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Case Report

A Silent Death: An Autopsy-Based Case Report on Spontaneous Left Ventricular Wall Rupture

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Abstract:

Sudden natural death is defined as an unexpected death occurring within 24 hours of the onset of symptoms, often in individuals who appear previously healthy or have stable underlying conditions. Myocardial rupture is an uncommon yet highly fatal consequence of acute myocardial infarction (MI), frequently leading to sudden death. This report discusses a case involving a 65-year-old male who was found unresponsive in a public setting, with autopsy findings revealing a lethal rupture of the left ventricular free wall. This case shows how important a proper forensic autopsy is to find small but serious heart problems that might be missed otherwise.

Key Words: Myocardial Infarction; Autopsy; Rupture; Tamponade; Heart Disease.

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Introduction

Sudden natural death is defined as an unexpected death occurring within 24 hours of the onset of symptoms, often in individuals who appear previously healthy or have stable underlying conditions. Among the various causes of sudden natural death, cardiovascular diseases dominate the spectrum, accounting for nearly 40–50% of cases.[1] Within this group, ischemic heart disease and its complications are the most frequent culprits.

Myocardial infarction (MI), particularly the transmural type 2, predisposes the cardiac muscle to weakening and has the potential to lead to rupture. Myocardial rupture is a rare but highly lethal mechanical complication, usually developing in the first week following an infarct, with peak incidence between the third and fifth day. The occurrence of free wall rupture accounts for approximately 1% to 3% of all cases of myocardial infarction.[2] Several factors contribute to this complication, including age above 60 years, delayed hospitalization, absence of prior ischemic events, and lack of reperfusion therapy.[3]

The importance of autopsy in such cases cannot be overstated.[4] It not only aids in identifying the precise cause of death but also contributes to the broader understanding of fatal cardiac events and public health awareness.

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Case Report:

A 65-year-old male, reportedly without any known comorbidities, was found unresponsive on the roadside and declared dead. The body was referred to the ESIC Medical College & Hospital for Medico-legal autopsy to ascertain the cause of death. The external examination revealed no significant signs of trauma except for a

mild contusion over the right frontal region of the scalp.

The internal examination findings showed 160 grams of clotted blood in the pericardial sac. The heart weighed 378 grams and exhibited a rupture measuring approximately 3.0 × 1.5 × 1.0 cm on the anterior wall of the left ventricle, with the left ventricular wall thickness measuring 1.6 cm (Figure 1). The examination of the coronary arteries revealed significant atherosclerotic changes (Figure 2), with the left anterior descending and right coronary arteries showing 90–95% occlusion, and the left circumflex artery being completely occluded. A sub-scalpal contusion measuring 2.5 × 1.0 cm was noted over the right frontal region of the head. Additionally, subdural hemorrhage was observed over the bilateral frontal regions of the brain.

Histopathological findings

Histology of ruptured myocardium showed infiltration by macrophages and interstitial hemorrhages, confirming myocardial rupture (Figure 3). Sections from coronary arteries and the aorta exhibited advanced atherosclerosis (Figure 4).

Discussion:

Myocardial rupture represents one of the most devastating complications of acute myocardial infarction (MI) and is associated with a high mortality rate.[5] Rupture can involve the left ventricular free wall, interventricular septum, or papillary muscles.[6] It may occur suddenly or in a subacute manner.

The pathogenesis involves full-thickness myocardial necrosis due to inadequate reperfusion.[2] Risk factors include age more than 60 years, hypertension, absence of angina, and large infarct size. In this case, no clinical history was available, emphasizing the 'silent' nature. The dissection of the heart shows the importance of considering cardiac rupture in sudden death cases and the essential role of forensic Medicine.

In this case, the rupture occurred in the anterior wall of the left ventricle, which is a common site for such complications, highlighting the classical pattern seen in transmural infarctions. The presence of advanced atherosclerosis in both the left anterior descending and right coronary arteries suggests chronic ischemic heart disease, potentially undiagnosed due to the absence of medical history. Such silent myocardial infarctions may go unnoticed until a fatal event like rupture occurs.[3] This finding correlates with literature noting that not all ruptures result in tamponade, especially when the rupture leads to immediate circulatory collapse.[7]

Histopathological features like macrophage infiltration, interstitial haemorrhage, and focal myocyte loss point to a subacute infarction phase, typically observed between 3 to 7 days post-myocardial Infarction.[8] The calcification and fibrosis seen in the coronary vessels and papillary muscles suggest longstanding atherosclerosis, adding to the risk profile for rupture.[9] During the 3–7-day window, structural integrity is lowest, making transmural infarcts susceptible to rupture, especially without reperfusion therapy. These findings point to a silent, subacute infarction in a high-risk individual (>60 years, likely undiagnosed chronic ischemia), ultimately resulting in sudden cardiac rupture.

Correlations in Indian data Goyal & Yusuf (2006) estimated that 25% of global cardiovascular deaths occur in the Indian subcontinent, with an average onset age of 53 years (vs. 63 in Western populations).[10] The ICMR–INDIAB study noted that 20–30% of adults in urban India have asymptomatic coronary artery disease, often undetected until catastrophic events.[11]

In global data according to the Global Burden of Disease (GBD) 2019 study: Myocardial Infarction causes over 9 million deaths annually world wide Left

ventricular free wall rupture occurs in 1–3% of all Myocardial Infarctions data from the U.S.2 National Registry of Myocardial Infarction (NRMI) show that cardiac rupture occurred in 0.7–1.4% of Myocardial Infarction cases, most within the first 5 days.[8]

Farb et al. (1999) emphasized that silent infarctions, particularly in elderly hypertensive males, often present only post-mortem due to lack of symptoms and limited diagnostic access.[9]

Conclusion:

This case highlights an uncommon cause of sudden natural death—spontaneous rupture of the left ventricle as a complication of myocardial infarction. The findings align with both regional and global epidemiological patterns of undiagnosed chronic ischemic heart disease, particularly in individuals lacking prior symptoms or diagnosis and it reinforces the critical need for Regular cardiovascular screening in high-risk populations, Early recognition of myocardial infarction symptoms, Increased public awareness, especially in resource-limited settings, Thorough forensic autopsy and histopathological analysis for accurate diagnosis, cause-of-death determination, and public health surveillance. Such integrative efforts are essential not only for individual case resolution but also for guiding preventive health measures and enhancing medico-legal practices.

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