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# A Rare Case Report of Myocardial Infarction Due to Lightening

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## Introduction

Lightening is a natural phenomena which can lead injuries to the body. Lightning strikes in contrast to other high-voltage accidents are characterized by an extremely strong current and an extremely short exposure period. Injuries result from either the electrical energy, the high temperature, and/or the explosive power of the blast[1,2]. It can involve all systems of the body,but short term mortality depends on cardiac affects. The electrophysio-logical effects on heart can result in supra ventricular tachycardia, ventricular fibrillation, asystole, QT prolongation, non-specefic ST-T wave changes. we present a case of lightening induced myocardial infarction which is a very rare complication.

## Case

46 year old male was hit by a lightening side splash as he went out of his home with umbrella in his right hand. He felt unconscious and regained consciousness while being transferred to hospital. On arrival to patient has a GCS of 15/15 with BP 126/70 respiratory rate of 17 breaths per minute and temperature of 37 degree celcius. patient complained of chest discomfort and pain on right side of body. Examination revealed 25% burn on right side of body. Examination of other systems was normal. 12 lead ECG showed ST elevation in lead II, lead III and aVF. Cardiac enzymes were elevated. ECHO showed hypokinetic inferior basal of left ventricle. Ejection fraction was normal. Coronary angiography was done and it was normal. On the 2nd day of admission T wave inversion appeared in leads II, III and aVF as shown in figure 1. CT head and USG abdomen were normal. The patients was managed with IV fluids, daily dressings, good protein diet and medications including antibiotics, anti-schemic, anti-platelets, statins and beta-blockers and low molecular

weight heparin . Patient improved well and was discharged on 7th day of admission.

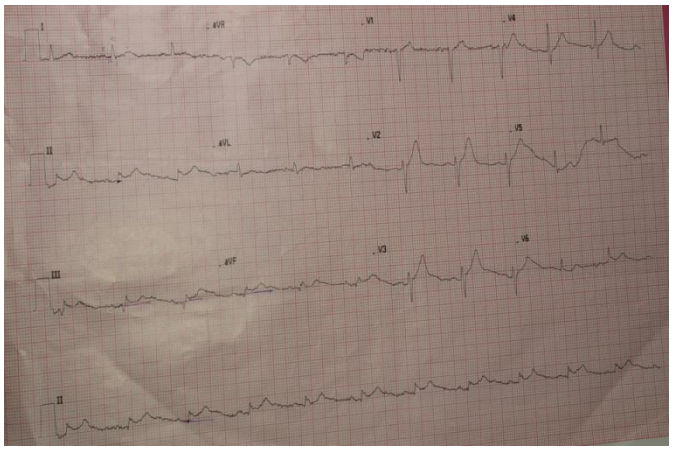

**figure 1**

**Discussion**

Injuries and death occurring due to lightning strike are reported frequently[3]Worldwide mortality of lightning is estimated to be 0.2-1.7 deaths/ million people[4]. The primary cause of death is asystole or ventricular fibrillation, which occurs as a result of depolarized entire myocardium due to massive direct current shock [4,5]. For cases in which cardiac automaticity restore organized cardiac activity and spontaneous circulation return, respiratory arrest due to paralysis of respiratory center play a critical factor in mortality[6]. Cardiac events following lightning strikes and the severity of these events vary according to the electric current strength and the duration of exposure[4] The exact mechanism of the cardiac damage seen in lightning strike is still unknown. In one case, emergency defibrillation was performed on a patient developing ventricular fibrillation after lightning injury[4.] Later, asystole developed, and ST elevation in inferior leads and ST segment depression in anterior leads were observed in the ECG taken after CPR. The coronary arteries were reported as normal in the emergency coronary angiography of that case. Another case has been reported in literature with acute inferior MI in the ECG after defibrillation[7] while a different case has been reported with ST elevation due to direct lightning injuries[8] .Similarly, inferior MI was detected in the ECG in the case under review. The coronary arteries were observed to be normal on coronary angiography. It was thought that since our patient was exposed to a direct lightning current, MI occurred due to coronary artery spasm, and hypoxia occurred after respiratory arrest and thermal injury

Suggested hypothesis include direct thermal injury, the induction of coronary artery spasm, catecholamine discharge or autonomic stimulation through an unknown mechanism, arterial thrombosis and circulatory disturbance in cardiac microvessels[4,5]. Lightning victims may present with sinus tachycardia, transient ST-segment elevation or depression, QT prolongation, premature ventricular contractions, atrial fibrillation, or bundle-branch block[4,6,9]. In our patient initial ECG ST-segment elevation in leads II, III, aVF, (Fig. 1). Previous studies also demonstrated that ST-segment and T-wave changes generally occur on the inferior and anterior aspect of the heart (Table 1). The reason of this is not clear yet. We think that these aspects of the heart are more prone to the affects of current of lightning. Previous reports also suggest that lightning strike do not give harm to coronary arteries, but may injure directly myocardial cells[4,10]

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