



## Case Report

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# Right Lower Extremity Numbness- an Atypical Presentation of Acute Aortic Dissection

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**Running Title** Atypical Presentation of Acute Aortic Dissection

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**ABSTRACT**

Acute aortic dissection (AAD) is one of the most challenging and emergency conditions in the health care system. It's associated with high mortality. A 55-year-old person was admitted to the emergency department due to numbness of his right leg. The patient had no complaints of chest pain on arrival. However, echocardiography revealed aortic dissection and computed tomography (CT) scan confirmed the diagnosis. The patient was immediately referred to Rajaei hospital for further specialized procedures. He went into the operating room directly and had a successful operation of aortic dissection repair. Rarely AAD has atypical manifestation and may have unusual clinical presentations. Thus, it could cause a delay in establishment of diagnosis of this emergent condition. The purpose of this report was to introduce a rare initial presentation of an atypical aortic dissection.

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## Introduction

**A**cute aortic dissection is one of the most challenging and emergency conditions in the health care system, and it was first described more than 225 years ago. (1) Aortic dissection is classified into two types based on its location and onset. Stanford Type A is aortic dissection that involves ascending aorta and Stanford type 2 dissection takes place at the distal section of the left subclavian artery. (2) The classic clinical scenario of aortic dissection is sharp chest or back pain with deterioration in the hemodynamic state. (3) Common clinical presentations of aortic dissection are congestive heart failure, syncope, cerebrovascular accidents, shock, paraplegia, and lower extremity ischemia (4). Aortic dissection may have atypical symptoms that could cause delayed diagnosis. Some patients may have painless aortic dissection (5, 6). All health care providers need high clinical suspicion to save these patients. In this report, we discuss a rare manifestation of painless aortic dissection presented by lower extremity numbness.

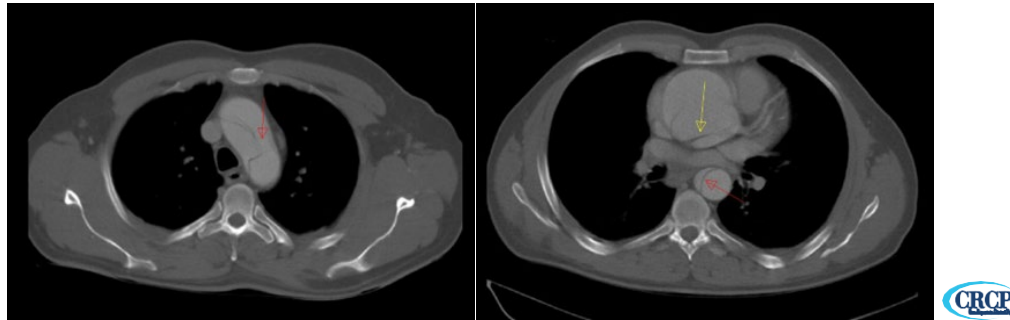
## Case Presentation

A 55-year-old male with a history of hypertension represented to the emergency department with numbness in his right leg. The numbness started the same morning when he was driving. The numbness had a progressive pattern. The patient denied chest, abdomen, or back pain. He reported a vague history of mild hypertension and didn't take any medication. He was smoking 20 cigarettes a day for many years. Upon arrival, vital signs were blood pressure of 135/74 mmHg, heart rate of 88 bpm, respiratory rate of 15 breaths per minute, body temperature of 96.80F, and oxygen saturation was 97% in room air. Physical examination of the head, eyes, and nose had no pathologic findings. Lung auscultations were vesicular and heart auscultation revealed an S1S2 rhythm without any additional sounds. Abdominal examination showed no distension, tenderness, or organomegaly. Examination of extremities was unremarkable except for the right foot. It showed decreased pinprick and light sensation and its force was 2/5.

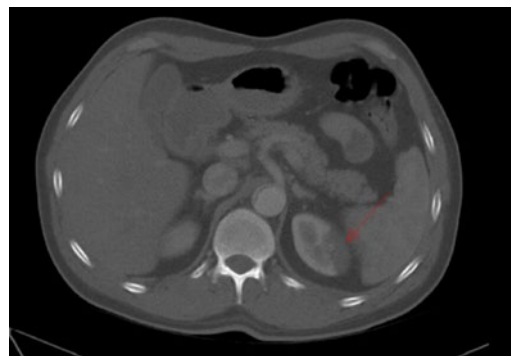
Laboratory findings showed a red blood cell count of  $5.36 \times 10^6$ , white blood count of  $21800/\mu\text{l}$ , hemoglobin

11.2 gm/dl, MCV 62.9/fL, platelet  $233000/\mu\text{l}$ , creatinine 1.5 mg/dl (baseline creatinine was 0.8- 1.4 mg/dl) and troponin I 12.30 ng/L. Also an elevated D-dimer (3410 ng/ml, positive:  $>500\text{ng/ml}$ ) was detected. Serum electrolytes were in normal limit (Na: 144mmol/L, K: 4.7mmol/L, Mg: 2.7mmol/L). Biochemistry analyses were conclusive and liver function studies were normal. Doppler ultrasonography of the right foot was done to evaluate arteries and possible obstruction. Electrocardiogram (EKG) was normal. According to these findings, a diagnosis of radiculopathy was made. Approximately 7 hours later, the patient experienced pain in his right lower extremity. The pain started in the hip region and rapidly progressed to the distal region. Progressive chest pain developed very fast. This clinical scenario happened over several hours. Vital signs were recorded and demonstrated a blood pressure of 164/65 mmHg on the right hand, 179/65 mmHg on the left hand, 144/77 mmHg on the left foot, and blood pressure of 80/50 mmHg on the right foot, heart rate of 88 bpm, and respiratory rate of 18 breath/minute. The involved foot had weak pulses and emergent Echocardiography revealed severe left ventricle systolic dysfunction which left ventricle ejection fraction was 30%, moderate aortic regurgitation with dilated aortic root, and ascending aorta (6cm).

Computed tomography angiography showed dilatation of the aortic root, ascending aorta, and aortic arch. An intimal flap was seen that extended from the aortic root to below the origin of the renal arteries distally (Figure 1). It divided the aortic lumen into true and false lumens. Involvement of the right brachiocephalic artery, left common carotid artery, and left subclavian artery was also noted. Evidence of non-enhancement of the upper pole of the left kidney indicated an infarction (Figure 2). The patient has been referred to Rajaei hospital (a tertiary center) without any hesitancy. He went into the operating room directly and had a successful operation of aortic dissection. He currently has a normal and healthy life.



**Figure 1.** Non-contrast enhanced axial sections revealing intimal flap extended from the aortic root to below the origin of the renal arteries.



**Figure 2.** Infarction of the upper pole of the left kidney showed in non-contrast enhanced axial section.

## Discussion

One of the catastrophic clinical states is aortic dissection and it's defined as a separation of the aortic wall layers. The mechanism of aortic dissection is a tear in the aortic intima that could progress retrograde or antegrade and make more damage. This event produces a false lumen that could advance proximally to the heart or distally to the descending aorta and compresses the aortic lumen and other arteries divided from the aorta. The most common manifestation of aortic dissection is a severe acute chest pain often described as a tearing, ripping, or sharp sensation that radiates to the back. More than half of aortic dissections (about 65%) occur in the ascending aorta, twenty percent involve the proximal descending aorta, ten percent involve the aortic arch and others may occur in the distal descending aorta. (7-9)

Aortic dissections are classified based on their location and time of onset. Involvement of descending aorta called Stanford type A and dissections that occur distal to the subclavian artery are named Stanford type B. (2) Sometimes, the classical presentation of AD may not be present. Anterior chest pain and other uncommon symptom like exertional dyspnea or orthopnea are dominant manifests in type A aortic dissection. But Type B

aortic dissection routinely presents with back pain. (8, 10) Clinical presentation of aortic dissection remarkably relies on the pattern of the vessel involved. All physicians, even experienced ones, may diagnose other diseases at first. Due to high mortality rate of type A (about 1% per hour for the initial 48 hours), surgical intervention should be performed as soon as possible but type B is often treated by blood pressure control. (11)

In the general population, acute aortic dissection's incidence is about 2.6 to 3.5 per 100000 each year. (12) Risk factors for aortic dissection include advancing age, hypertension, smoking, diabetes mellitus, renal failure and atherosclerosis. (10, 13) A study showed the most common risk factor in type B dissections was hypertension. (14) On the other hand, about 10% of patients who had aortic dissection may have atypical symptoms and not have chest pain. (15) Other clinical manifestations include cardiac tamponed, aortic regurgitation, and end-organ ischemia. (8) Studying 236 patients in a large study at a referral center demonstrated 38 % of patients were missed at first and 28% of patients were diagnosed with aortic dissection on postmortem examination. (3) All of this information demonstrates the importance of having a high index of clinical suspicion in high-risk patients.

Some studies demonstrated patients who had controlled hypertension with antihypertensive agents had better outcomes and prognosis after surgery. Whereas patients with normal or low blood pressure who were not receiving antihypertensive drugs had the worst survival. The efficiency of beta-blockers in these cases is controversial while the protective role of nitrates has been approved due to its effect on lowering the contractility of the left ventricle. (16, 17)

Imaging techniques that can help diagnose aortic dissection include CT-scan with contrast, magnetic resonance imaging (MRI), trans-esophageal echocardiography (TEE), and angiography. CT scan is widely applied due to its high sensitivity, specificity and availability. The highest specificity and sensitivity is achieved via MRI but it's less available than other methods. TEE is used for hemodynamically unstable patients. (18)

Numbness could be a rare sign of aortic dissections because peripheral nerves have a better blood supply and less metabolic needs than muscular tissues. (19) Painless aortic dissection could be represented by neurological sequelae. According to the dissection site, neurological sequelae may be caused by peripheral ischemic neuropathy, spinal cord ischemia, and cerebral ischemia. Involvement of iliac arteries may cause peripheral neuropathy. (20)

## Ethical Considerations

### Compliance with ethical guidelines

All activities elucidated in the current investigation were carried out in adherence to ethical principles. The patient provided informed consent for the disclosure of their anonymous data in this manuscript.

Research Ethics Committees of Qom University of Medical Sciences approved this study: IR.MUQ.REC.1401.041

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### Conflict of interest

The authors declared no conflict of interest.

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None

## Conclusion

Our patient's manifestation is an example of an uncommon presentation of aortic dissection on arrival. Clinical scenarios like this cause delay in establishing the correct diagnosis. Any delay could cause irreversible consequences. Our case presented initially with numbness of the right lower extremity. A physical exam revealed hypertension, and the patient was not aware of it. Laboratory data showed anemia, raised creatinine, and elevated D-dimer. Echocardiography showed left ventricle dysfunction and dilated root of the aorta and descending aorta. CT scan demonstrated a Type A aortic dissection. It seems, uncontrolled hypertension and smoking were two important risk factors for this patient. This case indicates all physicians should be aware of atypical symptoms of acute aortic dissection and consider it in their differential diagnosis.

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