



## HEART INJURY WITH MULTI-TRAUMA IN A MALE PATIENT AND CASE MANAGEMENT

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### ABSTRACT

Occult cardiac injury may develop due to blunt, penetrating or iatrogenic causes. Cardiac injury lesions range from a simple myocardial contusion to critical cardiac rupture. We present a case and our approach to lung injury and right ventricle rupture of thoracic trauma which developed after falling from height on a job accident.

**Key words:** Heart Rupture, Trauma, Surgery.

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### INTRODUCTION

Approximately 25% of deaths related to trauma are due to thoracic trauma injuries. Thoracic trauma may develop due to blunt, penetrating or iatrogenic causes (1). Thorax blunt trauma usually occurs as a result of motor vehicle accidents, work accidents, falling down from highs and sports injuries (2, 3). Broad and diverse clinical presentations varying from electrocardiographic changes to sudden death due to wall rupture can be seen after trauma (3). We present our approach to a case of lung injury and right ventricle rupture of thoracic trauma which developed after falling from height on a job accident.

### Case Report

Fifty-one-year-old male patient was admitted to the emergency room after a work-related accident in the form of falling from six-meter height. His general condition was poor, and had confused consciousness.

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On admission arterial pressure was 60/40 mmHg, heart rate was 120/min and breathing was tachypnea. First-aid operations and heavy volume replacement was started. Open fractures were present in his right arm and left femur. Upon detection of multiple costal fractures on the right, hemothorax and air density in the pericardium on the left in thoracic computed tomography, tube thoracostomy was applied (Figure 1). The hemodynamically unstable patient who had 1500 cc hemorrhagic drainage was taken into operation with emergency thoracotomy for thoracic surgery. When thoracic cavity was accessed with left anterolateral thoracotomy, it is observed that the pericardium is open. In the exploration, in close proximity to outflow of right ventricular, rupture about 3 centimeters in length was observed. Patch was created by graft cutting on dacron due to not having teflon felt. Dacron patch is put on both sides of the wound for support and rupture field was repaired by interrupted suture in 'U' shape by 3/0 proline. Lacerations at the apex of the left lung and hilar region were repaired by the team of thoracic surgery. Two chest drains were placed. Reduction and splint

was applied to open fractures by orthopedics. Taken to intensive care, patient was extubated in the first postoperative day. In the control echocardiography, valvular pathology and wall motion abnormality was not detected. In postoperative third day and fourth day femur and humerus open fractures were treated respectively by using internal fixation technique under spinal anesthesia and then taken to the patient monitoring service. In the postoperative fifth day, chest drains were pulled. In the postoperative ninth day, control echocardiography and chest radiograph was repeated without detectable pathologies, and the patient is discharged.

**Figure 1. Hemothorax and air density are seen in the pericardium on the left in thoracic computed tomography.**



In blunt chest trauma, injuries to other organs such as lung contusion, costal fractures, head trauma may happen and cardiac injury may not be detected (3). In our case, lung laceration, fractures on the right arm and on left femur were present. In the studies conducted so far it has been reported that heart can very well tolerate the blunt trauma, however as the energy increased pericardial and epicardial bleeding, myocardial contusion, laceration and rupture has been reported to occur (4). After blunt trauma, heart crushing between the sternum and spine, direct damage due to bone fractures, injuries related to reverse force caused by hydraulic impact and acceleration may be observed (5).

In different studies, myocardial contusion is the most frequent cardiac injury with a rate of 7-71% and with the most benign prognosis, its most important findings are arrhythmia, hypotension, cardiogenic shock and cardiac rupture (3,6). Cardiac rupture is rarely seen after blunt chest trauma, but is

associated with high mortality and majority of patients who develop rupture die before reaching the hospital (7). In postmortem studies, cardiac rupture was detected in 36-65% of deaths after blunt trauma (8). Usually the rupture is more common in the right structure of the heart (7). In a study a total of 42 patients with cardiac rupture, 21 had right atrium rupture (50%), 7 had right ventricular rupture (17%), 10 had left atrium rupture (24%) and 4 had left ventricular rupture (9%) (9).

In our case, right ventricular rupture after falling from high was determined. Some patients may be completely asymptomatic during application. In cases who had blunt chest trauma, but their clinical and laboratory findings detected normally should be closely monitored clinically (10).

If the patient is hemodynamically stable, to clarify the diagnosis and to determine other injuries, methods such as chest X-ray, electrocardiography, echocardiography, computed tomography can be used. Hemodynamically unstable patients should receive urgent operation. After determining serious haemothorax in our case after computed tomography, we also performed an emergency exploratory thoracotomy without additional tests.

## CONCLUSION

Thoracic injuries are one of the major causes of death due to trauma. Accordingly, because multiple organ injuries accompany with blunt thoracic injuries, cardiac injuries are more often overlooked than penetrating trauma injuries. In each blunt thoracic trauma every cardiac injury possibility must be kept in mind. In patients where cardiac injury is not fully defined in shock and/or tamponade evidence of cases, we believe that emergency exploratory thoracotomy is life-saving.

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## CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

## STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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