INFLAMMATORY ABDOMINAL AORTIC ANEURYSM – A FORM OF CHRONIC PERIAORTITIS

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INFLAMMATORY ABDOMINAL AORTIC ANEURYSM - A FORM OF CHRONIC PERIAORTITIS (Abstract). Chronic periaortitis represents a unique pathogenic concept for three entities: Inflammatory Abdominal Aortic Aneurysm, Idiopathic Retroperitoneal Fibrosis and Perianeurysmal Retroperitoneal Fibrosis. The fundamental meaning of an inflammatory reaction to advanced atherosclerosis has been developed on the bottom of clinical and histological features. The triad of abdominal pain, weight loss and elevated inflammatory markers: erythrocyte sedimentation rate/C-reactive protein in patients with abdominal aortic aneurysms revealed on contrast-enhanced computer tomography is highly suggestive for inflammatory aneurysm. We report a case of a heavy-smoker adult male presented with suddenly abdominal symptoms suggestive for mesenteric ischemia which have proved to be due to inflammatory abdominal aortic aneurysm. The most favorable management of patients with inflammatory aneurysm is ambiguous. Surgical approach seems reasonable even supposing inflammatory aneurysm emerges less likely to rupture than the atherosclerotic variant. Corticosteroids are used in inoperable inflammatory aneurysm, even if is well known that this treatment does not change the long-term outcome of the disease. Surgical-open or Endovascular Repair of the aneurysm is the elective treatment. Key words: INFLAMMATORY ABDOMINAL AORTIC ANEURYSM, CHRONIC PERIAORTITIS, RETROPERITONEAL FIBROSIS.

Inflammatory abdominal aortic aneurysm (IAA) represents 10 % of all cases of abdominal aortic aneurysm (1) and is a form of chronic periaortitis (CP) which includes idiopathic retroperitoneal fibrosis and perianeurysmal retroperitoneal fibrosis (2, 3). Unlike atherosclerotic aortic aneurysm, the inflammatory type is characterized by remarkable thickening of the aneurysm wall and fibrosis of the adjacent retroperitoneum (4). The classical presentation consists in the triad of abdominal/back pain weight loss and raised inflammatory markers (2, 5, 6). It is important to recognize inflammatory abdominal aortic aneurysm in order to prevent the severe compli-
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cations and the potentially fatal course (2, 6). Contrast-enhanced computed tomography and magnetic resonance imaging (MRI) is a reliable diagnostic modality (7, 8, 9). Knowing the features of inflammatory abdominal aortic aneurysm would allow doctors to distinguish it from atherosclerotic aneurysm and to treat it with the suitable combination of surgical and medical therapies (6, 10).

CASE REPORT

A 61-year-old man, presented with a short history of one week of recurrent diffuse abdominal pain, nausea and vomiting. In the last 24 hours the symptoms got worsened, the abdominal pain increased and localized in the left lower quadrant and low-grade fever appeared. The patient is a heavy smoker, overweight, known with dyslipidemia and has a family history of myocardial infarction, and stroke. In the last two months the patient have had a dull intermittent low back pain which worsen at night and weight loss of 3 kg. He denied intestinal transit alteration or presence of blood in stools.

Clinical examination in the emergency room showed an obese patient with bilateral xanthelasma, abdominal distension, and important pain on palpation on left iliac fossa with no rebound tenderness accompanied by discomfort with palpation in the whole left lower quadrant. Blood pressure 180/110mmHg, heart rate 89/min with extrasystoles.

Investigations showed raised C-reactive protein (CRP) 33 mg/dl and erythrocyte sedimentation rate (ESR) 65 mm/h, mild leukocytosis 12200/mm³, lactate dehydrogenase (LDH) and creatine kinase MB (CK-MB) slightly increased, low-density lipoprotein cholesterol (LDL-cholesterol) 150 mg/dl, urinalysis were in normal range. Plain abdominal x-ray showed few hydroaeric levels without pneumoperitoneum; abdominal ultrasound revealed aortic dilatation suggestive of abdominal aneurysmal aortic appearance with 40 mm diameter. Chest X-ray was normal. Abdominal computed tomography revealed the presence of a 5 cm aneurysm of the infrarenal abdominal aorta on a length of 7 cm and aneurismal dilatation of both common iliac arteries and also, a soft-tissue density mass enveloping the aorta from the renal arteries down to the aortic bifurcation, that caused left mild hydronephrosis and dilatation of the ipsilateral ureter; the left kidney appeared enlarged, with important densification of perirenal fat extended up to the ureter (fig. 1).

Fig. 1. Abdominal computed tomography
These appearances were consistent with inflammatory abdominal aortic aneurysm, in agreement with cardiologist and vascular surgeon, we decided to perform an angiography which confirmed aneurismal aortic dilatation, normal mesenteric and renal arteries. Additional investigation showed atherosclerotic lesions in the carotid artery, mitral regurgitation and aortic valve stenosis. Serologic testing for autoimmune diseases was negative.

During hospitalization the clinical picture worsened with the appearance of signs suggestive for mesenteric ischemia: intense abdominal distension with ileus, important abdominal pain with vomiting and peritoneal irritation, hemodynamic instability. The medical team (composed of Internal Medicine Specialist and Vascular Surgeon) consultation considered appropriate the surgical treatment for the inflammatory abdominal aortic aneurysm. Transperitoneal standard median open laparotomy was performed, the aneurysmal segment was replaced with an appropriately sized Dacron tube graft and an aorto-bifemoral bypass operation was performed by using another Dacron tube graft. The retroperitoneal fibrosis involved the ureters therefore ureteral dissection was necessary. Intraoperative diagnosis of inflammatory aneurysm was based on the characteristic appearance of an aorta encased in a thick white fibrotic tissue. Specimens were obtained and were sent to the laboratory for histological examination.

The main finding was fibrosis of the adventitia with dense chronic inflammatory infiltrates with lymphoid follicle formation, presence of lymphocyte and other plasma cell proliferation.

As a result of the extensive retroperitoneal fibrosis technical difficulties with increasing bleeding appeared, thus patient had to be transfused in the postoperative period. Postoperative outcome has been favorable.

The first control visit was performed at one month after the operation. Patient underwent clinical examination by vascular surgeons and computer tomography examination at 6 months after the operation and annually thereafter.

One-year follow-up of the outcome contrast-enhanced abdominal computer tomography reveals functional aortic bifemoral prosthesis; mild delay in opacification of both iliac arteries which appear dilated and tortuous. Periaortitis fibrosis tissular mass is diminished compared to previous examination. The kidneys have normal dimensions with regular excretion; there is no hydronephrosis (fig. 2).

Fig. 2. Abdominal computed tomography at one year follow-up
DISSCUSSIONS

Dr. James reported a case of inflammatory abdominal aortic aneurysm in 1935 for the first time. However, barely in 1972 Dr. Walker described histopathological features of inflammatory abdominal aortic aneurysm and formulated a definition in the British Journal of Surgery (4, 11).

Chronic periaortitis represents a rare condition (0, 2 -0, 5/100000/ year) that affect middle - aged/elderly men (12). It includes three diseases that have clinical and pathological related features, and thus being various manifestations of the same disease: inflammatory abdominal aortic aneurysm, idiopathic retroperitoneal fibrosis and perianeurysmal retroperitoneal fibrosis (2, 3, 4). Male sex and smoking are the main risk factors for inflammatory abdominal aortic aneurysm (13). Chronic periaortitis is defined by atherosclerosis of the abdominal aorta, medial thinning, peri-adventitial inflammation and fibrotic reaction enclosing the abdominal aorta correlated with the retroperitoneal inflammatory process (8). Inflammation and autoimmunity have been discussed as the main pathogenic process leading to periaortitis (2, 14, 15). Admitting the pathogenesis of chronic periaortitis appears to associate an immune response localized to a vessel wall, the etiology of the inflammatory reaction is still unknown (4). Inflammatory abdominal aortic aneurysm is not at all correlated with inflammation of other arteries (4, 8).

In the absence of any autoimmune conditions, the pathogenesis of our case of inflammatory abdominal aortic aneurysm could be the result of a local inflammatory reaction to progressive atherosclerosis process, as Mitchinson’s concept proposed about pathogenesis of chronic periaortitis (8). Histological findings include chronic inflammatory infiltrates, comprised B-lymphocytes, even T- lymphocytes and plasma cells in the adventitia distinct to those of atheroma itself (14, 16).

In contrast with non-inflammatory abdominal aortic aneurysm, patients with inflammatory abdominal aortic aneurysm become symptomatic more frequently. The onset of inflammatory abdominal aortic aneurysm is in most cases of nonspecific nature (17). The clinical picture is dominated by abdominal pain, connected to the retroperitoneal mass, which represents the most frequent symptom accompanied by one of these unspecific manifestations of a systemic disease: weight loss, low-grade fever, fatigue, anorexia, vomiting (12). Back or flank pain and colicky pain are suggestive of ureter entrapping (12, 15, 17). Ureteral obstruction is cause of unilateral or worse, bilateral hydronephrosis that leads to renal failure (12, 17).

Diagnosis is made by clinical picture and the imagistic investigations along with nonspecific serologic features. Atheromatous determinations in other territory, cerebral, carotid arteries, ischemic heart disease, complete the clinical picture of inflammatory abdominal aortic aneurysm (12). Inflammation markers, C-reactive protein and erythrocyte sedimentation rate, are invariably raised together with mild normocytic, normochromic anemia and abnormal renal function markers (12, 17).

Contrast-enhanced computed tomography and magnetic resonance imaging are especially important not only for positive diagnosis but for differential diagnosis of a clinical picture centered by abdominal pain and weight loss (5, 18). Computer tomography is the most reliable diagnosis procedure, hence computer tomography images has to be checked cautiously before surgery.
decision to recognize evidence like mantle sign, characteristic inflammatory abdominal aortic aneurysm (3, 5, 17). Retroperitoneal fibrosis may also occur secondary to oncologic diseases such as lymphoma, sarcoma or metastasis and not least related with some drugs - for instance methysergide, methyldopa, beta-blockers (12, 15, 19). Therefore, obtaining biopsy specimen of the fibrotic tissue (intraoperative) is mandatory (17).

CONCLUSIONS
The most favorable management of patients with inflammatory aneurysm is ambiguous. Medical treatment of inflammatory abdominal aortic aneurysm exclusively with corticosteroids is controversial (20, 21). Even if some authors reported initial regression of inflammation, recurrence after stopping steroids has been observed. Corticosteroids are used in inoperable inflammatory aneurysm, even though is well known this treatment do not alter the long-term outcome of the disease (22). Surgical approach seems reasonable even supposing inflammatory aneurysm emerges less likely to rupture than atherosclerotic variant (8) and, in comparison with non-inflammatory aneurysms, inflammatory abdominal aortic aneurysm is related to a four-times higher perioperative morbidity and mortality rate (17). Surgical-open or Endovascular Repair of the aneurysm is the elective treatment particularly when the diameter of the aneurysm exceeds 5 cm (8, 23).

REFERENCES
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**NEWS**

**BIOFILM-INHIBITORY COMPOUNDS AGAINST PSEUDOMONAS AERUGINOSA FROM BURDOCK LEAF**

In a study by Lou Z *et al*, basic anti-biofilm profile data for the compounds in burdock leaf were analyzed and a convenient method for fast screening of anti-biofilm compounds from natural plants was provided. According to this study, 34% ethanol elution fraction of burdock leaf could completely inhibit biofilm formation of *Pseudomonas aeruginosa* at 1 mg·mL(-1). Ultra-performance liquid chromatography-mass spectrometry (UPLC-MS) was used to determine the chemical composition of burdock leaf fraction and to obtain the metabolic fingerprints of burdock leaf fractions before and after inhibiting *P. aeruginosa* biofilm. The analysis identified 11 active compounds: chlorogenic acid, caffeic acid, p-coumaric acid, quercetin, ursolic acid, rutin, cynarin, luteolin, crocin, benzoic acid, and Tenacissoside I. Partial least squares discriminant analysis (PLS-DA) of the metabolic fingerprints showed that, among 81 compounds that were screened as potential anti-biofilm ingredients, rutin, ursolic acid, caffeic acid, p-coumaric acid and quercetin are the main anti-biofilm compounds in burdock leaf (Lou Z, Tang Y, Song X, Wang H. Metabolomics-Based Screening of Biofilm-Inhibitory Compounds against Pseudomonas aeruginosa from Burdock Leaf. *Molecules*. 2015;20(9):16266-77. doi: 10.3390/molecules200916266).