

Acute Type A Aortic Dissection Initially Diagnosed with Myocardial Infarction

Chang Hyu Choi, M.D., Ph.D., Chul Hyun Park, M.D., Ph.D., Kook Yang Park, M.D., Ph.D.,
Yang Bin Jeon, M.D., Ph.D., Jae Ik Lee, M.D., Ph.D.

Acute type A aortic dissection (AAD) is a potentially fatal condition that requires rapid assessment and treatment. However, a correct diagnosis is not always the rule, as misdiagnosis occurs in less than half the cases [1,2]. Among many conditions, AAD is frequently confused with acute myocardial infarction (AMI), leading to delayed diagnosis and inappropriate treatment with antiplatelet, antithrombin, and fibrinolytic therapies [1].

To determine the percentage of AAD patients initially diagnosed with AMI and analyze the clinical course of these patients, we retrospectively reviewed 78 cases of AAD. From July 2003 to May 2012, 48 men and 30 women admitted to our hospital were eventually diagnosed with AAD. Their age

ranged from 26 to 83 years, with a mean of 53.3 ± 16.1 years. Six patients (7.7%, 6/78) were initially diagnosed with AMI (Table 1). Emergency coronary angiography was performed on 4 patients at a mean of 64 minutes after their admission. All 6 patients received thrombolysis. Although a correct diagnosis was delayed in all 6 patients, five underwent operations, that is, all except one (patient no. 4) who died of cardiogenic shock before he arrived at the operation room. Patient no. 3, who also had preoperative cardiogenic shock, underwent an emergency operation right after coronary angiogram without undergoing a thoracic computed tomography. Most of the patients received a large transfusion volume even though they did not undergo re-exploration.

Table 1. Details of the misdiagnosed patients

Patient no.	Age (yr)	Gender	Risk score	Cardiac troponin	ST segment elevation (ECG)	Mediastinal widening (CXR)	Admission-coronary angiography (min)	Admission-correct diagnosis (min)	Operation	Result
1	55	Male	1	0.03	Yes	No	95	240	Yes	Alive
2	33	Male	2	0.877	Yes	Yes	41	1,640	Yes	Alive
3	61	Female	2	0	Yes	Yes	55	130	Yes	Death
4	61	Male	1	0.023	Yes	Yes	65	270	No	Death
5	76	Female	1	0.13	Yes	No		130	Yes	Alive
6	71	Male	2	0.03	No	Yes		270	Yes	Alive

ECG, electrocardiogram; CXR, chest X-ray.

Department of Thoracic and Cardiovascular Surgery, Gil Hospital, Gachon University

† This manuscript has been presented at the 43th Autumn Academic Meeting of the Korean Thoracic and Cardiovascular Society.

Received: July 9, 2012, Accepted: July 20, 2012

Corresponding author: Chul Hyun Park, Department of Thoracic and Cardiovascular Surgery, Gil Hospital, Gachon University, 21 Namdong-daero 774beon-gil, Namdong-gu, Incheon 405-760, Korea
(Tel) 82-32-460-8426 (Fax) 82-32-460-3117 (E-mail) cdgpch@gilhospital.com

© The Korean Society for Thoracic and Cardiovascular Surgery. 2012. All right reserved.

© This is an open access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

In 2010, the American Heart Association and American College of Cardiology released guidelines for early detection of thoracic aortic disease (TAD) [3]. The sensitivity of the TAD guideline diagnostic algorithm has been known to be as high as 95.7% [4]. In our cohort, 3 patients were categorized as an intermediate risk group (risk score 1) and the others were categorized as a high risk of AAD (risk score 2) according to this algorithm. If we had followed the TAD guideline, the misdiagnosis could have been avoided in the high risk patients. However, in the case of the intermediate risk patients, application of this guideline would not have had a significant impact. Since all of the 3 intermediate risk patients had ST segment elevation on electrocardiogram (ECG), they would have been put on the AMI track. Therefore, we believe that some modification is needed in the TAD algorithm; in the intermediate risk group, chest X-ray (CXR) findings such as mediastinal widening should be considered in advance of ECG findings. In our cohort, if patient no. 4 in the intermediate risk group who had a widened mediastinum on CXR had been diagnosed earlier, he would have received a rapid and appropriate treatment.

Another concern is about the protocol of AMI-evaluation by the Health Insurance Review & Assessment Service (HIRA). According to this protocol, thrombolytic therapy should be started within 60 minutes and primary percutaneous coronary intervention within 120 minutes after AMI patients arrive at a hospital. This protocol also plays some role in delayed diagnosis of AAD and inappropriate treatment. There-

fore, we suggest that a nationwide survey of this misdiagnosis issue be done to modify the HIRA protocol.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Hansen MS, Nogareda GJ, Hutchison SJ. *Frequency of and inappropriate treatment of misdiagnosis of acute aortic dissection*. Am J Cardiol 2007;99:852-6.
2. Erbel R, Alfonso F, Boileau C, et al. *Diagnosis and management of aortic dissection*. Eur Heart J 2001;22:1642-81.
3. Hiratzka LF, Bakris GL, Beckman JA, et al. *2010 ACCF/AHA/AATS/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 of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of Thoracic Surgeons, and Society for Vascular Medicine*. Circulation 2010;121:e266-369.
4. Rogers AM, Hermann LK, Booher AM, et al. *Sensitivity of the aortic dissection detection risk score, a novel guideline-based tool for identification of acute aortic dissection at initial presentation: results from the international registry of acute aortic dissection*. Circulation 2011;123:2213-8.