



Case Report

Myocardial infarction and concurrent chest injuries: Two case reports

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ABSTRACT

Two cases of sudden death due to myocardial infarction which were associated external injuries on the chest are discussed here. Injuries were in the form of abraded contusions on the anterior part of chest. Both the cases were declared dead on arrival to the casualty section (Accident and Emergencies Department). In these cases, mention of injuries was not made in the inquest report. In both the cases, suspicion of foul play or the trauma induced myocardial infarction were ruled out by inquiring into the incidents by the autopsy surgeon. The cases highlight the importance of detailed history by the autopsy surgeon in cases of sudden death with associated injuries on the front of the chest.

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1. Introduction-

Myocardial ischemia clinically presents as severe pain in the chest along with a feeling of compression. The patient may curl himself on bed to get some relief. Sometimes patient may ask the attendants to press the chest or he himself may do so. This may result in injuries over the front of the chest. Two such cases of sudden death are presented here, where abraded contusions were produced over the precordium due to forceful rubbing. A blow or injury to chest may precipitate myocardial infarction or arrhythmia leading to death. Interpretation of these types of injuries is very vital in determining the manner of death.

2. Case 1

A 51-year-old male servant, working in a semi government organization, developed sudden onset of severe chest pain. Immediately he was rushed to the hospital, where he was declared 'dead on arrival'.

At autopsy, on external examination, he was a well nourished person of average built. Fingernails were bluish. A reddish abrasion was found over the precordium measuring 14 cm × 8 cm (Fig. A). No other injuries were present over the body.

Dissection of abrasion showed contusion of underlying intercostal muscles. The heart weighed 350 g. The external surface of the heart showed a whitish patch on the left ventricle.

On dissection, the left ventricular wall was hypertrophied with many whitish fibrotic areas suggestive of old healed intramural infarcts (Fig. B). The coronaries showed narrowing at their ostia (Fig. C). The left anterior descending coronary artery showed calcification and narrowing (Fig. D). Numerous atheromatous plaques were also found in the lumen of the ascending aorta. The heart was sent for histopathological examination. Histopathological examination did not show any evidence of fresh myocardial infarction but confirmed severe coronary artery narrowing.

Inquiry of relatives (eye witnesses) by the autopsy surgeon revealed that, after climbing to the second floor of the office the victim started squeezing and rubbing his chest. This he did in order to relieve the severe chest-pain that he was having. He had continued to do so while being shifted to the hospital and had lost his consciousness before reaching the hospital. He was declared dead on arrival at the casualty. So, it was concluded that the injury over the chest was due to vigorous rubbing by the patient himself to mitigate the pain.

3. Case 2

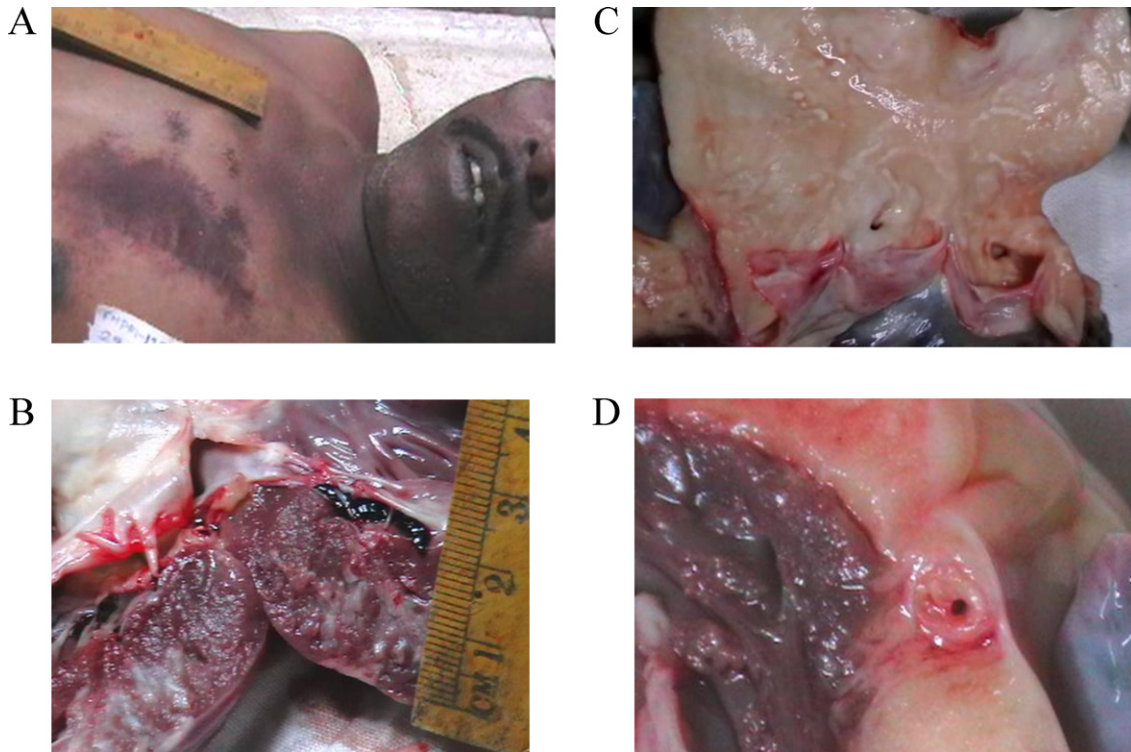
A 34-year-old man was brought to casualty department with history of unconsciousness which followed an episode of severe chest pain. He was declared 'dead on arrival'.

The deceased was moderately built and well nourished. Two reddish abraded-contusions were present on the anterior aspect of the chest wall, measuring 12 cm × 5 cm on the right side and 7 cm × 4 cm on the left side of the chest (Fig. E).

On internal examination, a contusion measuring 2 cm × 1 cm was present on the anterior surface of the middle lobe of the right

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Figs. A–D. Case 1. (A) Abraded-contusion on the precordial area. (B) Hypertrophy of left ventricular wall with fibrotic areas. (C) Atheromatous plaques in the aorta with narrowing of coronary ostia. (D) Significant narrowing of the anterior descending branch of left coronary artery.

lung. Another contusion measuring 4 cm × 3 cm was present on the anterior surface of the lower lobe of the left lung (Fig. F). The heart weighed 250 g. Both right and left coronary arteries were found to have thrombus in their main trunks.

Inquiry by the autopsy surgeon, into the incident revealed that, the deceased developed severe chest pain for which a local non-allopathic doctor was consulted. The doctor had advised vigorous rubbing and pressing of the chest (unscientific cardiac massage) until he could be brought to the tertiary hospital in the city. Relative continued to do the advised “resuscitative manoeuvre”, which involved pressing of chest, for about an hour. This had produced abraded contusions over the chest.

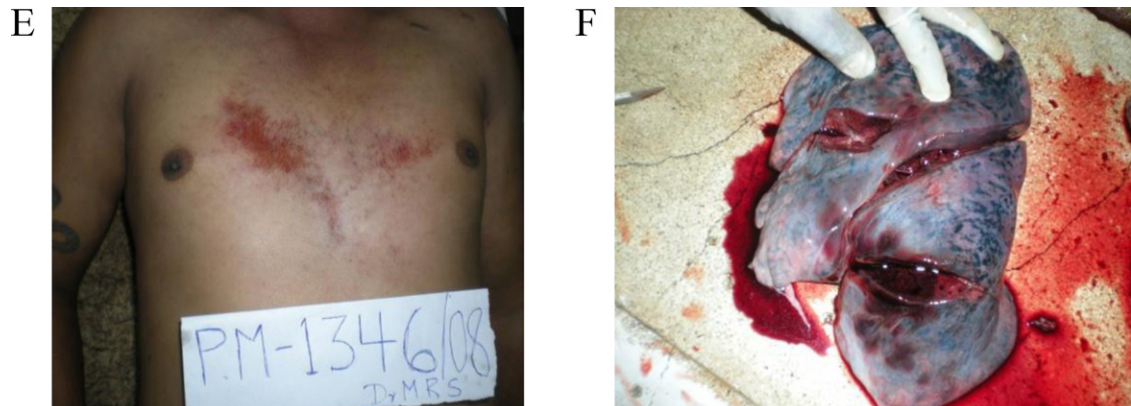
In this case as well, it was concluded that the injury over the chest was due to overzealous resuscitative measure given by righteous intended relatives of the deceased.

4. Discussion

Pain is the most common presenting symptom in patients with myocardial infarction. The pain cannot be quantified, but still it is described in a manner that gives a fair idea about the gravity of situation. Adjectives commonly used to describe the pain are heavy, squeezing and crushing, although occasionally it is described as stabbing or burning [1].

In younger people infarction is usually accompanied by severe crushing chest pain and signs of shock [2].

A blow or some physical trauma over the chest may precipitate myocardial infarction or arrhythmia. The emotional upset that accompanies this type of injury can cause death due to transient hypertension or tachycardia that may precipitate a sub-intimal hemorrhage, arrhythmias, or cerebral or subarachnoid hemorrhage.



Figs. E and F. Case 2. (E) Abraded contusions on the front of the chest. (F) Contusion in the left lung.

Physical effort which can damage a diseased heart in some cases can be traced to unusual job or to the performance of unaccustomed work, to accidents or other trauma.

In peri-mortem injuries (that occur during the act of dying), hemorrhage may be seen involving the soft tissues. Contusion-abrasion of chest wall, fractures of ribs, fractures of the sternum, contusions of the heart, contusions and lacerations of the liver and spleen, rupture of the heart and duodenum usually occur during resuscitation [3].

In case of trauma induced myocardial infarction, until recently the prevailing thought was that coronary artery occlusion occurred only when there was preexisting atheromatous disease [4–6]. Facts contrary to this belief are now emerging to prove that coronary occlusion could occur in the absence of existing coronary artery plaques [7,8]. Animal studies have confirmed that blunt chest trauma can result in coronary occlusion in a plaque-free coronary artery by causing intimal tears with subsequent thrombus formation or spontaneous thrombus formation without an associated tear [9].

The most frequently injured vessels are the left anterior descending coronary artery (76%) and the right coronary artery (12%). This is surprising as one would have expected the more anterior placed right coronary artery to be involved more frequently [10].

The causes of blunt chest injury resulting in myocardial infarction, have varied from major injuries such as blast trauma and motor vehicle accidents, to minor trauma as punch on chest [11], being struck on chest by football [12], soft ball [13].

Mechanism of injury is attributed to sudden acceleration/deceleration causing the heart to be forcefully thrust against sternum, compression of heart between sternum and vertebra and increase in intra thoracic pressure [14].

5. Conclusions

With reference to the case-1 (self induced injury to relieve pain), the presence of such injuries in un-witnessed deaths arouses suspicion of foul play. In such a case determining whether the injury precipitated the infarction or the injury was self induced to mitigate the pain is very difficult.

With reference to the case-2 (injury due to overzealous resuscitation by relative), the presence of such injuries, in cases where there is no history of cardio-pulmonary resuscitation being done in the hospital may arouse suspicion of foul play.

In these two case reports presented here, the injuries on the chest could have been mistakenly linked to the trauma induced myocardial infarction on empirical observation.

This paper thus while highlighting the importance of detailed history by the autopsy surgeon in to the incident, calls for open mindedness in interpretation of such injuries lest the misinterpretation of such injuries may lead the Investigating Officer to proceed in wrong direction. Finally we should never be prejudiced or jump in to conclusion without considering all the facts of a case.

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