SHORT REPORT

Rupture of the Abdominal Aorta by an Atherosclerotic Plaque with Associated Aortoduodenal Fistula

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We report a case of rupture of a nonaneurysmal infrarenal aorta secondary to severe atherosclerosis and salmonella infection with formation of an aorto-duodenal fistula. A review of the cases of non-aneurysmal aortic rupture and Salmonella aortitis reported in the English literature revealed no case with an associated aortoenteric fistula, which in our patient conditioned the outcome.

Case Report

A 70-year-old woman with a history of diabetes mellitus and cholecystectomy was transferred to the emergency department for hematemesis. She had experienced for the previous month abdominal discomfort without history of diarrhoea. Computed tomography showed an infrarenal aorta of normal size (2.2 cm) with severe calcification affecting 75% of the aortic circumference and a gap in the atheroma plaque at the posterior side (Fig. 1). A hematoma was found surrounding the aorta and closely associated to the distal third of the duodenum (Fig. 2). A duodenoscopy showed protrusion in the distal third of the duodenum of an ulcerated pulsatile mass. At surgery, there was no evidence of local infection. An orifice of 20 mm was seen in the posterior side of the aorta. An aortobiliac Dacron graft was positioned. The retroperitoneum was closed leaving a pediculated flap of greater omentum. Culture of the aortic thrombus and wall proved positive for group D Salmonella, which was also isolated in feces. Blood cultures were negative. Two weeks later she experienced sudden pain in the left flank region. A scanner showed the presence of a large periaortic hematoma. At surgery, a bleeding point at the proximal anastomosis was found and sutured. Culture of the hematoma proved positive for coagulase-negative Staphylococcus and Candida albicans. The patient was discharged one month after the first operation with negative blood cultures and specific antibiotic treatment. Three days later the patient returned to the emergency department in shock. Emergency surgery revealed heavy bleeding through the proximal anastomosis, and the patient died in the operating room as a consequence of hemorrhagic shock. Culture of the prosthesis was negative for Salmonella.

Discussion

Non-aneurysmal rupture of the aorta is extremely rare, and few cases have been reported in the literature. Copping,1 in an autopsy study of 151 cadavers with abdominal aortic rupture, reported only two cases of non-aneurysmal rupture. In most cases, where no cause has been found, the condition has been related to severe aortic atherosclerosis with either rupture of a penetrating atherosclerotic ulcer2 or extensive calcification with atrophy of the aortic layers.1,3

Salmonella is the microorganism more frequently reported as the causative agent of aortitis. Salmonella seems to have a predilection for atherosclerotic vessels, and almost all instances is associated with an aortic aneurysm.1 The infective process progresses to
destruction of the intima and media and usually undergoes aneurysmal dilatation, but in severely calcified aorta the infection can lead to rupture without aneurysmal dilatation.\textsuperscript{5}

The presence of a primary aortoduodenal fistula associated to a non-aneurysmal aorta is equally rare. Cases have been reported associated with aortic dissection,\textsuperscript{6} neoplasms or infected aneurysms. However, it is difficult to establish whether an aneurysm is colonized through the fistula, or is the result of primary aortitis.\textsuperscript{7}

Resection of the aorta and reconstruction is the treatment. Extraanatomic bypass is associated with the least postoperative rate of infection, but good results have been reported with a direct graft interposition.\textsuperscript{4} In aortoduodenal fistulas with no evidence of aortitis, bacterial invasion is usually limited to the area of the fistula, and extra-anatomical revascularization does not seem to be initially warranted.\textsuperscript{7}

We suspect that a contained aortic rupture through an atherosclerotic plaque occurred first. Anyway, we keep in mind the possibility of a asymptomatic \textit{Salmonella} infection developed an aortitis in a severely calcified aorta and helped to the rupture. The resulting hematoma caused duodenal perforation leading to colonization of the aorta. In patients who present abdominal pain, a computed tomography study in which severe aortic calcification is seen, should at least alert us to the need for closely monitoring the patient. Although the natural history of aortic rupture due to atherosclerosis is not known, it should be taken into account that these lesions can evolve towards aortic rupture, mainly if a \textit{Salmonella} infection is associated.

\textbf{References}


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