 805-8508, Japan

Abstract
We herein report a case of aortocaval fistula complicated with bacteremia due to Escherichia coli in a 78-year-old man who underwent an emergency operation. A surgical resection of the abdominal aortic aneurysm with a closure of the fistula, and reconstruction with an expanded polytetrafluoroethylene bifurcated graft and wrapping with an omental flap, were performed followed by a 9-week continuous administration of antibiotics. Thereafter, antifungal agents were administered and the results were good. Both an early diagnosis and prompt surgery are important for such patients, and long-term administration of antibacterial agents is also necessary.

Key words Aortocaval fistula · Abdominal aortic aneurysm · Bacteremia · Escherichia coli

Introduction
Aortocaval fistula (ACF) was described for the first time in 1831 by Syme, and a similar case was treated successfully in 1954 by Cooley. Since then it has become a well-recognized but uncommon complication of an abdominal aortic aneurysm (AAA) with the incidence from 0.2% to 2.2% of all AAA and from 3.0% to 6.0% of ruptured AAA.1-7 The overall mortality rate ranges from 21% to 61% and, if not surgically treated, the estimated survival does not exceed 2 months at most, while the mean survival after onset is 20 days.1,5-7 The factors influencing the mortality rate include preoperative shock, the diameter of the fistula, a coexistent retroperitoneal rupture, the degree of atherosclerotic heart disease, and a delay in diagnosis.1,4,5,7 The presence of bacteremia is also considered to lead to a poor outcome.

We herein report a rare case of ACF in a patient with bacteremia due to Escherichia coli, who was successfully treated.

Case Report
A 78-year-old man was transferred from another hospital for the evaluation and treatment of hematuria of 5 days' duration, renal dysfunction, and AAA on May 19, 1999. His medical history was only significant for severe silicosis. Chest plain X-ray and computed tomography (CT) scans demonstrated a reticular shadow over the lung fields on either side, mediastinal lymph node calcification (egg shell), and encapsulated fluid at the left hemithorax. A physical examination on admission showed a body temperature of 36.5°C and a blood pressure of 110/48 mmHg. The right thigh and leg were both swollen, and a pulsatile abdominal mass was palpated with bruit. Symptoms of lumbago, which appeared 9 days before admission, had disappeared at presentation. The laboratory data showed leukocytosis (14 300/µl) and renal dysfunction (blood urea nitrogen 59.0mg/dl, creatinine 1.6 mg/dl). Enhanced CT scans demonstrated a large aneurysm in the infrarenal abdominal aorta, measuring 8.2 cm in diameter, with a simultaneous enhancement of the inferior vena cava and no extravasation of contrast, which thus led to a diagnosis of aortocaval fistula (Fig. 2).

The patient underwent a surgical operation on the 16th day after admission despite the presence of...
bacteremia and severe respiratory dysfunction. During laparotomy, a huge fusiform aneurysm, measuring 9 cm in diameter, with bruit on the right wall was identified. After clamping the aorta, the AAA was opened and venous bleeding from the fistula, which measured 2 cm in diameter, was controlled by compressing the vena cava with sponge sticks and thereafter the fistula was closed using 3-0 interrupted horizontal mattress sutures with pledgets. The aorta was reconstructed using a 20 × 10-mm expanded polytetrafluoroethylene (ePTFE) bifurcated graft and the right internal iliac artery was also reconstructed using the same 10-mm graft. The wall, which showed aneurysmal tendencies, was resected and irrigation using 5000 ml saline was done. The graft was covered with an omental flap. An intraoperative blood culture was positive for *E. coli* whereas cultures of thrombus and the aneurysmal wall were negative. A histological examination of the aneurysm wall showed severe atherosclerotic changes with no acute inflammation or bacterial growth (Gram stain). The estimated blood loss was about 7000 g and no significant change in the vital signs was recognized intraoperatively.

The patient had a hemodynamically stable postoperative course. Respiration was controlled with the combination of synchronized intermittent mandatory ventilation (SIMV) and pressure support (PS) or bi-level positive airway pressure (BiPAP), and complete weaning was achieved on the 70th postoperative day (POD). A blood culture on POD 4 was negative but on POD 11 it was positive for *Candida albicans*. Intravenous antibacterial agents were administered for 38 days followed by 4 weeks of oral antibiotics, and the infectious symptoms, such as a febrile state or leukocytosis, gradually improved. A blood culture was negative on POD 31. Enteral alimentation instead of intravenous hyperalimentation (IVH) through a gastrostomy on POD 39 was administered to improve the patient’s weak bowel function and poor alimentary state. The patient finally recovered well from ACF, respiratory dysfunction, and bacteremia, and was thereafter transferred to a general hospital in his home town.

**Fig. 1.** Enhanced computed tomography scans demonstrated a huge infrarenal abdominal aneurysm, measuring 8.2 cm in diameter (a). The inferior vena cava was also simultaneously enhanced (b, arrowhead).

**Fig. 2.** An arteriogram on hospital day 15 visualized the presence of an abdominal aortic aneurysm with a simultaneous opacification of the vena cava with no extravasation of contrast material. As a result, an aortocaval fistula was diagnosed.