

# A Rare Diagnosis After a Traffic Accident

## Aortic Transection

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### Abstract

Traumatic aortic transection is mostly seen in blunt injury and associated with motor vehicle accidents. 80%-85% of the patients with the aortic transection die at the scene of the incident and the rest of the patients who is delivered to the hospital, have 20% mortality rate. Even with the endovascular repair, these patients have considerably high mortality. On the other hand the diagnosis and the prognosis of aortic transection has been continuously improving. Furthermore the treatment requires a combination of pharmacological and surgical techniques and the endovascular treatment playing a very important role in definitive repair. In this report we present a patient who is admitted to the ER after an in-vehicle car accident. The chest computerised tomography (CT) showed a pseudo aneurysm, measuring approximately 30 mm, in the proximal part of the descending aorta and an appearance consistent with hematoma, measuring approximately 30 mm, and aortic transection was considered. The possibility of aortic injury should always be considered in cases admitted to hospital due to trauma, and if there is any suspicion, necessary examinations should be performed also cardiovascular surgeon should be consulted immediately.

**Keywords:** Blunt trauma, aortic transection, traffic accident.

### Introduction

Aortic transection after blunt traumatic injury is a very rare condition observed in the clinical practice and has a high risk of mortality and morbidity<sup>1</sup>. The underlying mechanism is a tear or damage to the aortic wall due to rapid deceleration of the body with the effect of hitting a solid object<sup>2</sup>. These cases are mostly spotted in car accidents and approximately 80-85% of cases lose their lives at the scene<sup>3</sup>. The location of injury is the aortic isthmus in approximately 85% of patients<sup>1</sup>.

In this article, a case of aortic transection diagnosed in a patient with multiple trauma due to a traffic collision was presented.

### Case Report

An 18-year-old male patient was admitted to the emergency department by the 112-emergency medical service ambulance due to a traffic collision. The patient had facial bleeding, pain in the midline of the chest, dyspnea, diffuse abdominal pain, right pelvic pain and left knee pain. There were no specific characteristic in the patient's history.

In the physical examination, the patient was conscious, oriented and cooperative, and the Glasgow Coma Score (GCS) was 15. Arterial Blood Pressure was 100/60 mmHg, the heart rate was 73 beats/min, the respiratory rate was 16/min and oxygen saturation was 99%. In the head and neck examination, a linear incision, measuring 6-7 cm was noted on the left side of the forehead. In the thoracic examination, the respiratory sounds were normal and no rhonchus or rale was heard. The first heart sound (S1) and second heart sound (S2) were rhythmic, and no additional sound or murmur was detected. No pathology was detected during the examination of the patient, who stated that he had sternum pain. In the abdominal examination, there was tenderness in the right upper quadrant; however, no rebound or defence was noted. In the extremities, the peripheral pulses were palpable, tenderness was detected on the right hip and on the distal end of left femur. Since the patient was exposed to high-energy trauma, cranial, cervical, thoracic and abdominal CT imaging were requested. Moreover, while the patient was being prepared for tomography, bedside chest radiograph, anterior-posterior pelvis radiography and bilateral radiographs of both femur with portable direct radiography were requested. The chest radiograph showed mediastinal widening (Figure-1), and antero-posterior pelvic radiograph demonstrated fracture on right femoral neck, and left femur

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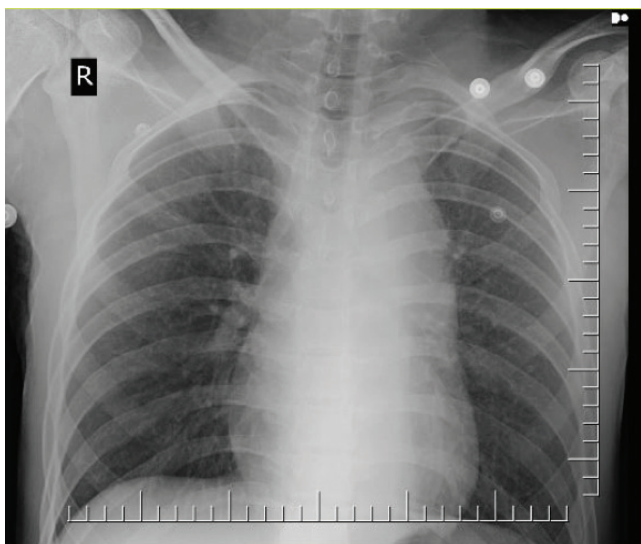
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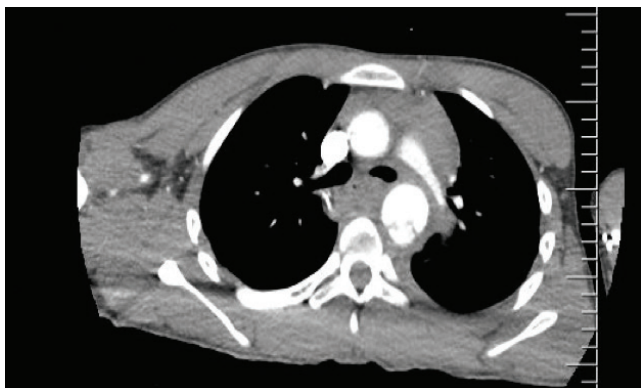
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**Figure 1.** Antero-posterior Chest Radiograph; the axial sections of thoracic computerised tomography showed hematoma around the aorta and transection line.



**Figure 2.** Thoracic CT showed hematoma around the aorta and transection line; the axial sections of thoracic computerised tomography showed hematoma around the aorta and transection line.

radiograph showed fracture in the distal femur. The chest CT showed a pseudoaneurysm, measuring approximately 30 mm, in the proximal part of the descending aorta and an appearance consistent with hematoma, measuring approximately 30 mm, and aortic transection was considered (Figure-2). The abdominal CT demonstrated an image compatible with hematoma, measuring 30 mm in its thickest section, in the paraaortic region, extending to the level of renal artery (Figure-3). In liver segment IV, a hypodense area, measuring 30 mm, consistent with laceration, and in left lower pole, a hypodense lesion and measuring 30x24mm, consistent with contusion were observed. The patient was transferred to the intensive care unit after being consulted with the relevant surgical branches (Figure-4). The patient underwent surgery in the orthopedic clinic for fractures of femur and underwent endovascular surgery for aortic injury and was discharged approximately in the postoperative 1st month.

## Discussion

There are many diseases in the differential diagnosis of patients admitted to the emergency department with blunt thoracic trauma. These diseases include cardiac tamponade, pneumothorax, hemothorax, major vessel injury, lung contusion, cardiac contusion and rib fractures<sup>4</sup>.

Traumatic aortic transection has a very high mortality rate. The autopsies have been performed, shows that traumatic aortic transection has been responsible for the %15 of the death sin blunt trauma. The localization of injury is usually in the aortic isthmus; however, it may be rarely observed on the abdominal aorta and distal thoracic aorta<sup>5</sup>. Approximately 80% of aortic transection cases due to trauma die at the scene. They rarely can reach a hospital<sup>6</sup>. This case was also admitted to the emergency ward due to blunt trauma, and the transection was located on the aortic isthmus.

Blunt trauma can affect many organ systems, especially the central nervous system. The patient can be unconscious



**Figure 3.** Hematoma around the abdominal aorta; the axial sections of thoracic computerised tomography showed hematoma around the aorta and transection line.



**Figure 4.** Hypodense lesion compatible with laceration in liver segment 4, and contusion observed in the left kidney; the axial sections of thoracic computerised tomography showed hematoma around the aorta and transection line.

or conscious at the admission. Patients with aortic transection may have chest pain spreading to the neck and back or may have no complaints(2). Other symptoms that may accompany include dyspnea, dysphagia, and extremity pain due to spinal ischemia. Chest radiography, one of the radiological images, may show findings, such as mediastinal widening, effacement in the aorta, and displacement of the trachea, even if it does not provide definite information for the diagnosis. Intravenous contrast-enhanced CT and echocardiography play an important role in diagnosis<sup>7</sup>.

A significant proportion of deaths due to aortic transection occur before reaching a hospital. Approximately 18% of the aortic transection cases die before they reach a hospital<sup>8</sup>. Mortality during open surgery can reach up to 23% in aortic transections due to trauma, depending on the condition of other concomitant traumatic disease<sup>9</sup>. In a study, the mortality rate in endovascular repair was found to be 8.6%<sup>8</sup>. There are clinical studies showing that significant reductions in mortality and morbidity rates were achieved in endovascular repair<sup>10</sup>. As this case had serious concomitant disease and was hemodynamically stable, endovascular repair was performed in department of cardiovascular surgery after intensive care follow-up and necessary preparations.

## Conclusion

Aortic transection due to blunt chest trauma has serious mortality and morbidity, and many patients pass away before reaching hospital. Therefore, it should be kept in mind as a differential diagnosis for patients who are exposed to multiple trauma. In case of a suspicion of aortic injury, clinical tests, such as computed tomography imaging and echocardiography, should be planned and a cardiovascular surgeon should be consulted.

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