

## Pericardial Effusion Revealed an Aortic Dissection: Case Report and Recent Review of the Literatures

Salma Bellamqaddam, Ilham Benhmed, kaouthar Benjaout, Amine Ghalem, Mohammed Aabdi and Nabila Ismaili,  
Noha Elouafi

Mohammed IV Teaching Hospital, Department of Cardiology, Oujda, Morocco.

### ARTICLE INFO

#### Article history:

Received: 3 April 2017;

Received in revised form:

30 August 2017;

Accepted: 7 September 2017;

#### Keywords

Aortic dissection,  
Pericardial effusion,  
Diagnostic delay.

### ABSTRACT

Pericardial effusions are frequent conditions, their etiologies are dominated by: acute infarction of the myocardium, myocarditis, metabolic disorders, certain neoplasias, inflammatory or infectious diseases, traumatism and cardiac surgery. The dissection of the aorta is one of the rare conditions; it is primarily due to a rupture of the ascending aorta and presents diagnostic difficulties. We report the case of an 80 years old male, with a medical history of chronic smoking stopped since 2 years, a recently discovered hypertension, a surgery for an inguinal hernia and appendicitis. Presented in our formation with an expansive pericardial effusion; clinical examination found an asymmetry of upper extremity blood pressures, thoracic radiography showed an unrolled aorta. Thoracic CT scan has allowed the diagnosis of aortic dissection type 1 of De Bakey classification and type A of Stanford. The patient was referred to a cardiovascular surgical center where he benefited of the replacement of the dissected aorta by a prosthetic tube while preserving his native valve, with positive outcomes. Our clinical observation aims to discuss diagnosis of dissection to any pericardial effusion or pericarditis, even in the absence of usual symptoms, in order to avoid any diagnostic delay. In our methodology we have overviewed a systemic review included PubMed; all of our results in discussion are not based on basis recommendations because of the uncommon presentation having a problem in extrapolating strong evidence but we have reporting some basis of experts' opinion.

© 2017 Elixir All rights reserved.

### Introduction

The pericardium is a serous membrane surrounding the heart; it is composed anatomically of a fine internal visceral layer called epicardium, and an external parietal resistant layer called pericardium. Pericardial effusion is a pathological increase in the intra-pericardial liquid, etiologies are dominated by: acute infarction of the myocardium, myocarditis, metabolic disorders, certain neoplasias, inflammatory or infectious diseases, traumatism and cardiac surgery. The dissection of the aorta is one of the rare etiologies, it is primarily due to a rupture of the ascending aorta and presents diagnostic difficulties.

### Observation

We report the case of an 80 years old male, with a chronic smoking stopped since 2 years, a recently discovered hypertension, a surgery for inguinal hernia and appendicitis. For 15 days he presented progressively an exertional dyspnea associated with chest pain in the leaning ahead position with a preserved general state. Clinical examination found respiratory frequency of 20/min, a heart rate of 119/min and a blood pressure of 150/100 mmHg in the left arm and 130/100 mmHg in the right arm, heart sounds were muffled. The EKG revealed a left axial deviation, poor R wave progression, negative T waves in the inferior territory, and ventricular extrasystoles. Chest X-ray showed an unrolled aorta and a water bottle configuration of the cardiac shadow with a cardio-thoracic ratio of 0,7 [figure1].

Echocardiography objectified an abundant circumferential pericardial effusion (25 mm en retro-VG, 22 mm antéro-VD et latéro-VD) without respiratory variations of trans-valvular flows nor compression of the right cavities, the vena cava was not dilated, and there were no anomalies on the aortic valve.

Biological assessment has revealed an anemia with a Hb at 9.2 g/dL, a hyperleucytosis at 14520/mm<sup>3</sup>, a moderate impaired renal function with a creatinin at 12,63 g/l (creatinin clearance = 58 ml/min), troponin value was normal and CRP was increased at 217.52 mg/l.

The cervical and thoraco-abdomino-pelvic CT Scan identified an aortic dissection of the ascending aorta extended to the brachiocephalic trunk [figure2].

The patient's condition was stabilized, and the surgical indication was established, therefore the patient was referred to a cardiovascular surgery center.

### Discussion

The aortic dissection is a longitudinal tear in the aortic wall starting from an intimal breach which can occur in variable segments of the aorta. It is a serious event threatening the patient's life, the polymorphic clinical presentation makes all diagnosis difficult [1]. The acute aortic dissection was first described 200 years ago by Dr Nicholls, doctor of King George II. It is correlated with a high rate of morbidity and mortality, lethality is due to serious physiological disorders and complications such as

cardiac tamponde, myocardial infarction and hypoperfusion of the brain, the kidneys, the spinal cord ... [2].

In our case rapport a pericardial effusion can be the first sign –during early stages– of the aortic dissection. There is an interval between the beginning of the pericardial effusion and occurrence of a fatal hemorrhage of the aorta which allows the diagnosis; the surgical treatment must be early in order to improve survival [3]. Clinically, 90% of aortic dissections are revealed by brutal and intense chest pain. However, some patients remain asymptomatic (6%) [4]. Unfortunately this clinical situation is uncommon, and the pericardial effusion is not often detected in patients who die of aortic dissection: series of autopsy of Hirst and his colleagues showed that only 6% had a detectable pericardial effusion and only 4% had a pericardial fraction [5].

These data are coherent with the observation carried out at Henry Ford hospital in Detroit: 3 of the 104 patients with aortic dissection had a pericardial effusion. Clinical presentation and EKG of pericardial effusion complicating an aortic dissection are not specific [6]. The often selected diagnosis is the one of idiopathic pericarditis. This error of diagnosis is reinforced by the higher total prevalence of the idiopathic pericarditis compared to the aortic dissection. Only a suspicion of a high probability of pericardial effusion associated with aortic dissection can facilitate the diagnosis. The chest X-ray in a front view had a diagnosis sensitivity of 67%, in can show a widening mediastinum, a pleural effusion or an abnormal aortic contour as in the case of our patient where the aspect of unrolled aorta was among the telltale signs.

The echocardiography occupied an important place, it can show signs of cardiac tamponade which is a frequent complication of aortic dissection Type A, occurring in 19% of the patients in an international register, and which is correlated with a high rate of mortality [7,8]. The origin of the pericardial effusion is probably a slow escape of blood in the pericardial cavity starting from the aorta, before the aortic rupture which can lead to a massive and fatal hemorrhage [9]. When clinical, radiological and echocardiographic signs allow suspecting a rupture or a dissection of the aorta – such as in our patient's case – thoracic CT Scan with injection of contrast agent must be carried out immediately. Not only does it allow carrying out the diagnosis by identifying the dilated aorta, the false channel and the intimal breach, but also it can show some complications due to the dissection such as hemopericardium or hemothorax [10].

**No conflict of interest**

**Photos**

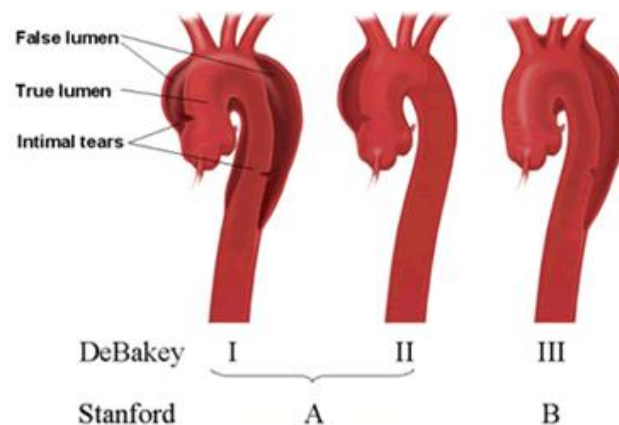


**Figure 1. Thoracic CT Scan with contrast agent injection.**



**Figure 2. Chest X-ray : front view.**

#### Anatomy and Classification of Aortic Dissection



#### Conclusion

Our clinical observation encourages thinking of aortic dissection in front of any pericardial effusion or pericarditis, even in the absence of usual symptoms, in order to avoid any noxious diagnostic delay.

#### References

- 1-Becquemin J-P, Majewski M, Desgranges P, et al. Traitement endovasculaire des dissections de l'aorte thoracique et thoracoabdominale. In: EMC Techniques chirurgicales — Chirurgie vasculaire; 2011. p. 43—149.
- 2-Hirst Jr AE, Johns Jr VJ, Kime Jr SW. Dissecting aneurysm of the Naorta: a review of 505 cases. *Medicine (Baltimore)* 1958;37: 217e79.
- 3-Saner HE, Gobel FL, Nicoloff DM, Edwards JE. Aortic dissection presenting as pericarditis. *Chest*. 1987 Jan; 91(1): 71-4.
- 4-Hiratzka LF, Bakris GL, Beckman JA, et al. 2010 ACCF/AHA/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the diagnosis and management of patients with thoracic aortic disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, American Association for Thoracic Surgery, American College of Radiology, American Stroke Association, Society for Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society for Interventional Radiology. Society of Thoracic Surgeons, and Society for Vascular Medecine (developed in collaboration with the American College of Emergency Physicians). *J Am Coll Cardiol* 2010;55: 1509—44.

- 5-Hirst AE Jr, Johns VJ Jr, Kime SW Jr. Dissecting aneurysm of the aorta: a review of 505 cases. *Medicine* 1958; 37:217-79
- 6-Morris AL. Pericarditis and impending rupture of aneurysms of the ascending aorta. *Can Med Assoc* 1982; 126:1190-91
- 7-Nishigami K. Point-of-care echocardiography for aortic dissection, pulmonary embolism and acute coronary syndrome in patients with killer chest pain: EASY screening focused on the assessment of effusion, aorta, ventricular size and shape and ventricular asynergy. *J Echocardiogr*. 2015 Dec;13(4):141-4
- 8-Gilon D, Mehta RH, Oh JK, et al. International Registry of Acute Aortic Dissection Group. Characteristics and in-hospital outcomes of patients with cardiac tamponade complicating type A acute aortic dissection. *Am J Cardiol*. 2009;103(7):1029-31
- 9-C P Charalambous MB ChB R Malik MRCP PhD Schofield MB ChB MRCP S Arya MB MRCP1 A M Heagerty ,MD FRCP. Aortic dissection with chronic haemopericardium *J R Soc Med* 1999;92:638-639
- 10-A. Rhanim, L. Herrak, H. Slimani, L. Achachi, M. El Ftouh. Une cause rare de pleurésie hémorragique: la dissection de l'aorte. *Revue des Maladies Respiratoires*. Available online 27 January 2016
- 11-Keiko T1, Yanagawa Y, Isoda S. A successful treatment of cardiac tamponade due to an aortic dissection using open-chest massage. *Am J Emerg Med*. 2012 May;30(4):634.e1-2. doi: 10.1016/j.ajem.2011.01.028. Epub 2011 Mar 15
- 12-Hagan PG, Nienaber CA, Isselbacher E, et al. The international Registry of Acute Aortic Dissection (IRAD): new insights into an old disease. *JAMA* 2000;283:897-903
- 13-Jean-Philippe Verhoye , Issam Abouliatim , Antoine Larralde, Xavier Beneux , Jean-François Heautot. Chirurgie de la dissection aortique : pour quel patient ? . *La Presse Médicale*, volume 40, n° 1P1, pages 72-80 (janvier 2011)
- 14-Chavanon O, Costache V, Bach V, Kétata A, Durand M, Hacini R, Thony F, Blin D. Preoperative predictive factors for mortality in acute type A aortic dissection: an institutional report on 217 consecutive cases. *Interact Cardiovasc Thorac Surg*. 2007 Feb;6(1):43-6. Epub 2006 Oct 10.