Rev Bras Cir Cardiovasc 2009; 24(2): 245-248

Hemoptysis and hemothorax as presentation of thoracic aortic rupture

Hemoptise e hemotórax como apresentação de ruptura de aorta torácica

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RBCCV 44205-1084

Abstract

Thoracic aortic dissection is a disease of great mortality in its initial phase, but in some cases it can assume chronic course. We report a case of a patient with Stanford type A1 aortic dissection, admitted with mental confusion, dyspnea and event of severe hemoptysis. Electrocardiogram showed unspecific change and chest X-ray revealed opacification of the left hemithorax. Transthoracic echocardiogram did not show aortic dissection, but showed image similar to hemithorax leading to the suspicion of aortic rupture. The patient developed cardiovascular collapse and evolved to death. This case describes two unusual presentations of aortic dissection: hemothorax and severe hemoptysis.

Descriptors: **Aneurysm, dissecting/surgery. Aortic aneurysm, thoracic/complications. Hemothorax. Fistula. Echocardiography.**

Resumo

Dissecção da aorta torácica é doença de grande mortalidade em sua fase inicial, mas pode, em alguns casos, se cronificar. Relatamos caso de paciente com dissecção crônica de aorta tipo B (Stanford), admitido na Emergência com confusão mental, dispnéia e relato de hemoptise importante. O eletrocardiograma mostrava alterações inespecíficas e a radiografia de tórax revelou opacificação do hemitórax esquerdo. O ecocardiograma transtorácico não evidenciou dissecção aórtica, mas demonstrou imagem compatível com hemotórax, ocasionando a suspeita de ruptura da aorta. O paciente evoluiu em colapso cardiovascular e óbito. Este caso descreve duas apresentações atípicas da dissecção de aorta: hemotórax e hemoptise importante.

Descritores: **Aneurisma dissecante/cirurgia. Aneurisma da aorta torácica/complicações. Hemotórax. Fístula. Ecocardiografia.**

INTRODUCTION

The thoracic aortic dissection is one of the diseases with higher mortality rates. Among its complications are aortic insufficiency, coronary involvement with acute myocardial infarction and rupture with cardiac tamponade [1]. In the case of rupture, its presentation is usually severe chest pain, piercing, with abrupt onset and irradiation mainly to the back, and with high blood pressure. Among the unusual presentations, are described the retropharyngeal hematoma, hemothorax and massive hemoptysis secondary to aorto-bronchial fistula, with incidence less than 10% of the cases [2].

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This study was carried out at the Heart Institute (InCor), Medical School of the University of São Paulo - São Paulo, SP, Brazil.

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Article received on August 6th, 2008
Article accepted on December 15th, 2008

CASE REPORT

In September 2007, a 77-year-old male patient, brown, from Sao Paulo, was cared. He sought the Emergency Service of the Heart Institute (InCor) presenting sudden onset of dyspnea 6 hours before entry, with thoracic ventilatory-dependent pain and several episodes of hemoptysis of large volume (total loss estimated at 300-400 ml).

As morbid history, the patient presented chronic renal failure on conservative treatment, type 2 diabetes mellitus, ex-smoker and hypertensive for several years, under use of hydrochlorothiazide 25 mg, propranolol 80 mg 12/12h, amlodipine 5 mg 12/12h, hydralazine 50 mg 8/8h and 40 mg furosemide. Also, the patient was carrier of chronic aortic dissection type B under clinical treatment for refusing to surgical treatment. On the occasion, his angioresonance has shown aorta with tortuous path measuring 38 mm in the aortic root and 42 mm in the ascending aorta. Proximal aortic arch measuring 37 mm, medial arch, 36 mm, distal arch and initial portion of the descending aorta (dilated and with maximum diameter of 72 mm). Thoraco-abdominal transition of 40 mm.

After junction of the left subclavian artery, it was shown line of dissection extending up to the abdominal aorta. Partially thrombosed false lumen. Larger diameter of 72 mm with true lumen of 30 mm in the initial portion of the descending thoracic aorta. The main images are shown in Figure 1 (A, B, C, D and E). The last radiological assessment of the patient was performed a year before admission.

On admission, he was in regular general condition, sleepy, pale (+3/+4), with the following vital data: heart rate of 72 bpm, respiratory rate 32 ipm, $SatO_2$ 86% in ambient air, PA 110X70 mmHg. Pulmonary auscultation revealed reduction of noise in the left hemithorax and cardiac auscultation revealed hyperphonetic sound. The abdominal examination showed no abnormalities and distal pulses were symmetrical.

In his development, pending the initial examination, presented hemodynamic instability, with no recurrence of hemoptysis. Before volume expansion with crystalloid and hemotransfusion, in addition to the use of vasopressor drugs (norepinephrine), the patient presented with improvement of blood pressure and peripheral perfusion.

Fig. 1 – Thoracic aortic angioresonance, showing aortic dissection after junction of the left subclavian artery (aortic dissection type B (Stanford). It is noted, after initiation of the dissection, partially thrombosed false lumen, that extends from the initial portion of the dissection up to the thoraco-abdominal transition

The electrocardiogram (ECG) showed only nonspecific changes. Chest radiography showed enlargement of the mediastinum, deviation of the trachea to the right and whole opacification of the left hemithorax (Figure 2). Laboratory tests showed: Hemoglobin 6.5mg/dL, hematocrit 19%, total count of leukocytes 14.700/mm^3, platelet count 195,000, creatinine 6.15mg/dL, urea 139 mg/dL and normal coagulogram.

The patient continued to worsen his clinical status, developing respiratory failure, which required orotracheal intubation and mechanical ventilatory support.

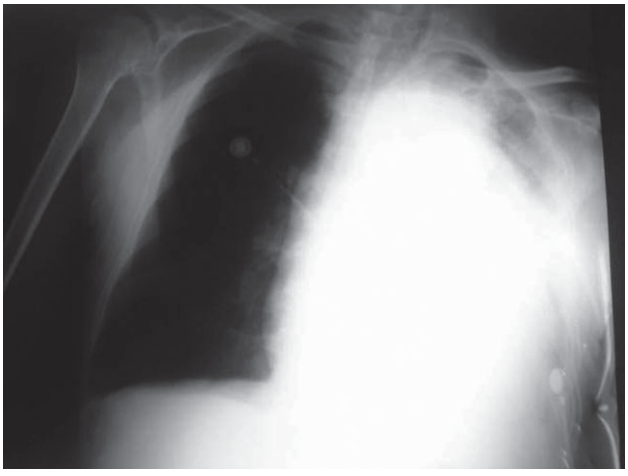

Fig. 2 – Chest radiography with partial opacification of the whole left hemithorax; ***disappearance*** *of the* ***cardiac silhouette and mediastinal structures; with deviation of the trachea to the left***

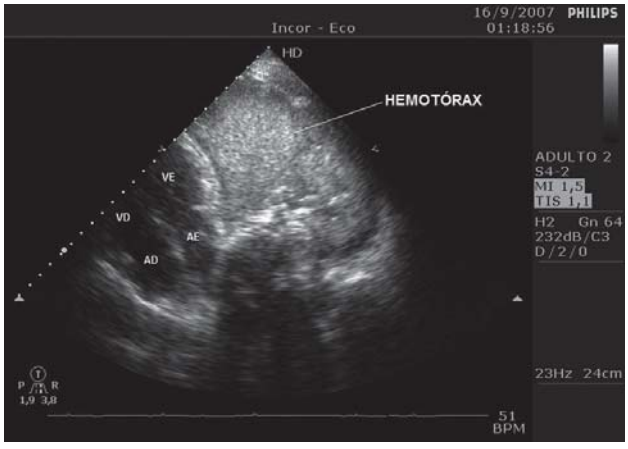

Fig. 3 - Transthoracic echocardiography showing image of increased density compatible with blood, located in the left pleural space

Then, bedside transthoracic echocardiography was performed, which revealed the presence of large amount of liquid with a density compatible with blood in the left pleural space, confirming initial clinical hypothesis of hemothorax (Figure 3). The ascending aorta was not properly visualized due to limited echocardiographic window. Currently, the diagnostic hypotheses were: aneurysm and rupture of the thoracic aorta with massive hemothorax and aorto-bronchial fistula.

Cardiovascular collapse and bradycardia made not possible the performing of transesophageal method.

The patient developed refractory shock in an attempt to clinical stabilization, without the possibility of surgical treatment, and death in the follow-up. Autopsy examination was not performed.

DISCUSSION

In this study, we present a case of a patient with previous diagnosis of chronic aortic dissection type B (Stanford) since at least 2 years, who refused to undergo surgery, admitted in the emergency service presenting mental confusion, chest pain and episodes of hemoptysis. Chest radiography showed left lung opacification, compatible with hemothorax, which was also shown with bedside transthoracic echocardiographic study.

Among the available exams for the diagnosis of aortic dissection, the echocardiogram is an excellent method because it can be performed at bedside, without the need for transportation of the patient, situation to be considered in the case of hemodynamic instability. The transesophageal echocardiography shows sensitivity similar to angiotomography and aortic angioresonance in the dissection diagnosis [3]. In specific studies, it has shown a rapid and accurate method, reducing significantly the time to refer the patient for surgical treatment and therefore the mortality [4].

The patient's progressive cardiovascular collapse was unable to achieve the aforementioned exam and other exams, and thus more accurate diagnosis. However, the detection of image compatible with blood inside the left pleural space (hemothorax) in the transthoracic echocardiogram was strong evidence for the diagnosis of thoracic aortic rupture. This is one of the major differential diagnoses for patients with non-traumatic hemothorax, with mortality exceeding 90% [5-7].

Moreover, the presence of hemothorax is an important negative prognostic factor, in addition to the presence of pericardial effusion with or without tamponade and patency of the dissection's false lumen [8]. Another important aspect is the history of frank hemoptysis before the arrival of the patient to the emergency service, a fact consistent with the presence of aortobronchial fistula. The fistula between the

proximal aorta and the pulmonary artery is a severe complication, most often fatal, and its rapid diagnosis is an important aspect for surgical correction and patient's survival [9]. This patient evolved with rapid clinical deterioration with refractory shock, cardiovascular collapse and death, without the possibility of surgical treatment.

In the stable, chronic cases, the recommendation of the Brazilian Society of Cardiology guidelines is to refer all symptomatic patients for surgical correction, and in the asymptomatic ones - where the largest diameter of the thoracic aorta (in the case of descending aorta) exceeds 6.0 cm. Currently, there is also more opening to the percutaneous treatment (stent implantation) in centers with more experience in this approach, and in those patients with favorable anatomy [10].

REFERENCES

1. Sociedade Brasileira de Cardiologia. Diretrizes para cirurgia das doenças da aorta. Arq Bras Cardiol. 2004;82(supl V):36-50.

2. Newton AI. Spontaneous retropharyngeal hematoma: an unusual presentation of thoracic aortic dissection. J Emerg Med. 2006;31(1):45-8.

3. Nienaber CA, von Kodolitsch Y, Nicolas V, Siglow V, Piepho A, Brockhoff C, et al. The diagnosis of thoracic aortic dissection by noninvasive imaging procedures. N Engl J Med. 1993;328(1):1-9.

4. Penco M, Paparoni S, Dagianti A, Fusilli C, Vitarelli A, De Remigis F, et al. Usefulness of transesophageal echocardiography in the assessment of aortic dissection. Am J Cardiol. 2000;86(4A):53G-6.

5. Ayrik C, Cece H, Aslan O, Karcioglu O, Yilmaz E. Seeing the invisible: painless aortic dissection in the emergency setting. Emerg Med J. 2006;23(3):e24.

6. Gandelman G, Barzilay N, Krupsky M, Resnitzky P. Left pleural hemorrhagic effusion. A presenting sign of thoracic aortic dissecting aneurysm. Chest. 1994;106(2):636-8.

7. Little S, Johnson J, Moon BY, Mehta S. Painless left hemorrhagic pleural effusion: an unusual presentation of dissecting ascending aortic aneurysm. Chest. 1999;116(5):1478-80.

8. Bossone E, Evangelista A, Isselbacher E, Trimarchi S, Hutchison S, Gilon D, et al. Prognostic role of transesophageal echocardiography in acute type A aortic dissection. Am Heart J. 2007;153(6):1013-20.

9. Thistlethwaite PA, Kriett JM, Madani MM, Jamieson SW. Acquired aortopulmonary fistula in acute dissection. J Thorac Cardiovasc Surg. 2001;121(6):1213-5.

10. Albuquerque LC, Braile DM, Palma JH, Saadi EK, Gomes WJ, Buffolo E. Diretrizes para o tratamento cirúrgico das doenças da aorta da Sociedade Brasileira de Cirurgia Cardiovascular. Rev Bras Cir Cardiovasc. 2007;22(2):137-59.