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Aortic Dissection of Unknown Origin in a Young Patient: A Case Report

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ABSTRACT

Aortic dissection occurs when a tear develops in the wall of the aorta, which is rare in the young population. This fatal disorder is hard to diagnose, especially in young patients. We present the case of aortic dissection in a 15-year-old boy referred to the Emergency Department of Yazd University of Medical Sciences in November 2015. The patient presented to our department with sudden acute chest pain. Emergent computed tomography (CT) scanning of the brain, chest, and abdomen reflected bilateral pleural effusion, biluminal aorta, arterial flap in the upper part of the abdominal aorta, and dilated small bowl loop. The patient did not have any aortic dissection risk factors such as history of connective tissue disease, congenital heart disease, coarctation of the aorta, and hypertension. The only noticeable point in the patient's history was swimming two hours before the onset of the chest pain. Aortic dissection is a rare differential diagnosis in children with acute sudden chest pain.

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Introduction

Aortic dissection is secondary to damage or tear in the wall of the aorta (1). Aortic dissection is not relatively common, but it most frequently occurs in 60 to 70-year-old males. Incidence of the thoracic aortic dissection is 3–4 cases per 100,000 persons per year (2). Sometimes, this fatal disorder is misdiagnosed, especially in young patients; therefore, true incidence rate of this disorder is underestimated (3).

Major risk factors for aortic dissection are uncontrolled hypertension, atherosclerosis, weakened and bulging artery, aortic valve defect, and coarctation of the aorta. Aortic dissection is rare in the pediatric population (4); in this study, we present the case of a 15-year-old boy presenting to the Emergency Department of Yazd University of Medical Sciences, Iran.

Case Report

The patient was a 15-year-old boy with acute and sharp chest pain initiated about two hours before hospital admission, while swimming in a public pool. He described a sudden retrosternal and epigastric pain with radiation to the back. After a few seconds, his pain migrated to periumbilical region. The patient's past medical, familial, and drug history was unremarkable.

At admission, the patient looked ill, with a heart rate of 130 bpm, initial blood pressure of 125/80 mmHg in both hands, respiratory rate of 30 bpm, and 38.1˚C body temperature. Laboratory test results for this patient showed hemoglobin level of 12.9 g/dL, white blood cell count of 17,800/µl, and platelet count of 241,000/µl; serum electrolytes, including Na^{+}, K^{+}, and Ca^{++} were normal. Liver function test was minimally higher than the normal range, indicating a normal amylase level. Electrocardiogram demonstrated a normal sinus rate without any abnormal changes.

Then, emergent computed tomography (CT) scan of the brain, chest, and abdomen was performed, which showed bilateral pleural effusion (dominantly on the left hemithorax) with biluminal aorta and dilated small bowel loops (Figures 1 and 2). CT scan showed an arterial flap in the upper part of the abdominal aorta (Figure 3). Due to severe

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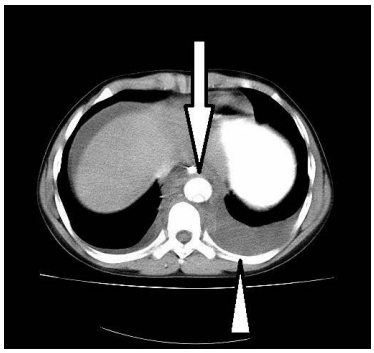

Figure 1. The arrow shows double lumens of descending aorta and arrow-head shows the effusion of thorax mainly on the left side

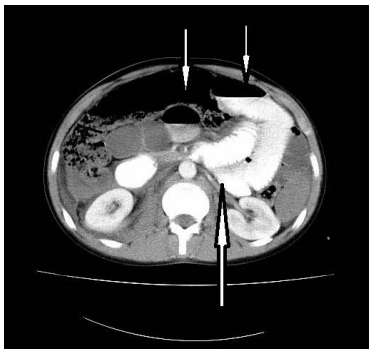

Figure 2. The arrows show significant landmarks of bowel obstruction

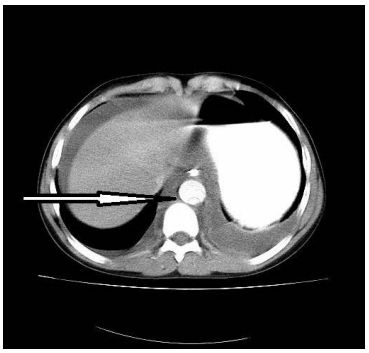

Figure 3. The next cut of computed tomography scan showing aortic wall flap

abdominal pain and dilated small bowl loop in the CT scan, diagnostic laparotomy was carried out; during surgery, ischemic blackish small-bowel loop was noticed. The patient died due to cardiac arrest.

Discussion

The incidence of aortic dissection is rare in young patients. In 2009, Fikar et al. reviewed more than 1000 aortic dissection patients 3.5% of whom were aged under 19 years old (5). Major risk factors for aortic dissection are hypertension, connective tissue disease, congenital heart disease, severe chest trauma, and genetic defect in fibrin production (4).

Through studying the medical records of our patient, we found no personal or familial history of connective tissue disease such as Ehlers-Danlos, Marfan, or Turner syndromes, or consumption of any drugs causing connective tissue disturbance. In addition, there were no symptoms or history of congenital heart disease such as bicuspid aortic valve, coarctation of the aorta, and hypertension. The only point in the patient's history was diving in a pool about two hours before the onset of the chest pain.

In cases of aortic dissection, the main finding is abdominal pain immediately after the onset of severe chest pain. In the previous studies, similar to our patient, the first symptom was acute and severe knife-like chest pain with changing position over the time (3, 6, 7). Ayrik et al. and Nadour et al. reported cases of painless aortic dissection (8, 9). Ngan et al. reported a case of aortic dissection in a 17-year-old male patient, without any known risk factors. Their patient had acute abdominal pain and retroperitoneal hematoma, and died two days after admission (10).

In aortic dissection, extension of hematoma or flap commonly results in obstruction of the renal (8%), mesenteric (8-13%), and cerebral arteries. Based on the involved vessel, the signs and symptoms (e.g., azotemia and oliguria in the involved renal artery, abdominal pain and hematochezia in the involved mesenteric artery, and neurological defect in the involved cerebral artery) can be different (7).

Intravenous contrast CT scan is the gold standard for diagnosis in emergency patients, although magnetic resonance imaging (MRI) and Transesophageal Echocardiography (TEE) can be useful in stable patients, as well (7). In our case, abdominal pain was one of the major complaints; therefore, abdominal CT scan was performed.

Generally, in aortic dissection, treatment is based on reduction of hydrodynamic pressure and heart beat energy through administering beta and calcium channel blockers, pain relief, and surgical methods for tissue regeneration such as endovascular stent grafting (11). The extension of vascular involvement and the interval between dissection and the onset of treatment can affect the rate of mortality. In the early hours, the rate of mortality increases 1-3%/hour from symptom to treatment onset, which increases to 25%/hour after 24 hours.

In our patient, the extension of artery involvement was not justified by trauma, and another unknown etiology such as fibrinogen deficiency might be involved. In management of complicated dissections with inadequate perfusion in aortic branches, emergent endovascular stent grafting is recommended (7).

Conclusion

According to this case, aortic dissection is an important differential diagnosis in children with acute chest pain, which is hard to diagnose. We should always keep in mind that this fatal disorder is a possible diagnosis even in the young peoples without known risk factors. The early recognition and rapid treatment is lifesaving.

Conflicts of Interest

None declared.

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