Abdominal aortic aneurysm following acute pancreatitis



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Vascular lesions may complicate the course of acute pancreatitis. The activated pancreatic enzymes, particularly elastase, might cause lysis of the elastic component of the arterial wall thus leading to aneurysmal changes. This report is on a case of aneurysm of the infrarenal aorta following complicated acute pancreatitis and treated by endovascular technique.

KEY WORDS: Acute pancreatitis, Aortic aneurysm, Endovascular surgery.

Introduction

Arterial dilatation is not an uncommon complication of acute pancreatitis ^{1,2}. The enzyme-rich peripancreatic fluid, often within a pseudocyst, may lead to autodigestion and weakening of the wall of adjacent arteries with ensuing aneurysmal dilatation. The dilated area is correctly termed an "aneurysm" since blood is still contained within the complete, although tinned, arterial wall.

Aneurysmal changes often arise in pancreatic arteries or in the splenic artery, which is the most frequent site. The involvement of the aorta was documented in literature only twice $^{3, 4}$.

This paper deals with a case of aneurysm of the infrarenal aorta, arising after complicated acute pancreatitis and treated by endovascular technique.

Case report

MDC, a 63 years-old man, was admitted to the hospital with a diagnosis of drug-induced (Lisinopril and Idroclorothiazyde) acute pancreatitis (Ranson score 3; Glasgow score 3). In the past the patient underwent Hartmann's procedure for colonic diverticular disease and transabdominal prostatectomy. CT scan confirmed the diagnosis, showing a fluid collection in the retroperitoneum, along the mesenteric root (Balthazar score 6). Conservative medical treatment and TPN were undertaken. On the third week, fever occurred with septic course. Blood coltures showed a Candida Albicans infection. The fluid collection was drained out percutaneusly by means of ultrasounds guidance, slowly reducing in volume. Candida Albicans was also present in this fluid. Anti-fungal therapy was started leading to disappearance of the septic status.

One month later, a small subdiaphragmatic collection arose, with limited cutaneous inflammation followed by a sinus tract and a slow progressive spontaneous recovery. One year later the onset of acute pancreatitis, a CT scan detected a saccular aneurysm of the infrarenal aor-

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Fig. 1: Angiography showing infrarenal aneurysm.

ta measuring 1 cm in diameter. Imaging was completed by spiral CT scan and digital angiography (Fig. 1). Endovascular treatment was performed using a straight aortic endograft (Endologix). Under general anaesthesia the right femoral artery was surgically prepared and then approached according to Seldinger, using Amplatz Super Stiff 035 guide.

A 4 fr. pigtail catheter was placed trough the right brachial artery and driven near the renal arteries to constantly monitor the procedure. After general heparinization, the Endologix aortic endograft was introduced via the common femoral artery trough a 18 fr. device. Completion angiography was carried out to check the correct position and patency of the endograft and the absence of endoleaks (Fig. 2).

General conditions of the patients were excellent and all peripheral pulses were present. The patient was discharged on the 3^{rd} postoperative day. The CT scan follow-up at 30, 90 and 120 days confirmed good patency of the graft and complete exclusion of the aneurysm. After two years, the patient is in good health.

Discussion

Vascular lesions frequently complicate the course of acute pancreatitis. Severe inflammation, regional necrosis and infection may cause major vessel erosion with or without aneurysmal dilatation which may result in severe gastrointestinal bleeding o in peritoneum or in retroperitoneum. The mechanism of vascular injury during acute pancreatitis is based on the release of activated proteolytic pancreatic enzymes (elastase) which might cause lysis of the elastic component of the vessel wall followed by erosion and disruption. Under other circumstances



Fig. 2: Angiography following endovascular procedure.

this autodigestion might weaken the vessel wall sufficiently enough to allow the occurrence of aneurismal changes. The term aneurysm can be correctly used when blood is still contained within the thinned but complete arterial wall. Rupture of the aneurysm into a pseudocyst will convert the pseudocyst into a pseudoaneurysm, an extravascular hematoma communicating with the intravascular space.

The prevalence of aneurysm in course of acute pancreatitis is difficult to assess. In literature it ranges from 7 to $31\%^{-1, 2}$. Peripancreatic arteries are the most frequently involved, including the splenic artery (60%), the hepatic (20%), the superior mesenteric (5.5%), the left gastric and gastroepiploic (4%), the inferior mesenteric (3%) and the pancreaticoduodenal (1.5%) arteries. Involvement of the aorta was documented only in two cases both pseudoaneurysms of the infrarenal aorta, one resulting from a gallstones pancreatitis ³ and the second from a chronic alcoholic pancreatitis ⁴. In some cases extrapancreatic fluid collections might dissect the wall of abdominal aorta during acute pancreatitis but no cases of aneurysm formation was recorded ⁵.

The peculiarity of our case lays in the diagnosis of a "true" aneurysm of the infrarenal aorta following an episode of complicated acute pancreatitis, without the formation of pseudocyst.

It is almost impossible to suggest an univocal hypothesis concerning the development of this complication. It seems very likely, however, that a key role was played on the one hand by the proteolytic activity of pancreatic enzymes, particularly elastase, on the aortic wall and on the other hand by the inflammatory and infectious processes (Candida Albicans may lead to saccular aneurysmal dilatation). The relationship between inflammatory infiltrates and the development of experimental aortic aneurysms has been studied ^{6, 7}. It should be emphasized, however, that in this patient CT scanning performed during the course of acute pancreatitis never suggested the involvement of the aortic wall, i.e. an increase of the contrast enhancement and thickness of the vessel wall. Topic for discussion should be the uncommon diagnosis of aortic aneurysm following acute pancreatitis, with Candida Albicans complicating the course of the disease. Late follow-up including CT scan and digital angiography should be suggested.

The choice of surgical repair of the aneurysm is another feature of this case. A careful assessment of local conditions (the patient underwent different abdominal surgical procedures), the previous pancreatic lesion and the anatomic pattern of the aneurysm suggested the endovascular way by using endograft. The surgical treatment could have risen several controversies: a) the use of prosthetic material in a patient with previous severe infection, long-term administration of antibiotics and low immunitary profile; b) the persistence of a sinus at the time of endograft implantation with further increase of the risk of infection; c) patient's general conditions showing incomplete recovery of body weight and, presumably, tissue plasticity; d) local anatomic conditions consistently changed by both previous surgical and radiologic procedures and intense inflammatory reaction; e) the possibility of adhesions which was to be expected. The choice of the endovascular technique appeared as the most suitable option for the patient, according to his general and local conditions and to the risk of rupture of the aneurysm. The transfemoral approach in fact minimizes surgical trauma, reduces the risk of infection, avoids damages to immunity and shortens the time for anaesthesia.

Riassunto

Le lesioni vascolari possono complicare il decorso di una pancreatite acuta. Gli enzimi pancreatici attivati, in particolare l'elastasi, potrebbero causare la lisi della componente elastica della parete arteriosa e determinare, pertanto, la dilatazione aneurismatica.

Il presente lavoro riporta un caso di aneurisma dell'aorta sottorenale trattato con tecnica endovascolare, in un paziente con pregressa pancreatite acuta complicata.

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