Painless Aortic Dissection with Initial Symptom of Right Upper Extremity Weakness: A Case Report

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Thoracic aortic dissection is a dangerous disease. It usually presents as severe chest or back pain. Symptoms resulting from aortic branch involvement may also be involved. Sometimes, it presents with atypical symptoms. Here, we report a patient who came to the emergency department (ED) because of acute onset of right upper limb weakness and numbness. Brain computed tomography (CT) was performed initially because cerebral vascular disease was suspected. Subsequently, angiography was performed as artery occlusion of the limb was found. The patient suddenly collapsed in the ED. Stanford type A acute aortic dissection was found by chest CT.

Key Words: aortic dissection, painless, paralysis, thoracic aorta
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Thoracic aortic dissection may have variable presentations. The typical presentation is severe chest pain radiating to the back. Sometimes, it presents with symptoms other than pain. It is a challenge to the emergency physician to identify such a fatal disease when it presents with uncommon symptoms. We report a patient who came to our emergency department (ED) with acute onset of right upper arm weakness and numbness. Regrettably, the patient died in the hospital as the aortic dissection ruptured into the pericardium.

Case Presentation

A 77-year-old male came to the ED with acute onset of right upper limb weakness and numbness. These symptoms were noted when he woke up at midnight and he came to our ED within 1 hour. No other symptoms were noted.

Past medical history revealed diabetes mellitus and hypertension. He had regular medical control for these chronic diseases. On arrival, the vital signs were respiratory rate 15 breaths/minute, pulse rate 52 beats/minute, blood pressure 140/81 mmHg, and body temperature 36.9°C. The right upper limb could not be elevated and sensation of the right upper limb was defective. Laboratory examination included a complete blood count, blood glucose, blood urea nitrogen, creatinine, aspartate aminotransferase, alanine aminotransferase, sodium, potassium, prothrombin time, and partial thromboplastin time. All these results were normal. Brain computed tomography (CT) was performed and no obvious abnormality was found. Chest X-ray showed tortuous aorta (Figure 1).

A neurologist was consulted; however, cerebral vascular disease was not favored after a neurologic examination. Nevertheless, the right upper limb was pale and radial pulse was impalpable. Peripheral artery occlusion disease was suspected, so angiography

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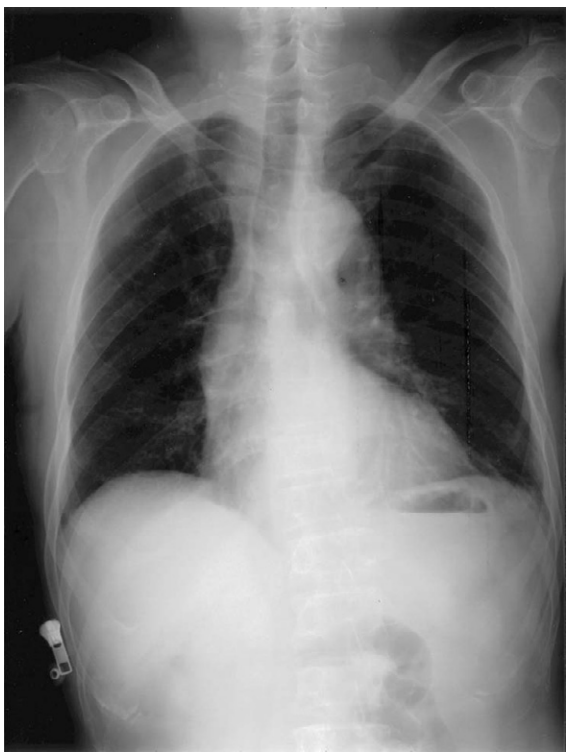

Figure 1. *Chest radiograph shows tortuous aorta without specific finding of aortic dissection.*

was performed. This showed failure of the brachiocephalic trunk filling and thrombosis was suspected (Figure 2) initially, although aortic dissection was determined by accurate diagnosis later. Thrombectomy was suggested.

Subsequently, a cardiovascular surgeon was consulted, but before his arrival, the patient lost consciousness. Cardiac arrest was noted and cardiopulmonary resuscitation (CPR) was performed. Electrocardiography revealed a slow narrow QRS rhythm without a palpable pulse. Asystole was noted after CPR for 3–4 minutes. Bedside echo revealed pericardial effusion. Pericardiocentesis was performed and blood was taken. Chest CT was performed after 30 minutes of CPR and showed aortic dissection with pericardial effusion (Figure 3). The patient died due to aortic dissection rupture into the pericardium.

Discussion

Pain is the most common presenting symptom of aortic dissection. According to a report from the International Registry of Acute Aortic Dissection, 95% of patients have reported pain [1]. Patients with aortic dissection may exhibit signs and symptoms secondary to organ system involvement [2]. The mechanisms of organ system involvement include: (1) the development of ischemia caused by the obstruction of branch arteries originating from the aorta; (2) the direct compression of a surrounding organ by the expansion of false lumen of the dissection; and (3) a leak or rupture of the dissection. Neurologic deficits have been associated with 18–30% of cases of aortic dissection [3]. Stroke, spinal cord involvement, or peripheral nerve involvement may be associated with aortic dissection. Limb artery occlusion may also result in limb weakness. Careful physical and neurologic examinations could differentiate vessel occlusion from neurologic defect.

Most of the symptoms of neurologic involvement present with pain, but there are a few reports in the literature in which various neurologic symptoms without pain were the initial presenting features of the aortic dissection. Koushima et al reported a case of painless Stanford type A acute aortic dissection with the only complaints being numbness and paleness in the right arm, similar to our case [4]. The case was initially treated under the diagnosis of acute occlusion of the right subclavian artery. Painless aortic dissection would present as other kinds of limb neurologic involvement. Holloway et al reported a patient with a painless aortic dissection whose neurologic symptoms progressed over 5 days to a complete transverse myelopathy [5]. Beach and Manthey described the first reported case of an acute thoracic aortic dissection that presented with the chief complaint of unilateral lower extremity numbness [6]. Pathophysiology may result from peripheral ischemic neuropathy. Painless aortic dissection presenting as paraplegia has been reported in several case reports [7–11]. During aortic dissection, obstruction of spinal arteries may result in paraplegia. As the painless aortic dissection involves dissection of the innominate artery, common carotid arteries, acute stroke symptoms may be noted [12,13]. Each side of the cerebrum could be involved, so right or left side hemiplegia could be noted. Highly unusual presentations of aortic dissection with acute ischemic stroke exist. Some physical examination findings such as asymmetric pulses or asymmetric blood pressure measurements of the extremities and carotid bruits may suggest the possibility of aortic dissection. Plain chest X-ray may also provide a clue. A wide mediastinum

Figure 2. *(A) Aortography shows no fill of the brachiocephalic trunk, so thromboembolism is suspected at first. (B) However, splitting of the contrast column, failure of major vessels to fill, and flow stasis disclosed the aortic dissection.*

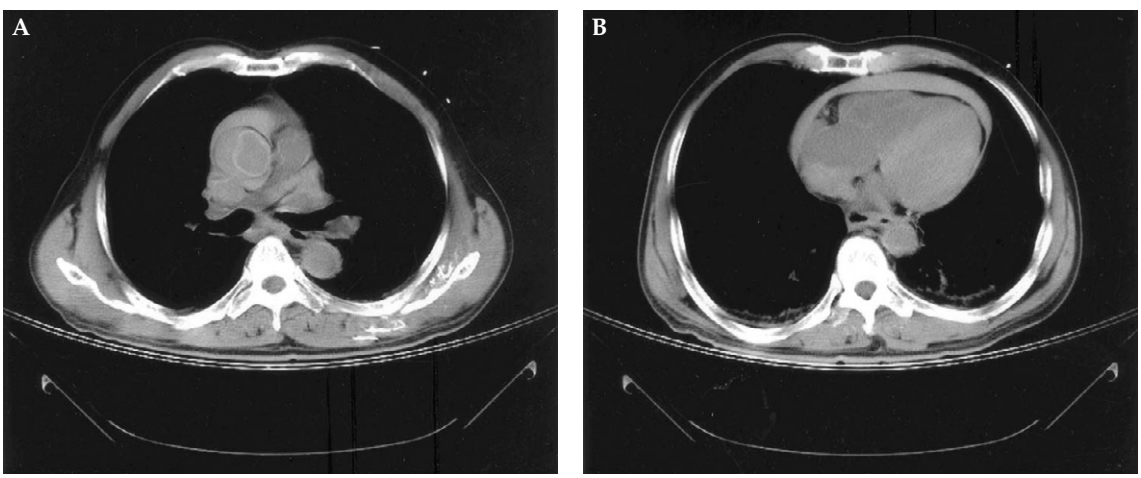

Figure 3. *Chest computed tomography shows: (A) intima flap; (B) hemopericardium.*

on plain chest X-ray was present in the cases that Morita et al reported [12]. Chest radiographic findings are abnormal in 80% of patients and are more commonly abnormal in ascending aortic dissections [1]. Radiographic findings in acute thoracic dissection include abnormal (i.e. blunted) aortic knob, ring sign (displacement of the aorta > 5 mm past the calcified aortic intima), left apical cap, tracheal deviation, depression of left main stem bronchus, esophageal deviation, loss of the paratracheal stripe, and hemothorax. The International Registry for Aortic Dissection revealed that over 12% of the chest radiographs of patients with aortic dissection were read as normal. The chest radiograph of our patient showed a tortuous aorta. Chest radiograph should be a routine examination in acute stroke symptoms. Physicians should be reminded of careful chest X-ray reading for the unusual presentation of aortic dissection with acute ischemic stroke. When the symptoms may result from the obstruction of branch arteries originating from the aorta such as right arm numbness from right subclavian artery occlusion, paraplegia from spinal artery occlusion, acute stroke symptoms from carotid artery or innominate artery occlusion, acute aortic dissection should always be considered as a differential diagnosis.

Aortography is a tool to detect aortic dissection. It has a sensitivity of 86–88% and a specificity of 75–94% for the diagnosis of thoracic aortic dissection [14–17]. The aortographic findings seen in patients with aortic dissection include the splitting or distortion of the contrast column, flow reversal or stasis, altered flow pattern, the failure of major vessels to fill, and aortic valve insufficiency. Our patient revealed a typical finding of aortic dissection, but delay of diagnosis still regrettably occurred.

Chest CT is the preferred initial diagnostic test because it is less invasive and allows rapid diagnosis in emergencies [18]. The intima flap, contrast difference in false and true lumen could be found. Complications such as hemopericardium, dissection aneurysm, and major aortic branch occlusion may also be found by CT. The final chest CT examination of our patient had the typical finding of aortic dissection.

Acute aortic dissection should be included in the differential diagnosis of limb arterial occlusion, even if there is no chest pain. Sudden onset of limb weakness may result from vessel occlusion other than cerebral vascular disease, and careful physical and neurologic examinations should be able to differentiate between them. Some physical examination findings and a chest X-ray may be the only clues for early suspicion of painless aortic dissection. Clinical suspicion of aortic dissection is the critical step to diagnosis. Delay in diagnosis and management may be fatal.

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無痛性主動脈剝離以右上肢無力為表現 — 病歷報告

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胸主動脈剝離是一種危險的疾病，通常會產生有嚴重的胸痛或背痛，並有一些症狀是由於主動脈的分枝受到影響而產生。有時其會以不典型的症狀來表現。我們在這裡要報告一位病人，一開始是以突發的右上肢無力來到急診，一開始懷疑腦血管疾病安排腦部電腦斷層，之後又懷疑肢體動脈阻塞安排血管攝影，病患突然在急診失去生命跡象，最後胸部電腦斷層診斷出胸部主動脈剝離。

關鍵詞： 主動脈剝離，無痛性，麻痺，胸主動脈

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