**Case Report**

**Asymptomatic Spontaneous Rupture of a Nonaneurismal Visceral Aorta**

Masaki Yada, MD, PhD, Yasumi Maze, MD, PhD, Toshiya Tokui, MD, PhD, and Sekira Shomura, MD, PhD

Spontaneous nonaneurysmal rupture of the aorta is a life-threatening condition for which emergency diagnostic and therapeutic measures are indicated. An asymptomatic spontaneous aortic rupture was unexpectedly discovered adjacent to the visceral aorta. We diagnosed the mass as a pseudoaneurysm, and surgery was performed. This was the first reported case of asymptomatic spontaneous rupture of a nonaneurysmal visceral aorta. (Ann Thorac Cardiovasc Surg 2008; 14: 336–338)

Key words: asymptomatic spontaneous rupture, nonaneurysmal visceral aorta, penetrating atherosclerotic ulcer

Introduction

Spontaneous rupture of the abdominal aorta is a rare event. In all cases, patients suffer from severe pain, including chest, abdominal, and back pain. In this case, the patient had no symptoms from the spontaneous rupture of a nonaneurysmal visceral aorta.

Case Report

A 74-year-old man was referred from medicine to our department concerning a mass adjacent to the visceral aorta. The patient had general fatigue and several months earlier a weight loss. He took an ultrasonography that showed a mass near the abdominal aorta and pancreas. At first a physician suspected the mass to be a pancreas carcinoma. A computed tomography (CT) scan was done immediately, indicating that there was no tumor in the pancreas. However, a mass was recognized on the visceral aorta. Magnetic resonance imaging (MRI) (Fig. 1) was done at the same time, and the shape of the mass was found to be an infectious aortic aneurysm.

The patient came to our department on foot. General fatigue had already disappeared. He had been enjoying good health until then, had no history of hypertension, and had taken no medication. There was no pain, no history of trauma, and no fever. He was admitted to our hospital for the observance of a mass. At that point, we couldn't figure out the relation to the mass and general fatigue or weight loss of which the patient had complained several months earlier. On admission, his blood pressure, body temperature, and white blood cell count were 110/70 mm Hg, 36.5°C, and 2.9 \times 10^9/L, respectively. He had no symptoms at the abdomen, neither palpable nor pulsatile mass. Mild anemia existed, with a hematocrit value of 25.4%. Recently, he had pointed out mild renal failure; the creatinine level was 3.6 mg/dl. After a few days, a repeat CT scan suggested an increasing size of the mass; therefore we strongly suspected that the mass was a pseudoaneurysm. There was no sign of aortic dissection or aneurysm. The pseudoaneurysm existed just above the level of the celiac axis.

With the high risk of pseudoaneurysm rupture, surgical treatment was the only hope to save this patient. The surgical treatment was performed. There were no aneurysmal changes or dissection at the aorta. The normal size of the aorta was isolated at the proximal and distal sites of the pseudoaneurysm, which was recognized just above the celiac axis (Fig. 2). There was no pus in the pseudoaneurysmal sac, and no infectious change was recognized. After opening the visceral aorta longitudi-
nally, we found a lack of aortic wall at the right anterior aspect of the visceral aorta. The large pseudoaneurysm was confined to the retroperitoneal space without thrombus. Mild atherosclerotic change was found around the area of perforation. However, there was no evidence of aortic dissection or aortic aneurysm. The aortic wall was resected and replaced with an 18 mm woven Dacron graft. On day 4 after the operation, the patient suffered acute respiratory failure, which resulted in disseminated intravascular coagulation (DIC) and multiple organ failure (MOF). The patient died on day 16.

A pathological examination of the resected specimen revealed an atherosclerotic change with calcification and fibrous thickening of the intima. However, there was no evidence of dissection, cystic medial necrosis, or hematoma in the media. Also, we found no signs of inflammation or bacterial invasion.

Discussion

Not associated with aortic aneurysm, dissection, trauma, medically induced, inflammation or infection of the aortic wall, erosion from a neoplastic mass or secondary to surgery, spontaneous aortic ruptures are very rare events, but fatal. To our knowledge, 17 cases of spontaneous abdominal aortic rupture have been reported in the English literature. Moreover, this is the third reported case of a spontaneous contained rupture of the visceral aorta.\(^1\,2\) All of the patients came to the hospital because of pain, including chest, flank, back, and abdominal pain. Some cases were sudden onsets, and some were chronic.\(^3\) Moreover, complaints varied widely and included nausea and vomiting; the most serious situation was shock. Does and Brouwer\(^4\) reported painless spontaneous rupture in their literature, but the patient had mild abdominal discomfort and pulsatile abdominal swelling. In our case, the patient did not complain when he was admitted. A preoperative CT scan and an MRI showed a suspected infectious aortic aneurysm, but there were no signs of infection in the preoperative physical examination. To make a preoperative diagnosis in the usual cases of spontaneous aortic rupture is complicated.\(^5\) The asymptomatic spontaneous rupture that we experienced was more difficult to diagnose preoperatively. Ashcraft et al.\(^6\) concluded in his report that a diagnosis of spontaneous aortic rupture was often delayed. Lastly, we decided to operate because the size of the mass surrounding the aorta was increasing, as seen in the secondary CT scan. We diagnosed the mass as a pseudoaneurysm, and then we considered the risk of a rupture.

Fig. 1. A sagittal section of magnetic resonance imaging (MRI) shows the mass continuing from the visceral aorta (arrows).

Fig. 2. A pseudoaneurysm was recognized just above the celiac axis. The normal size of the visceral aorta was found.
The precise mechanism of spontaneous rupture is not well known. The leading pathological findings from the spontaneous aortic rupture were atherosclerotic change with longstanding hypertension. Some reports indicated that a calcification of the aorta might play an important role in perforation. Our case had atherosclerotic change and calcification of the aorta in the pathological examination, but no history of hypertension.

Recently, Stanson et al. reported as a new clinical entity that penetrating atherosclerotic ulcers (PAUs) could be regarded as a cause of aortic rupture. A PAU of the aorta is an ulceration of an atherosclerotic plaque that penetrates the intima. It results in aortic intramural hematoma, adventitial pseudoaneurysm formation, or aortic rupture. Nora and Hollier suggest that a PAU may be an initial form of perforation. Braverman reported that PAU might lead to aortic complications, including aortic rupture or pseudoaneurysm formation. Almost all reports about PAUs indicate that they are usually accompanied by pain, but the mechanism of pain is obscure. In our asymptomatic case, the result of the pathological examination showed that a thickening of the intima and atherosclerotic change were found. So we considered that in this case the perforation might have been caused by a PAU.

In summary, a case of a 74-year-old man with spontaneous rupture of a nonaneurismal visceral aorta is described. The asymptomatic case was very rare and difficult to diagnose. We conclude that PAU might be an important cause of a spontaneous aortic rupture.

Acknowledgments

We thank Ms. B. Tishkoff for critically reading the manuscript.

References