International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 707-710 www.ijdmsrjournal.com ISSN: 2582-6018

A Rare Case of Electrocution Induced Bilateral Diffuse Pulmonary Alveolar Hemorrhage

Dr Kuldip K Trivedi, Dr Sanket T Marwah, Dr Saraswati Prajapati, Dr Aakash Gandhi, Dr Khushali L Patel, Dr Nilay N Suthar, Dr Jaydev S Mod

1st year resident general medicine department nhl municipal medical college
Address-15107,resident hostel,svp hospital,ahmedabad,gujarat.
1st year resident general medicine department nhl municipal medical college
1st year resident general medicine nhl municipal medical college
1st year resident general medicine department nhl municipal medical college
Associate professor general medicine department nhl municipal medical college
Head of unit general medicine department nhl municipal medical college
Assistant professor general medicine department nhl municipal medical college

Submitted: 20-09-2021 Revised: 28-09-2021 Accepted: 30-09-2021

ABSTRACT

We report a case of diffuse alveolar hemorrhage in bilateral lung fields following electric shock injury on the right foot by machinery . A 20 year old male presented with a/h/o-electric shock by contact of right bare foot with loose wire from heavy machinery in the factory after getting wet in the rain .Thereafter he developed one episode of hemoptysis. Chest x-ray done at local hospital demonstrated multiple scattered areas of soft tissue opacity in right lung field and in left mid and lower zones.Chest computed tomography done in our institute revealed diffuse alveolar hemorrhage in bilateral lung fields . Ecg after admission was suggestive of sinus arrhythmia. Evaluations including serum troponin,n-terminal pro bnp type natriuretic peptide and coagulation studies were normal. The patient was treated for suspected electricity induced lung injury and for rhabdomyolysis with volume resuscitation .He recovered with complete resolution of chest radiograph abnormalities by day 3.

I. INTRODUCTION

Electricity induced lung injury has rarely been reported but can occur after high or low voltage exposure,it is a rare example of pulmonary oedema due to electrical injury in literature.Arrhythmia leading to cardiac arrest was considered to be the cause of death.(2)

In other reported cases, the electric current appears to directly injure lung tissue with focal consolidation on radiographs and necrosis and coagulation on histopathological examination.The electrical injury may lead to additional complications such as haemoptysis,acute respiratory distress syndrome and infection .(3)

We report a case of bilateral diffuse alveolar hemorrhage and hemoptysis after electrical injury.

II. CASE

A 20 yr old male patient suffered an electric shock immediately after joining a work shift in a local factory . The patient was drenched in water due to the rains and his wet bare foot touched loose wire of the machine and he suffered from an electric shock .There was no loss of consciousness reported and no witnessed seizure activity after the event .

He had one episode of coughed bright red sputum mixed with flood immediately following the event and was rushed to nearby hospital . He had no past medical history of respiratory or cardiovascular disease .Vital signs on presentation at the local hospital showed a temperature of 37 c , a pulse rate of 102/min, an arterial blood pressure of 128/72 mmhg ,a respiratory rate of 18 breaths/min and a room air peripheral capillary oxygen saturation of 90%.

Physical examination revealed scattered crepitations in both lungs and 1*1 cm wound over the medial aspect of the right great toe about 4cm proximal to base of toe -brown in colour with no active bleed or ooze, possibly the entry wound- and 1*1 cm wound over the plantar aspect of the left great toe base-possibly exit wound .

Patient was preliminary treated at a local hospital and referred to our institute for further management.

After admission in our institute a detailed laboratory and radiological investigations were done.

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 707-710 www.ijdmsrjournal.com ISSN: 2582-6018

His chest radiograph demonstrated multiple scattered areas of soft tissue opacity in the right lung field and in left mid and lower zones.

His chest computed tomography scan demonstrated diffuse alveolar hemorrhages in bilateral lung fields .

Laboratory results demonstrated the elevated levels of serum creatinine phosphokinase (cpk),714u/l. Urine myoglobin was sent on next day was positive .The serum troponin level and aspartate aminotransferase were within normal range.The platelet count,prothrombin time and partial thromboplastin time were within normal range .Sinus arrhythmia was found on ecg but normal cardiac function was observed on an echocardiogram.

Thus the patient was suspected to have electricity induced lung injury complicated by haemoptysis and rhabdomyolysis .

He was treated with volume resuscitation.Serum cpk and ldh started decreasing on day 2.

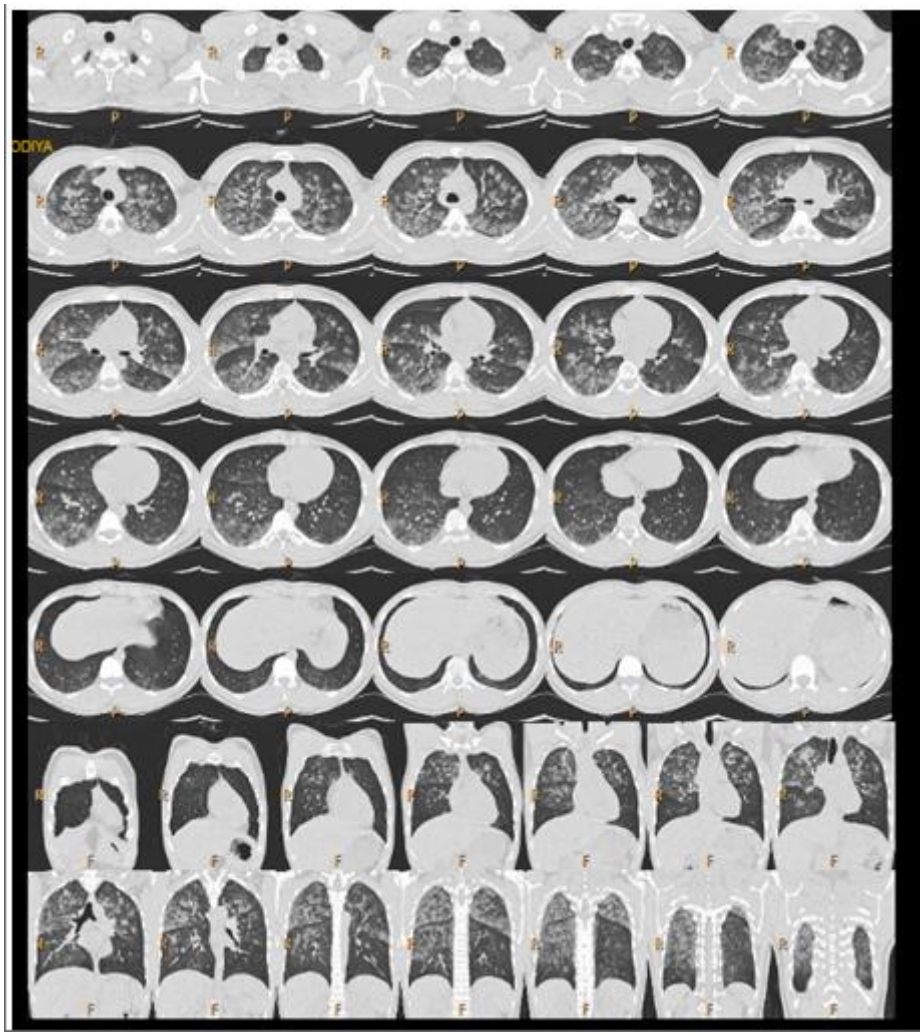
Patient remained conscious ,oriented and vitally stable throughout the hospital course.

Renal function remained normal throughout the hospital course .

Chest radiograph performed on day 3 showed complete resolution of the opacities and the patient was discharged .

X ray on admission

International Journal Dental and Medical Sciences Research
Volume 3, Issue 5, Sep-Oct 2021 pp 707-710 www.ijdmsrjournal.com ISSN: 2582-6018



HRCT ON ADMISSION

III. CONCLUSION

Both thermal and non thermal mechanisms may contribute to electricity induced tissue injury.

Correlation between Cutaneous injury and visceral injury after electric shock is weak,Although our patient was exposed to **electrical injury,His cutaneous manifestations were focal and mild.**

Electric current through visceral tissue can cause joule heating and irreversible denaturation of macromolecules throughout the cells. (6)

In addition,electric forces can lead to electroporations, in which polar amino acid residues re-orient and cause conformational damage of channel proteins.These mechanisms may result in cell membrane dysfunction ,injury ,rupture and necrosis .(6)

The severity of damage is associated with the characteristics of electric current including magnitude,type and direction,and by the interval of contact,resistance of the interval of point,and personal susceptibility.(6)

Our case is a report of a rare case of acute bilateral pulmonary infiltrates due to electrocution without cardiac arrest.The radiographic features and haemoptysis we observed were consistent with pulmonary alveolar hemorrhage and diffuse lung injury.

Detailed clinical and radiological workup done did not identify myocardial necrosis,left ventricular dysfunction.

Therefore direct lung injury by electrical current leading to diffuse alveolar hemorrhage remains a possible mechanism in this case.

Disclosure statement

Written informed consent was obtained for publication of this case report and accompanying images from the patient,explaining to him in his own vernaculum.

No conflict of interest.

REFERENCES

[1]. J Burn Care Res. 2021, PMID 33970245, Electricity induced burns and lung injury, Kanchan T et al.
[2]. Schein RMH, Kett DH, Marchena EJD, et al. 1990. Pulmonary edema associated with electrical injury. Chest 97(5):1248–1250
[3]. Masanes MJ, Gourbiere E, Prudent J, et al. 2000. A high voltage electrical burn of lung parenchyma. Burns 26(7):659–663.
[4]. Schleich AR, Schweiger H, Becsey A, et al. 2010. Survival after severe intrathoracic electrical injury. Burns 36(5):e61–e64.
[5]. Karamanli H, and Akgedik R. 2017. Lung damage due to low- voltage electrical injury. Acta Clin. Belg. 72(5):349–351.
[6]. Marques EGSC, Júnior GAP, Neto BFM, et al. 2014. Visceral injury in electrical shock trauma: proposed guideline for the management of abdominal electrocution and literature review. Int. J. Burns Trauma 4(1):1–6.
[7]. Respirol Case Rep,2018 Feb; 6(2). Low voltage electricity induced lung injury : Thai Truong et al