Clinical Significance and Impact of “Painless” Acute Aortic Dissection

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Aortic Dissection as an Urgent Disease

Aortic dissection is a separation of the aortic wall at the media (not including intimal detachment or sub adventitial hematoma), in which the dissection extends for a certain length (at least 1 cm). It is called a “condition in which the wall becomes a double lumen”. Since acute aortic dissection (AAD) is a sudden onset, life-threatening disease, it requires immediate management (such as determining whether or not surgery is indicated) and close observation (intensive care unit or similar care) in the post-onset acute phase. Diagnosis of AAD requires demonstration of a separation of the partitioning wall (flap) and detection of a tear (an opening from the true lumen to the false lumen), re-entry from the false lumen to the true lumen.

Nearly all AAD patients complain of intense chest or back pain at the time of onset, and the rate of a certain diagnosis of AAD in patients who complain of pain in the back area is very high. With chest pain, however, the rate of a certain diagnosis of AAD is low, at around 80%, and when there is pain in other locations, such as epigastric pain, the diagnosis rate for dissection is very poor. With painless AAD, in which there are no complaints of pain at the time of onset, diagnosis is exceedingly difficult. The frequency of painless AAD was reported to be 6.4% in an IRAD review, and was about 10% in 450 of our patients, but Imamura et al reported a frequency of 17% and a significantly higher number of patients with disturbance of consciousness or serious disease, so vigilance is needed.

To make the precise diagnosis, careful attention is paid to the existence of “clues” for suspected dissection from subjective symptoms in cardiovascular emergencies, even in a general clinical ward. Based on such clues (Table), it is necessary to investigate whether or not the next step (definite diagnostic examination) of ultrasound examination and then CT examination or transfer to a specially equipped hospital (affiliated hospital within the region) is needed.

“Clues” for suspected AAD are symptoms and physical findings other than pain that indicate the possibility of AAD. If several such clues are present, AAD is suspected, and further evaluation should be performed. Of these clues, special attention is paid to right–left differences in brachial blood pressure (frequency 20–30%), bradycardia, and heart murmur from aortic regurgitation. Moreover, although a widened mediastinum on a plain chest radiograph is important, there are also reports that 20% of patients with AAD do not have a widened mediastinum, and this is not a basis for ruling out AAD.

When there is still some uncertainty about a diagnosis of AAD based on these findings, proceeding to the next step is recommended. AAD is a serious disease (including complications such as stroke); if there is some suspicion of AAD, the appropriate examinations should be performed until it can be ruled out. The diagnosis of AAD is possible with noninvasive ultrasound examination (transthoracic echocardiography or vascular ultrasonography). Development of a system for CT or transesophageal echocardiography for definite diagnosis in the hospital or within the community should also be considered.

In nearly all cases of AAD, some symptoms are present at onset, and these symptoms produce the following conditions.

(1) Pain Pain accompanying separation of the aortic wall is a cardinal symptom at the time of onset. There is chest or back pain in nearly all cases.

(2) Ischemic Symptoms of Branch Vessels There are cases with branch vessel involvement and cases with aneurysm or with thrombus in the aortic wall that spreads to the periphery. Symptoms differ depending on the organ affected in the peripheral region, and ischemic symptoms that may occur include disturbance of consciousness related to head and neck arteries (reported incidences of cerebral ischemic symptoms are 6–10%, or about 20%; sometimes accompanied by fluctuating symptoms), chest pain from coronary arteries, limb pain from limb arteries, and abdominal pain from the superior mesenteric artery.

(3) Compression Symptoms Around the Aneurysm When an aneurysm is formed in the chronic stage, symptoms depend on its location (eg, hoarseness, dysphagia).

Significance of Painless Dissection in Cardiovascular Emergency Medicine

Most diseases in which there is chest or back pain are emergencies, and differentiation between serious cardiovascular diseases (acute coronary syndrome, AAD, pulmonary embolism) and noncardiovascular diseases (lungs, gastrointestinal tract, gallbladder, kidneys, nerves) is necessary to understand the cause of the pain.

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Relationship With Stroke as an Emergency Disease

From the perspective of the clinical treatment of stroke, special attention is needed in cases when thrombolytic treatment is given in the acute stage of stroke. According to the results of a 2007 usage survey after recombinant tissue plasminogen activator (rt-PA), a thrombolytic agent, had been administered, there were 10 cases in which death occurred after t-PA was used in acute-stage stroke patients who had AAD. This type of adverse outcome must absolutely be avoided.

It has been reported that 6–20% of AAD patients have concomitant stroke; thus, it is necessary to determine whether AAD is present in all stroke patients in the hyperacute phase. With stroke, however, many patients have no pain, which is a characteristic symptom of AAD, so dissection is not obvious from pain during the acute phase of stroke. 

Signs that can be observed during the clinical treatment of stroke include the following, together with the clues in Table.

(1) Bradycardia In many cases, AAD comes from the ascending aorta to the right common carotid artery, and bradycardia readily occurs from the carotid reflex.

(2) Left Hemiplegia Since the right carotid artery is involved in many cases, left hemiplegia is more common.

(3) Decreased Blood Pressure The incidence of decreased blood pressure is unclear, but caution is needed in patients who do not have especially high blood pressure in the acute stage despite a history of hypertension.

The significance of painless AAD has been described above; however, although the incidence of stroke as a complication of AAD is not necessarily high, excessive caution and a delay in t-PA treatment with emergency stroke is also a problem. Ultrasound examination of all stroke patients is a method of reliably assessing dissection, but it is difficult to implement in actual clinical practice. As a practical measure, when patients have signs indicating AAD, carotid ultrasonography should be conducted before the use of t-PA in cases in which it is indicated. A diagnosis can be reliably made with findings of obstruction or a flap in the common carotid artery on ultrasound examination. Consequently, for hospitals that deal with urgent diseases, ultrasound technology (echocardiography and vascular ultrasonography by physicians and technologists) is essential.

References