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Coronary Artery Aneurysms and Inflammatory Bowel Disease: A Rare Association Case Report

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Abstract: Inflammatory bowel disease is a complex entity that involves not only intestinal but also systemic manifestations. Several studies describing cardiovascular complications, such as coronary atherosclerosis, aortic aneurysms, vasculitis and pericarditis, have been published. However, the presence of coronary artery aneurysms has not been previously associated with this disease. In this report, we describe a 76-year-old patient with history of ulcerative colitis and coronary artery disease with a coronary angiography revealing the presence of several coronary aneurysms. Since endothelial dysfunction and destruction of elastic fibers due to inflammation could conceivably lead to coronary artery dilatation and aneurysms, we suggest that the inflammatory response in ulcerative colitis may play an important role in the development of some of the aforementioned cardiac complications.

Keywords: Cardiac surgery, aneurysm, coronary artery disease, inflammatory bowel disease, CT scan.

INTRODUCTION

Inflammatory bowel disease (IBD) is an increasingly studied complex entity, involving not only intestinal but also systemic manifestations. Several studies describing cardiovascular complications, such as coronary atherosclerosis, aortic aneurysms, vasculitis and pericarditis, have been published [1]. However, the presence of coronary artery aneurysms has not been previously associated with this disease. In this report we describe a 76-year-old patient with ulcerative colitis (UC) and chest pain history with a coronary angiography revealing the presence of several coronary aneurysms.

CASE PRESENTATION

A 76-year-old man, with a history of chronic ulcerative colitis and ischemic heart disease was referred to our hospital because of chest pain. The patient cardiovascular risk factors included arterial hypertension, ex-smoking and hyperlipidemia. When the patient was 50 years old, he consulted because of rectal bleeding, asthenia, anorexia and lost of weigh. Laboratory tests revealing anemia and cholestasis were performed. A fiber optic colonoscopy showed inflammation and several ulcers in the colonic mucosa. Findings at histopathologic analysis of the mucosa were consistent with ulcerative colitis. Treatment with mesalazine was initiated with good results. No extraintestinal manifestations of the disease were found.

Since 1989 the patient presented three episodes of acute myocardial infarction, all treated with fibrinolysis. No coronary angiography was performed in those episodes. In 2002, an echocardiography showed the presence of a ventricular aneurysm with intraventricular thrombus, and the patient has been on oral anticoagulation to date. He had remained asymptomatic until April 2010, when he was admitted to our Hospital because of chest pain and ST-segment elevation acute coronary syndrome. A coronary angiography revealed three vessel disease and coronary aneurysms. The proximal left anterior descending (LAD) coronary artery had several aneurysmal dilatations, the origin of the intermediate branch showed an aneurysm, while the circumflex artery was occluded (Fig. **1**). The right coronary artery (RCA) showed an anomalous origin from the left sinus, an aneurysm in its proximal segment and it was occluded distally. A multidetector computed tomography

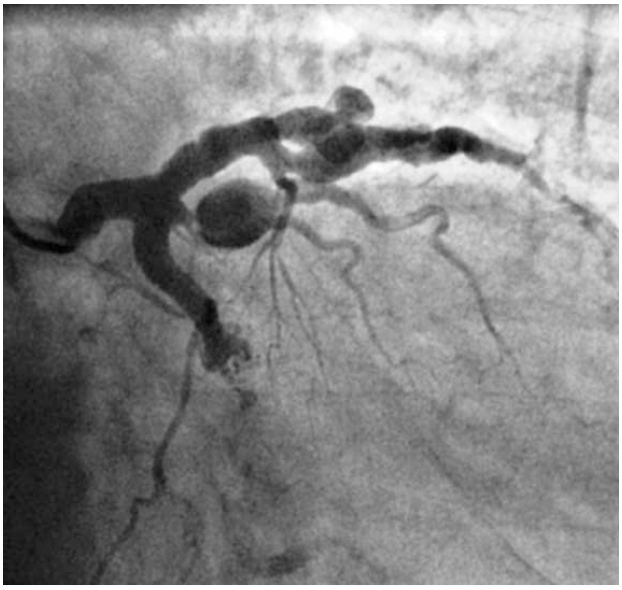

Fig. (1). Preoperative coronary angiography showing aneurysms in the proximal segment of LAD, a giant aneurysm at the origin of intermediate branch and occlusion of circumflex coronary artery.

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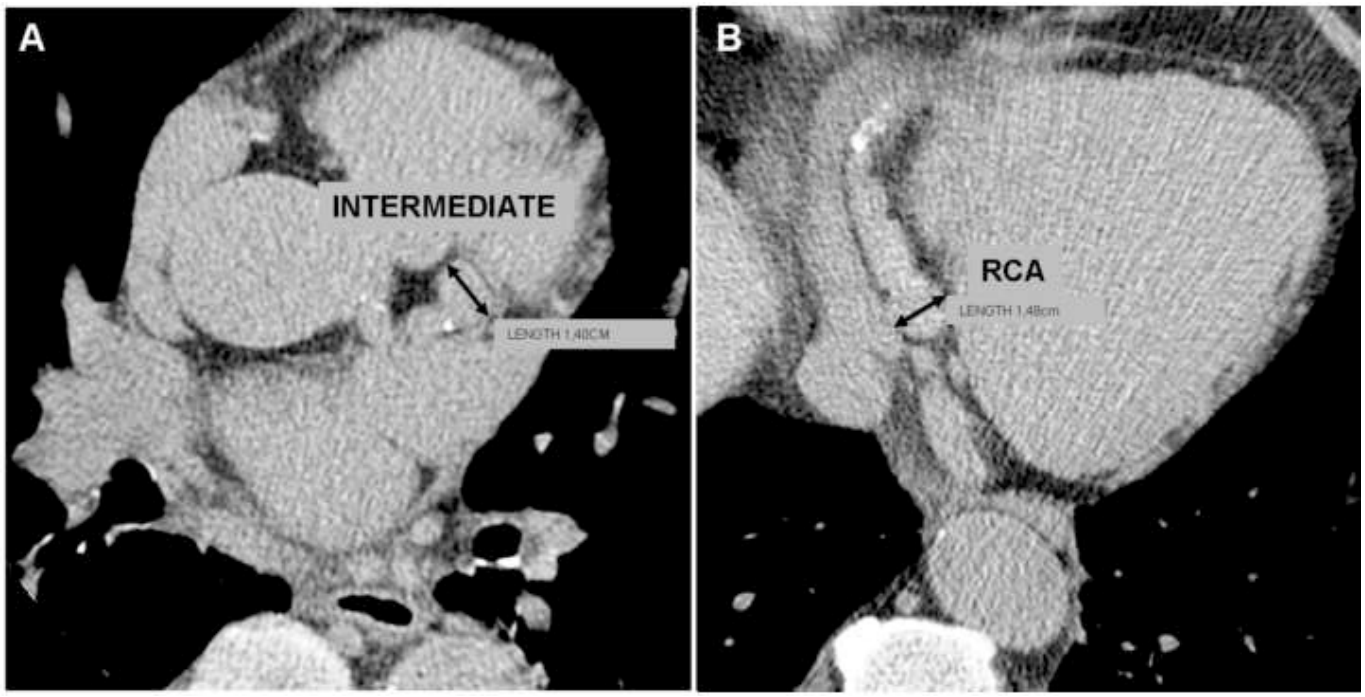

Fig. (2). Preoperative MDCT showing a 14mm diameter aneurysm in the origin of intermediate branch (**A**), and anomalous origin of the RCA from the left sinus, with a 15mm diameter aneurysm in its proximal segment (**B**).

coronary angiography (MDCT) confirmed multiple aneurysmal dilatations in the LAD, the presence of a 14mm diameter aneurysm in the origin of the intermediate branch (Fig. **2A**) and another one of 15mm diameter in the origin of the RCA (Fig. **2B**). The patient was referred for surgery. With mini-extracorporeal circulation a quadruple coronary artery by-pass grafting was performed: left internal mammary artery (LIMA) to LAD, and left radial artery as a "T" composite graft, sequential to diagonal and both marginal arteries. The posterior descending artery was considered not appropriate for grafting. The patient was discharged home on the fifth postoperative day. At 20 months, the patient is doing well with no residual angina.

COMMENT

Coronary artery aneurysms are described as an arterial dilatation 1.5 times the normal diameter. When the dilatation involves an entire vessel it is called ectasia. A giant aneurysm is defined as one with an internal diameter greater than 8mm. The incidence of coronary aneurysms varies from 1.5% to 5% in the general population, and they are more prevalent in males. Atherosclerosis is the main cause of coronary aneurysms in adults (50%). Other causes include congenital (fibromuscular dysplasia), inflammatory (polyarteritis nodosa, lupus erythematosus, Behçet´s and Kawasaki diseases), infective (endocarditis, syphilis, Epstein-Barr, Lyme disease) and traumatic diseases. Complications consist of thrombosis, distal embolization and rupture [2].

IBD is a group of inflammatory disorders of the gastrointestinal tract. The main forms of IBD are ulcerative colitis (UC) and Crohn´s disease. UC is localized in colon and rectum. Systemic and extraintestinal manifestations of this entity are arthritis, delayed growth and sexual maturation, malabsorption syndrome with nutritional deficiency, mucocutaneous lesions, renal dysfunction, hepatic disease and ocular complications. Cardiovascular manifestations in IBD are uncommon and include ischemic heart disease, vasculitis, aortic aneurysms, pericarditis and increased risk of infective endocarditis [1]. The presence of systemic chronic inflammation, with cytokines release and cell adhesion molecules, is proposed as the underlying mechanism of microvascular endothelial dysfunction [3].

Different entities have been associated to IBD, such as angina pectoris [4], vasculitis syndromes, and Takayasu disease. Microvascular endothelial dysfunction and the destruction of elastic fibers of the vessel media layer could result in fragility of its wall, leading to aortic aneurysm development, coronary artery dilatation and coronary aneurysms. In the current report, we found several coronary aneurysms, but no other systemic complications associated with the UC.

The chronic inflammatory response is also proposed as the mechanism involved in the activation of the coagulation system, which could lead to a systemic thrombogenic state [3], generating thrombotic complications, such as atrial thrombi, deep vein thrombosis and pulmonary artery embolism. Interestingly, some genetic factors have been associated with venous and arterial thrombosis in IBD [5]. In patients with thromboembolic complications the mortality rate remains high [6-8].

In summary, although cardiovascular complications in patients with IBD are uncommon, there are no epidemiological data regarding their real prevalence and prognosis. Cardiovascular problems associated with gastrointestinal stress need further study in order to determine treatment and prevention strategies.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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