Case Report

ELECTROCUTION BY LIGHTNING – AN UNUSUAL PRESENTATION

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Article history
Received Nov 11, 2014.
Recd. in revised form Dec 17, 2014.
Accepted on Dec 25, 2014.
Available online Jan 01, 2015.

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Abstract
Lightning is one of the rare causes of unnatural deaths. This case report describes an unfortunate event in which a 50 year old male was struck by a lightning while riding a bike. A complete autopsy and a thorough examination of the place of incidence were carried out. The present case is an example for contact strike mechanism of lightning injuries. Based on the injury pattern observed on the body it can be concluded that a high voltage current had passed through the victim. No specific kerauno-pathologic features were found on the victim. Since the event was witnessed, the manner of death could be easily established.

Keywords: Lightning, electrocution, Kerauno-pathology, bike

Introduction

Lightning is one of the most commonly occurring natural phenomena. During lightning there is a massive electrostatic discharge between electrically charged regions within the clouds or between the surface of earth and clouds. About 50,000 thunderstorms and 8 million lightning flashes occur worldwide every year[1,2].The lightning can be categorised into intra-cloud, inter-cloud and cloud to ground discharges, with the cloud-ground type possessing the most destructive effects [3].

Lightning has an enormous energy with 10,000 to 200,000 amperes of current and voltage that ranges from 20 million to 1 billion[4,5]. Amazingly, though a large amount of energy is involved, the mortality when a lightning strikes a person is only 30% [6,7]. More than 2000 lightening related deaths occur every year in India [8]. This case report describes a case in which a motorcycle rider was struck with lightning and ultimately lost his life.

Case report:

A 50 year old man was riding a bike near his village on a rainy evening and was struck by lightning. As a result, both the rider and the motorcycle sustained severe damages. This event was witnessed by another biker who immediately rescued the victim and took him to a local hospital. From there he was referred to this institute where he succumbed to his injuries.

At autopsy, superficial to deep burns were present involving 80 % of the body surface area. These injuries mostly comprised of single and multiple confluents circular burns (Fig. 1). A circular raised charred injury with a small central ulceration was present over medial aspect of right knee (Fig. 2). Skin splits along with charring were noted over medial aspect of left thigh, right leg and right foot (Fig. 3). A laceration of dimension 4 cm x 1.5 cm x 0.5 cm was noted on left forehead. Multiple reddish grazed abrasions of different sizes and shapes were observed over the face and left upper limb. The cause of death was due to extensive burn injuries.

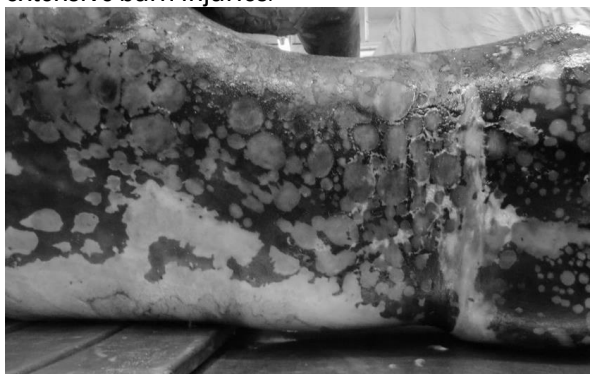

Fig 1: Photograph showing crocodile skin pattern of injuries on the trunk

Fig 2: Burn injury on the anterio medial aspect of right knee suggestive of contact with bike

Fig 3: Charred right foot with skin split Scene of incidence

The place of incidence was thoroughly investigated. A partially burnt old bike with iron basket attached on either side was noticed at the scene of incidence. Front of seat, headlight and right side of handle, right brake handle and right rear view mirror were completely damaged. Right shock absorber, right side of fuel tank, frame, and engine were partially burnt. Other regions of the bike including the tyres were unaffected. (Fig. 4)

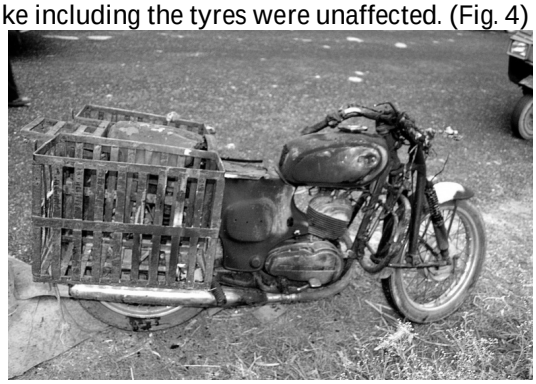

Fig 4: Picture depicting the damages on the bike produced by lightning.

Discussion

Lightning is discharge of static electric charge developed in the clouds. When the lightning discharges, it tends to follow a path of least resistance [9]. The resistance offered by a metal is much lower when compared to atmosphere. Since most of the bike components are made of metal, it offers less resistance for the lightning to pass through. Usually a person riding a bike will be in contact with metallic brake handle and the lower limbs will be in close proximity to the fuel tank and engine. This can be evidenced by the distinctive pattern of injuries on the body of the victim.

In the present case, the victim was electrocuted when the lightning bolt struck the bike. Owing to very high voltage, characteristic skin burns were noted on the victim (Fig. 1). The crocodile skin pattern found on the victim was produced as a result of spark burns due to multiple current arcs [10]. The raised crater with central ulceration present over medial aspect of right knee might be produced due to contact with the fuel tank. If the current leaves the body by arcing, third-degree burns can occur [11,12]. The completely charred right foot with skin split (Fig. 3) might be either due to exit of the electric discharge as it was in contact with metallic brake. No specific kerauno-pathologic features were noted on the victim, since the victim was not directly struck by the lightning. Kerauno-pathology is the effect of lightning on living organism.

Lightning strikes are not always witnessed. In the absence of such reliable history, a meticulous search for evidence should be carried out. A thorough examination of incidence site and dead body are thus essential so that the investigation could be carried out in the right direction.

Prevention

1. It is better to avoid going outside in the presence of thunderstorm.
2. Seek shelter in a large permanent building if caught in thunderstorm. Avoid using wired electrical gadgets.
3. If no building is found in the vicinity, stay inside a hard top automobile like car. Avoid contact with the steel frame of the vehicle.
4. Seek shelter in dense areas of small trees or bushes if struck at a forest. Stay away from tall trees as they attract lightning.
5. If time does not permit evacuation to a safe place, immediately squat down with the head placed between the knees and hand closing the ears. In this position the path taken by the current may not involve the vital organs like brain and heart. Do not lie flat on the ground.

Conflict of Interest

None declared.

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