

Aortic Dissection Secondary to Maguo Ingestion

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Abstract

Aortic dissection is a rare known complication of taking Maguo (main ingredient is methamphetamine). To date there have been 0 case report of its occurrence. The suspected pathophysiology is transient severe elevation in blood pressure, causing a shear force on the thoracic aorta. For the first time, we report a case of aortic dissection secondary to Maguo ingestion with an unusual presentation.

Keywords: Aortic dissection; Maguo; Methamphetamine

Case Presentment

A 24-year-old female without significant medical history presented to the emergency department complaining of persistent upper back and chest pain within 8 hours. The patient had not experienced this type of pain before. The patient denied previous cardiac history, intravenous drug use, human immunodeficiency HIV infection, history of pregnancy, or other recent illness. She admitted that long-term use of Maguo (main ingredient is methamphetamine) within 6 years, and had been taking it prior to symptoms appearing as headache, vertigo and palpitation, and had no significant family history of medical disease. On physical examination, blood pressure was 126/86 mm Hg on the right arm and 120/74 mm Hg on the left arm; left lower limb had a blood pressure of 130/78 mm Hg and right lower limb had a blood pressure of 128/80 mm Hg, heart rate was 101 bpm and a SO_2 of 98%. Neck inspection and palpation revealed a normal thyroid gland and no masses or enlarged lymph nodes. Cardiopulmonary examination found no positive results. Laboratory results were as follows: D - dimer 3.46 $\mu\text{g/ml}$ (reference range, 0 to 0.25 μg per milliliter); troponin I 0.05 ng/mL (reference range, 0 to 0.04 ng per milliliter); routine blood: WBC count $14.37 \times 10^9/\text{L}$, neutrophil 0.80, hemoglobin 93.3 g/L, platelet count $712.9 \times 10^9/\text{L}$; inflammatory factor: high-sensitivity c-reactive protein (hsCRP) 18.23 mg/L, erythrocyte sedimentation rate 28 mm/h; liver function and renal function tests were within normal ranges; women rheumatism immunological indexes were normal. An electrocardiogram showed sinus tachycardia without acute ischemia (Figure 1). Chest radiograph revealed mediastinal, aorta and lung fields were normal. Echocardiogram was performed with technical difficulty due to patient's body habitus, revealing heart mild enlargement and valve are normal, with an ejection fraction of 52%. Thoracoabdominal CT angiography was performed because of an aortic dissection suspicion. CTA showed a dissection (Stanford B) in the descending thoracic aortic arch (Figure 2). Ultimately, the patient was executed to endovascular repair of aortic dissection. She was discharged to home 7 days after her presentation.

Maguo is Thai transliteration, which main composition is methamphetamine, is a kind of methamphetamine tablets after processing, appearance similar to ecstasy and amphetamines doping, the experimental ingredients containing methyl amphetamine and caffeine (Figure 3). After treatment can make the person extremely excited central nervous system, blood system, to a large number of exhausted strength and immune function [1]. In toxic doses, methamphetamine induces unpleasant CNS symptoms such as agitation, anxiety, hallucinations, delirium, and seizures; death can occur [2]. Cardiovascular symptoms such as chest pain, palpitations,

or dyspnea can also develop [3]. Many antihypertensive agents and β -blockers are effective in reversing methamphetamine-induced cardiovascular symptoms. For treating an amphetamine-induced hypertensive crisis, agents such as phentolamine or nitroprusside provide efficacy. Blood pressures may also respond indirectly to the sedating effects of haloperidol. Calcium channel blockers have been used successfully in some emergency departments [4].

The conditions of aortic dissection includes that contribute to medial degeneration and those that increase aortic wall stress. Conditions associated with medial degeneration include Marfan syndrome, Loeys-Dietz syndrome, the vascular form of Ehlers-Danlos syndrome, inflammatory diseases of the aorta, Turner syndrome, bicuspid aortic valve, and familial thoracic aortic aneurysm and dissection syndrome [5]. The most common condition that increases wall stress is hypertension, present in more than two-thirds of patients with aortic dissection. Other conditions implicated in dissection are likely mediated by hypertension, including pheochromocytoma, cocaine use, and coarctation [6]. Physical trauma can increase wall

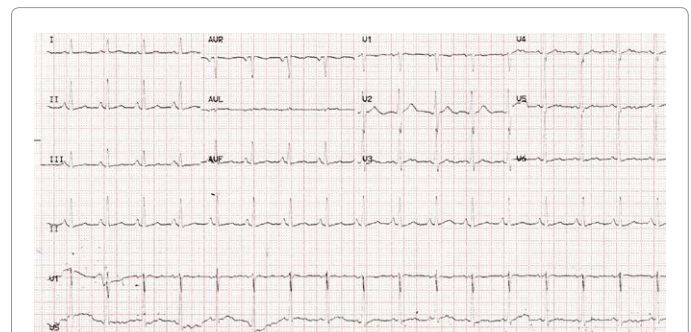


Figure 1: Electrocardiography performed on arrival revealed sinus tachycardia without acute ischemia.

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Figure 2: CTA showed a dissection (Stanford B) in the descending thoracic aortic arch.



Figure 3: Maguo is Thai transliteration, which main composition is methamphetamine, is a kind of methamphetamine tablets after processing, appearance similar to ecstasy and amphetamines doping.

stress and cause dissection, as in weightlifting, deceleration injury in motor vehicle accidents, or falls [7,8].

Methamphetamine-induced cardiovascular pathology is the result of its sympathomimetic effect on the heart and peripheral vasculature, causing both increased inotropic and chronotropic activity and an increase in peripheral vascular resistance [9]. Methamphetamine-

induced elevation of arterial blood pressure and the increased afterload secondary to peripheral vasoconstriction combine to cause a sharp increase in the wall stress at the aortic intimal level, thus predisposing a patient to aortic dissection. Furthermore, the increase of the pulse wave (or dp/dt) will facilitate progression of the dissection once it is started [10].

Our patient was 24 years old and without a history of hypertension or other predisposing factors to aortic dissection. To date there have been 0 case report of Methamphetamine-induced aortic dissection. Emergency physicians should remain vigilant for its presence as the abuse of Maguo ingestion in our society continues.

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