

Case Report

Fatal Blunt Force Trauma to Chest- A Case Report

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Abstract

Assessment of underlying organs while ascertaining cause of death in case of blunt force trauma to particular part of the body is an integral part of forensic autopsies. It is often neglected in absence of external injuries. However the underlying organ might have been injured. Thorough examination helps the forensic pathologist. In case of blunt force trauma to chest, cardiac assessment with special reference becomes mandatory. We present a case of 34 year old male who succumbed after a fatal trauma to the chest without any external injuries.

Keywords: organs, blunt force trauma, forensic pathologist, cardiac assessment

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Introduction:

The blunt force trauma to any part of body sometimes may not have any external injuries. But there is a possibility of underlying organs being damaged. It is more noticeable in case of abdominal organs, but not uncommon in chest. In cases of blunt force trauma to the chest, cardiac injuries have an important consideration. The vulnerability to cardiac injuries can be explained by the anatomical location of the heart between the sternum and the vertebral column¹. Myocardial contusion is the usual cardiac complication in blunt force trauma to the chest². The incidence of cardiac injuries following blunt force trauma to the chest varies from 5% to 50%¹. The injuries could be due to fractured ribs piercing the heart causing the lacerations, blunt force causing the contusion or abrasions. In many cases epicardial and subendocardial hemorrhages may be seen. But the subendocardial hemorrhages are not a consistent finding in cardiac injuries due to blunt force trauma as these hemorrhages

can be seen in non-traumatic cases too³. Hereby we present a case of 34 year old male who succumbed after a fatal trauma to the chest.

Case report:

History:

A deceased aged 34 years was assaulted by accused due to an old rivalry. After which he was taken to a Government hospital where he died while under treatment. The body was brought to mortuary and subjected for postmortem examination to complete the legal formalities.

On Autopsy:

External features:

There were multiple abrasions, contusions, lacerations all over the body with fracture of both humerus and both the bones of left leg.

Internal features:

Thorax:

There were fracture of 2nd to 6th ribs and 4th to 6th ribs along the midclavicular line with associated contusions of intercostal muscles on the right and the left side respectively.

Aorta: Multiple atheromatous streaks were present over the aortic intima.

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Heart: Weighed 240 gm. subendocardial hemorrhages were present over the wall of the left ventricle. Valves were competent. The left and right ventricular wall thicknesses were 1.5 cm and 0.4 cm respectively. The left coronary artery showed near total occlusion of its lumen on cut section. Other coronary arteries were unremarkable.

All other internal organs were unremarkable.

Histopathological Examination:

Heart: Myocardium did not show any changes related to myocardial damage. However the left anterior descending coronary artery was gritty on cut section and showed atherosclerotic changes with luminal narrowing of more than 75%. Left circumflex and right coronary arteries were gritty on cut section.

Aorta: Showed atherosclerotic changes all over.

Cause of death:

The deceased died due to cardiac complications sustained due to blunt force trauma to the chest.

Discussion:

Higher rates of missed injuries are associated with blunt force trauma.⁴ The common visceral injury in case of blunt trauma to the chest is cardiac injury, also called as myocardial contusion. The high energy trauma can cause various cardiac injuries which includes myocardial contusions or valvular contusions and rupture of the heart. The usual reason for cardiac contusion is acute elastic compression between the vertebral column and sternum. It can occur also due to so called "Water hammer effect" – sudden increase in the blood pressure inside the chambers of the heart following blunt force trauma leading to distension, shearing or rupture of heart.¹ Of all the complications, acute myocardial infarction as a sequelae of coronary vasospasm, rupture of atheromatous plaque, dissection of coronary arteries and coronary thrombosis is one of the rare entity following blunt trauma to the

chest. The sudden impact over the heart can lead to disturbance in the cardiac conduction system which may result in arrhythmia. The high mortality rate can be explained by the arrhythmic or hemorrhagic complications.¹ In this case the fatality is related to subendocardial hemorrhage which was present over the left ventricular wall along with the complications associated with atherosclerosis and narrowing of the coronary artery. Though the myocardium did not show any histopathologic features, which can be attributed to the incidence occurring within six hours as the features are not visible in the myocardium in these early hours. Hence the already compromised heart (narrowing of coronaries) and trauma (physical assault) releasing catecholamine which cause myocardial damage in normal hearts and aggravate cardiac damage in ischaemia.⁵

Conclusion:

Blunt force trauma to the chest has various complications which needs immediate tertiary care interventions. Sometimes external appearance may conceal the damage occurred internally following the trauma, so the treating physician should not get misguided by it.

References:

1. Zerbo S, Maresi E, Portelli F, Sortino C, Ventura Spagnolo E, Procaccianti P, Argo A. Death of a 23-year-old man from cardiac conduction system injury through a blunt chest impact after a car accident, Egypt J Forensic Sci. December 2014; 4(4): 137–139.
2. Sharma Amit. Acute Myocardial Infarction related to blunt Thoracic Trauma: Review of literature with two case reports. J Indian Acad Forensic Med; 32(2):165-167.
3. Bakkannavar SM, YP Raghavendra Babu, Ashwinikumar, Nayak VC, Manjunath S, Pradeep Kumar G. Subendocardial haemorrhage in autopsied Hearts. Journal of pharmaceutical and biomedical sciences

- (J Pharm Biomed Sci.) 2013, January; 26(26): 410-415.
4. Hodgson NF, Stewart TC, Girotti MJ. Autopsies and death certification in deaths due to blunt trauma; what are we missing; CJS. 2000; 43(2):130-136.
 5. Prichard BN, Owens CW, Smith CC, Walden RJ. Heart and catecholamines. ActaCardiol. 1991;46(3):309-22.