

Electric Current Causing Sigmoid Perforation: Case Report.

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ABSTRACT

Post electric burn sigmoid perforation is a rare but dreadful complication. It can lead to increased chances of mortality/morbidity if any delay is made during diagnosis or active management. We report a case of electric current burn on left hand, forearm, arm and shoulder with perforation of sigmoid colon with successful management by primary closure.

Key words: Electric current, Perforation Peritonitis, Sigmoid perforation.

INTRODUCTION

Sigmoid perforation due to electric current injury is a rare entity. Previously few cases of enterocutaneous fistula following electric current were reported.^[1] Extensive medline search revealed very limited cases of electric current induced enteric perforations.^[2,3] Such enteric perforations has a potential to progress as haemorrhagic necrosis of the intestines/gallbladder, liver failure, gastrointestinal haemorrhage from stomach and duodenal ulcers, curling ulcers, acute appendicitis, pancreatitis, small bowel perforation, splenic injuries, and mesenteric abdominal trauma.

CASE REPORT

A 31 year-old male, electrician (by occupation) presented in emergency department within 6 hours of history of high tension electric current burn on left hand, forearm, arm, shoulder with severe abdominal pain. He sustained electric current burn accidentally after touching electric cable. He didn't carry any significant past history. On examination he appeared dehydrated having tachycardia (100/min). There was entry wound on left hand and exit wound on left lower abdomen. He had second degree deep burn on left upper limb. There was no other burn injury. Abdomen was distended, tender and resonant on percussion. On investigation Haemoglobin: 13.0gm%, TLC: 14,500cells/cu.mm, SGOT/SGPT: raised, urine (routine/microscopy): few RBC were present. On ECG there was sinus tachycardia and radiological investigation of abdomen revealed gas under both domes of diaphragm. He was diagnosed as acute generalized peritonitis because of hollow viscera perforation. Immediate exploratory laparotomy was performed.

There was about 500cc of blood mixed serosanguinous fluid in peritoneal cavity. Stomach, small and large intestine was erythematous, congested and oedematous. Solid viscera were congested and erythematous. There was perforation of size 1.5x 1.5 cm in middle part of sigmoid colon. The margins of perforation were blackish and necrosed [Figure1]. There was minimal contamination in left paracolic gutter and pelvis. Freshening of margins of sigmoid colon was done and primary closure was done. Left paracolic drain was kept.

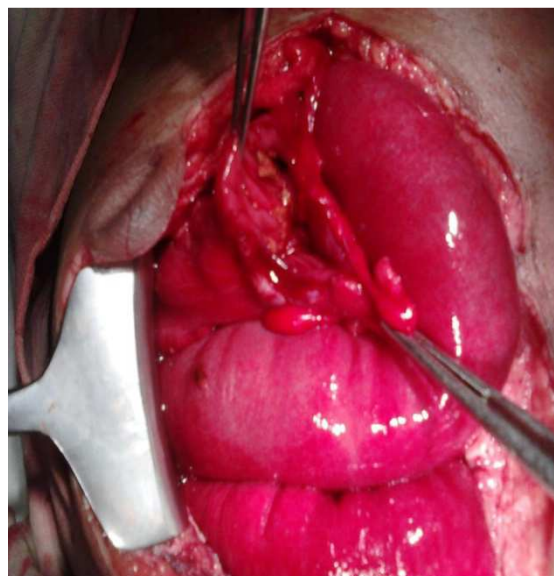


Figure 1: Sigmoid perforation with oedematous and inflamed colon.

Postoperatively patient recovered and developed wound infection. He was discharged on 10th postoperative day. Patient upper limb wound developed wound infection and treated with debridement, dressing, and antibiotics.

DISCUSSION

Electrical burn patients account for approximately 5% of the hospital admissions in major burn

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centers.^[4,5] High-voltage currents (>1,000 V, 50 Hz) can occur either directly via direct contact or indirectly through a conductive materials or equipment.^[6] Both direct and indirect current causes injury and its severity is determined by the voltage, current intensity, types of current, the current pathway, the duration of exposure, the resistance of the tissues, contact surface, the extent of multisystem involvement, and the circumstances surrounding the incident. During electrical burn, electric current is passed through underlying structures thereby causing coagulative necrosis and cell membrane rupture. As current passes through tissues, electricity generates heat according to Joule's law: heat (Joule, J) = I^2 (current) \times R (resistance). The increase in temperature causes the denaturation of macromolecules which is usually irreversible.^[7] However, the resistance of the tissues during the passage of an electrical current is variable (lower for nerves and vessels and higher for fat and bones) and the trauma done by an electrical current varies according to the individual susceptibility and the quality of care provided at the site of the accident.^[8]

Visceral injuries are usually disproportional (rare but severe) to the body surface burned and injuries at the entrance and exit site of the electrical current are found in the surviving individuals.^[9,10] Visceral lesions require active intervention and are associated with high morbidity and mortality. Therefore, visceral injuries should always be remembered in the case of electrical burns and should be managed adequately by a multidisciplinary team. The colon and small intestine were the organs most frequently affected. Less frequently involved organs were the heart, esophagus, stomach, pancreas, liver, gallbladder, lung, and kidney.^[6,11]

Depending upon the extent of the perforation and its anatomical site, as well as on the basis of the presence of diffuse or localized peritonitis, the treatment of perforation will vary from simple suturing, with or without a protective colostomy, to exteriorization in the form of a colostomy, and the Hartmann operation.^[12]

In our case entry wound was in left hand and arm and exit wound on left side of abdomen as patient was wearing shoes at time of injury and patient touched the wall through abdomen. The patient presented early and had minimal contamination so primary closure of sigmoid colon without diverting colostomy was done.

CONCLUSION

Visceral injuries are rare in electrical burns victims, but they should be suspected in an electric current injury, especially in cases of high voltage currents. To avoid diversion colostomy prompt diagnosis with immediate active management to be done in patients suspected perforation peritonitis provided the patient presents within 12 hours.

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How to cite this article: Sharma M, Kaundal P, Sharma P, Chaudhary R. Electric Current Causing Sigmoid Perforation: Case Report. Ann. of Int. Med. & Den. Res. 2015;1(1):39-40.

Source of Support: Nil, **Conflict of Interest:** None declared