

CASE REPORT

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Acute aortic transection caused by traffic accident: As a forensic case

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Abstract

Traffic accidents are one of the most common causes of blunt traumatic injuries and also significant causes of mortality and morbidity. To know injury patterns of traffic accidents will ensure early medical intervention and will reduce mortality and morbidity and also will facilitate the assessment of prevailing findings in criminal and compensation cases. In this case report, it was aimed to draw attention to the forensic subjects and the features of forensic cases via a 46-year-old male patient who had acute aortic transection due to traffic accidents.

Keywords: Traffic accident, injury patterns, aortic transection, mortality, morbidity

Introduction

Traffic accidents are one of the most common causes of blunt traumatic injuries and forensic incidents. Behind this, they are significant causes of mortality and morbidity. Blunt traumatic aortic injuries which most commonly occur in traffic accidents are life-threatening lesions [1,2]. It is reported that approximately 80% of patients with aortic injuries died at the scene and half of the remaining patients died within 24 hours if not intervened emergently [3]. So, to know injury patterns of traffic accidents will ensure early medical intervention and will reduce mortality and morbidity. In this case report, it was aimed to draw attention to the forensic subjects and the features of forensic cases via a 46-year-old male patient who had acute aortic transection due to traffic accidents.

Case Report

A 46-year-old male injured in traffic accident when his car collided on another one. On the same day he was brought to university hospital by an ambulance. On arrival, chest pain was the only complaint he stated. He was examined in Emergency Medicine Department, none of the findings noted was suggesting any pathology apart from mild hypotension. His complaints-oriented, contrast-enhanced thoraco-abdominal computed tomography

angiography (CTA) was performed. CT images revealed traumatic full layer transection of descending aorta and periaortic hematoma on same level as transection. Left atrium was partially pressed by hematoma. Additionally, displaced fracture of left sixth rib, non-displaced fracture of left seventh rib and atrophy of right kidney were noted. Therefore, emergency endovascular treatment was planned. All of the patient's laboratory findings were within reference values of university hospital.

When questioned for his medical history before operation, his history of 35 years of smoking and diagnosis of benign prostate hyperplasia were noted. There were no predisposing diseases suggesting aortic dissection such as hypertension, connective tissue diseases, underlying aortic malformations and so on. He was operated aiming repair of Type 3 aortic dissection the day after the accident. No endoleak was seen during postoperative angiography. Then he was taken to Intensive Care Unit, two units of erythrocyte suspension were replaced to him and after a night long stay there, he was transferred to Cardio-vascular Surgery Department. On the first postoperative day, he came up with intense bronchial secretion complaint and had fever at the same time; his medical treatment was regulated by Infectious Diseases Department. He was discharged on the eighth postoperative day, no complications were found on following examinations.

When questioned for the details of accident, the patient stated that he was driving the car when another car hit his one head on head. He was conscious, his seatbelt was fastened and airbags on his chest level were activated just after the crash. His length was measured 171 centimeters, and his weight was 84 kilograms.

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Discussion

Blunt aortic injuries are most commonly the result of traffic accidents [4]. Descending thoracic aorta as in this case, is the most frequent anatomic region of injury regardless of the mechanism, followed by multi-location injuries and aortic arch [2]. Aortic dissections caused by acute trauma have high risk of mortality [5]. 80% of aortic injuries die in the scene and half of the survivors die as well in following 24 hours if not treated urgently [2,3]. It is a critical issue to make a diagnosis of aortic dissection due to a traffic accident quickly and to make the treatment without losing time. Injury patterns and traffic accident's characteristics affect mortality and morbidity of the cases [6]. To know traffic accident's characteristics and injury patterns will ensure early medical intervention and will reduce its mortality and morbidity.

There is usually no specific physical examination finding in these cases [5]. In the present case, no specific symptom was noted, too. Mild hypotension and chest pain were the only findings on physical examination. However, as a result of the radiological examinations, the diagnosis was made quickly and the treatment was passed without loss of time. Studies show that the sensitivity and specificity of Thoracic Computerized Tomography, including the arterial phase, is nearly 100% for diagnosis. Also, transthoracic echocardiography, transesophageal echocardiography, digital subtraction angiography were recommended for diagnosis [7].

Today, security precautions in vehicles have been increased. Although, the installation of a belt in the vehicle and the presence of airbag systems may reduce injury and mortality rates due to traffic accidents, injuries can still result as aortic injuries as in this case report. In presented case, he was reported that his seatbelt was fasten and airbags on his chest level were activated just after the crush.

Conclusion

The injuries and deaths due to traffic accidents have an important place in forensic medicine applications. In cases of non-penetrating chest trauma, it should be kept in mind that vascular damages may have occurred even though signs and symptoms are not manifesting which makes questioning details and mechanism of trauma and meticulous physical examination vitally important.

Also, the development of medical algorithms for these kinds of

forensic cases where the risk of mortality and morbidity is high is important for against to medical malpractice claims.

Another important issue is that sometimes aortic rupture occurs spontaneously during the usage of the vehicle and then traffic accidents occur. Determining which one is the cause of another is crucial to criminal and compensation claims. For this reason, it is necessary for physicians to make an evaluation by taking this issue into consideration.

Apart from these, considering to improve designs of airbags and make them more ergonomic, to define safe intervals of chest-to-burst distances for various body types may be helpful to decrease thoracic aorta injuries caused by such accidents, however further studies are required to confirm these hypothesis.

Competing interests

The authors declare that they have no competing interest.

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

Ethics committee approval

While this study is a case report, there isn't any ethics committee approval. There is the case's informed consent form.

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