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Case Report

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Abdominal aortic dissection apropos of a case

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ARTICLE INFORMATION

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The authors declare no competing interests.

Figures
The tomographic images and photo of the surgical procedure are shown with the patient's consent.

Abbreviation
AAD: abdominal aortic dissection

ABSTRACT

Abdominal aortic dissection has a low incidence. It may happen when a small tear or rupture occurs in the tunica intima, dividing the wall layers and forming a false channel, or lumen with blood flow inside. We present the case of a 67-year-old man with a history of high blood pressure, with no regular treatment, who sought care at the Hospital Salvador Allende (Havana, Cuba) as he presented with a week-long abdominal pain radiating to the left iliac fossa and back, which was not relieved by the usual analgesics. An abdominal ultrasound was performed which found an aneurysmal dilatation of the abdominal aorta, with signs of dissection towards the right iliac artery; therefore, computed tomography angiography (CTA) was performed and the diagnosis was confirmed. He underwent aorto-iliac bypass with abdominal-aortic-fenestration and end-to-end anastomosis in both iliac arteries.

Keywords: Abdominal aorta, Dissection, Dissecting Aneurysm, Diagnostic imaging, Computed tomography

Disección de la aorta abdominal a propósito de un caso

RESUMEN

La disección de la aorta abdominal tiene una baja incidencia, se produce a partir de una laceración, desgarro o rotura intimal, con la consecuente separación longitudinal de las capas de la pared y la aparición de una falsa luz con flujo en su interior. Se presenta el caso de un hombre de 67 años de edad con antecedentes de hipertensión arterial, sin tratamiento regular, que acudió al cuerpo de guardia del Hospital Salvador Allende (La Habana, Cuba) por presentar dolor abdominal con irradiación a fosa ilíaca izquierda y espalda, de una semana de duración, que no aliviaba con los analgésicos habituales. Se le realizó ultrasonido abdominal y se encontró una dilatación aneurismática de la aorta abdominal, con signos de disección hacia la ilíaca derecha; por lo que se realizó angiotomografía que confirmó el diagnóstico. Se realizó baipás aorto-ilíaco con fenestración en aorta abdominal y anastomosis término-terminal en ambas arteria ilíacas.

Palabras clave: Aorta abdominal, Disección, Aneurisma disecante, Diagnóstico por imagen, Tomografía computarizada

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INTRODUCTION

The aorta is the largest artery in the body. The descending thoracic aorta travels down through the chest, splitting to become the paired iliac arteries

in the lower abdomen. The aortic wall, which is subjected to high pressures on the ventricular ejection period, consists of three layers: the intima, the innermost layer, the media with muscle and elastic fibers and the adventitia, the outer fibrous layer. With aging, the muscle layers are replaced by collagen fibers, becoming more vulnerable to different disorders, such as aneurysms and dissections.

Thoracic aneurysms are the most frequent involvement in the aortic segments, where dissection can also be found, but with lower incidence (< 2%)[1, 2]. The initiating event in aortic dissection is a tear, laceration or rupture in the aortic intima, leading to separation of the aortic walls, creating a false lumen with blood flow in its interior. Abdominal aortic dissection is life-threatening (15% of aortic rupture)[1] and typically presents with varied and nonspecific symptoms making it difficult to diagnose in the emergency rooms. Mortality is usually about 1%, in the first 48 hours around 75% at one week and up to 95% within the first month[3].

The first globally accepted classification for aortic dissection is that of DeBakey[4] who considered the origin of the intimal tear and extent of dissection. Some 10 years later, in 1970, Stanford[5] presented a simpler classification to the scientific community, depending on whether or not the proximal portion of the ascending aorta was involved. However, neither classification includes aortic dissections originating in the abdominal aorta. Aortic dissection is a relatively rare but highly lethal disease which shares risk factors with other cardiovascular diseases such as abdominal and thoracic aortic aneurysms, and even with ischemic heart disease. Its real incidence in our country is unknown, and to date, only isolated cases have been reported.

CASE REPORT

A 67-year-old man with a history of arterial hypertension with no regular treatment came to the emergency room of *Hospital Salvador Allende* (Havana, Cuba) complaining of a −week-long abdominal pain− radiating to the left iliac fossa and back, which did not alleviate with analgesics. An abdominal ultrasound confirmed aneurysmal dilatation of the abdominal aorta, below the origin of the renal arteries, with an anteroposterior diameter of 34 mm, transverse diameter of 50 mm and length of 79 mm; a dissection was noted (with an intimal flap) extending into the right iliac artery.

He was, therefore, admitted to the Department of Vascular Surgery and underwent computed tomography angiography which showed: Dissecting aneurysm of the infrarenal abdominal aorta extending to the right common iliac artery, before its bifurcation. The left lower pole renal artery was involved along the course of the dissection (ischemia of the artery territory); a dissection flap was noteworthy (**Figure 1**), as well as significant mural thrombosis with reduced filling of the superior mesenteric artery, 2 cm from its origin.

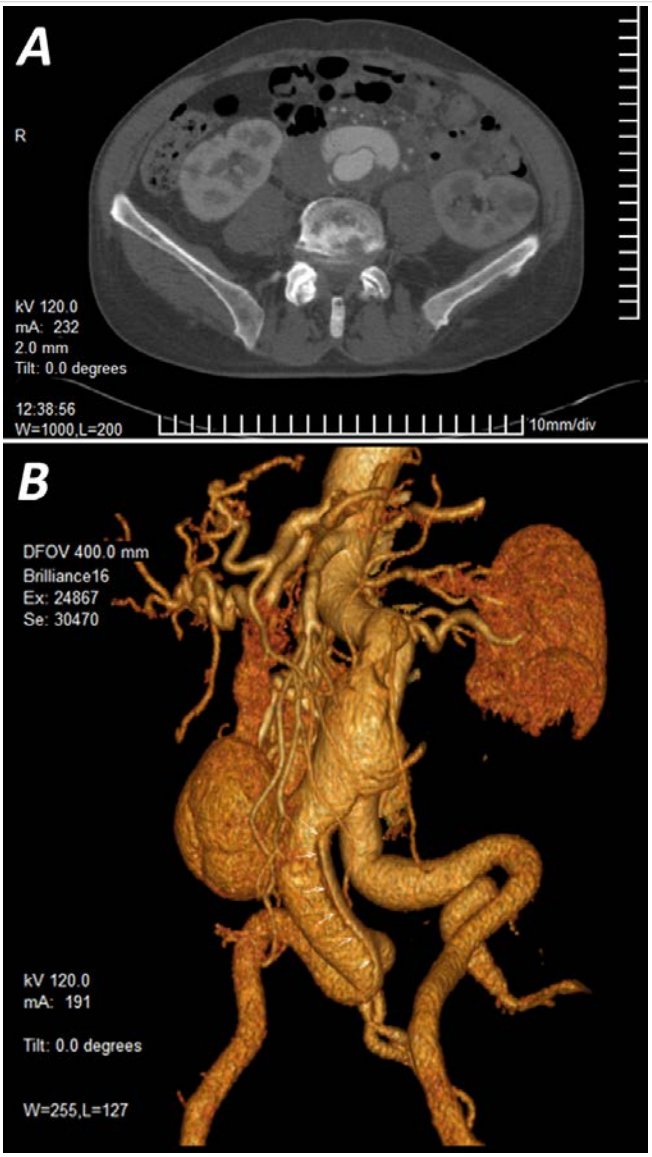

Figure 1. Tomographic images showing juxtarenal abdominal aortic dissection. **A.** Cross section. **B.** Multiplanar reconstruction showing its extension to the right common iliac artery (arrows).

Blood tests were performed showing values within normal parameters. The electrocardiogram, chest X-ray and echocardiogram found no alterations. Surgical treatment was decided (**Figure 2**) and infrarenal abdominal aortic aneurysmectomy was performed with fenestration of intimal-medial flap and interposition of a bifurcated 18 × 9 mm Dacron graft, with proximal end-to-end anastomosis in the aorta and distal end-to-end in both common iliac arteries, close to their bifurcation with the external iliac arteries. Both hypogastric arteries were patent. The patient left the operating room with strong and synchronous distal pulses, and had a favorable subsequent outcome.

COMMENT

Anatomical, structural and hemodynamic factors are involved in the mechanism of AAD production. Deterioration of the mechanical properties of the wall, usually due to degenerative causes, is a common denominator in spontaneous dissection[6]. Other factors affecting the hemodynamics of the human body, such as arterial hypertension and endothelial dysfunction, contribute to vessel wall rupture or laceration.

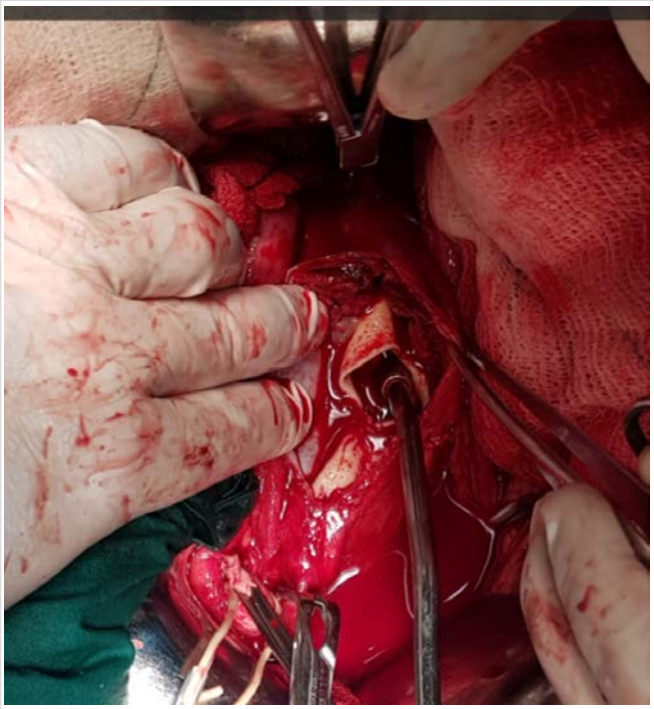

Figure 2. Abdominal aorta repair surgery with end-to-end anastomosis in both iliac arteries.

As in other series reviewed, arterial hypertension is an important risk factor in AAD (51-78% of patients have systemic arterial hypertension)[7]. According to Graham *et al.*[8], about 70% of dissections were spontaneous, as in the case of the patient presented, followed by traumatic cause (15%).

This pathologic entity may have an extremely varied clinical presentation which includes abdominal/thoracic pain, or both, ischemic manifestations at different levels, depending on the vessels involved, and a significant percentage (17%) may be painless and totally asymptomatic[2]; therefore, diagnosis is based on imaging techniques[9]; computed axial tomography scanning is used for confirmation (about 75%), although ultrasound, conventional angiography or magnetic resonance angiography may also be employed[10].

In most cases, the treatment of choice depends on the anatomy of the dissection, hemodynamic parameters, age, and comorbidities[11]. According to numerous publications[12,13], endovascular repair and surgical treatment, depending on the needs of each particular case, would be the most appropriate therapeutic alternatives.

CONCLUSIONS

Abdominal aortic dissection is a disease with a low incidence, more frequent in hypertensive patients. Its clinical course is usually life-threatening if early diagnosis is not made. Imaging techniques, especially computed tomography angiography, are the cornerstone of diagnosis and to date, endovascular and surgical repair are the most effective treatments.

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