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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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 palpable. Peripheral artery occlusion disease was suspected, so angiography
was performed. This showed failure of the brachio-
cephalic 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 cardio-
pulmonary 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 pericar-
dial 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 aor-
tic dissection. According to a report from the Inter-
national 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 develop-
ment of ischemia caused by the obstruction of branch
arteries originating from the aorta; (2) the direct com-
pression 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 asso-
ciated 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 weak-
ness. 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 with-
out 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 dissec-
tion would present as other kinds of limb neurologic
involvement. Holloway et al reported a patient with
a painless aortic dissection whose neurologic symp-
toms 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 1.** Chest radiograph shows tortuous aorta without specific finding of aortic dissection.
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.

REFERENCES

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
由於主動脈的分支受到影響而產生。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，麻痹，胸主動脈

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