Polytrauma with Grade-IV Liver Laceration and Grade-II Renal Laceration: A Case Report

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Abstract

Background: One of the leading causes of mortality and morbidity is road accidents. The commonest cause of polytrauma is due to road traffic accidents, other causes may include self-harming activities, suicide, and murder. Nearly two-thirds deaths due to Road Traffic accidents are reported in India mostly in the age group of 15-44 years. Rescue of patients with polytrauma requires maintaining hemostasis while concurrently administering treatments and using proper triage management according to the severity of the injuries, especially in situations of severe trauma with pulmonary contusion and significant blood loss. Massive hemothorax and extensive tracheobronchial hemorrhage result from serious lung injury. Depending on the amount of chest leakage in cases with hemothorax, emergency surgery is advised. Here we report a case of a 20-year-old adult male who was brought by his parents to the emergency department in a conscious state. The patient reported stained injuries over the face, chest, and left knee. All the necessary laboratory investigations were done after which the patient was shifted to the Surgery Intensive Care Unit. The primary therapeutic intervention was given to the patient and was treated with blood transfusion, antibiotics, antiemetics, and antacids, and a diet was planned during hospitalization.

Keywords: Mortality, Morbidity, Liver laceration, Renal laceration.

INTRODUCTION

Polytrauma is the injuries to multiple areas of the body which mainly result due to road accidents(1). Road Traffic Accidents are one of the major medico-legal cases reported in the emergency ward. Polytrauma most commonly occurs as a result of blunt force or trauma over more than two areas of the body which is usually caused by Road Traffic Accidents, Penetrating injuries, falls from height, assault, airplane crashes, chemical injury, and Self Harm Activities(2). Spontaneous pneumothorax is a well-documented condition characterized by shortness of breath and abrupt chest pain, this condition may lead to hemopneumothorax or tension pneumothorax.(3)

The liver is the most common organ which is injured during any blunt abdominal traumas(4). Usually, liver injuries are not considered major and classified or graded. Grade IV hepatic injury according to AAST (American Association for the Surgery of Trauma) involves tearing of the disarranged parenchymal involving more than 75%of the liver lobe and also involves hepatic vein injuries with vigorous bleeding rupturing the liver parenchyma into the peritoneum(5). Various therapeutic radiological procedures are used for treating liver injuries.

Kidney trauma in simple words is a kidney injury that involves rupturing of the kidney tissues resulting in bleeding or discharge of urine in the abdominopelvic cavity(6). Renal traumas report almost 5% of all total traumatic injuries that are considered critical and need urgent medical attention and treatment. Injured kidneys may also lead to hematuria which is the presence of blood in the urine(7). Kidney rupturing can result either due to direct physical force to the kidney or penetrating traumas. Kidney traumas are also divided according to 5 grades in which each grade shows the severity of the trauma. The grade five kidney laceration needs emergency surgery(8).
In developing countries, the death caused by Road traffic accidents is predicted to be increased by 83%. Road traffic accidents and injuries can be prevented by various preventive measures(9). There are various road safety interventions taken to solve these issues. This involves maintaining the conditions of vehicles, conditions of the road, human factors, legislation, etc(10). Polytrauma leads to injuries to one or more organs, and internal bleeding, which differs in severity and may even lead to the cause of one’s death. Polytrauma either leads to tissue damage or activation of immune defense resulting in the death of cells, necrosis, and apoptosis(11).

CASE PRESENTATION

A 20-year-old adult male was brought by his parents to the emergency department with a complaint of falling from a two-wheeler after striking with a truck resulting in sustained injuries over the face, chest, and left knee. Primary preventive measures were taken by the physician.

A systematic physical examination was performed, and inspection revealed abrasion over the left knee and a limited range of motion. His pulse rate was 116 beats per min which is tachycardia(60-100 beats per minute), blood pressure was measured it showed 110/70 mm of hg, and 89% of the blood's oxygen was absorbed, or SpO2. His right chest's breath sound was less audible. Immediate chest x-ray was recommended, and other laboratory investigations were done.

The report of the post anterior chest X-ray revealed a fracture in the 3rd, 4th, and 5th ribs of the right side of the chest. Lster the blood was drawn and sent for the investigation. Hemoglobin was decreased to 6.5 gm% (ref: 13.2 to 16.6gm%), Total WBC Count increased to 22000cu.mm (ref: 4500 to 11000 per microliter), Granulocytes increased to 84% (ref: 50% to 70%), lymphocytes decreased to 10% (ref: 20%-40%), Total platelet count increased to 4.5Lacs/cu.mm (ref: 1.50 to 4Lacs/cu.mm), in Kidney Function Test the levels of Urea was higher than the normal range i.e. 32mg/dl (6 to 24mg/dl), in Liver Function Test the levels of ALT(SGPT) was 646U/L that is higher than the normal range (0-35 units per liter), AST(SGOT) levels were also high in comparison to the normal range i.e. 750U/L (5 to 40 unit per liter), and simultaneously peripheral smear was done it revealed white blood cells - Neutrophilic leucocytosis with the mild shift to left up to the stage of band forms.

Concurrently Ultra Sonography of the thorax was indicated that revealed right-sided pleural effusion with minimal left side pleural effusion which probably required intercostal chest drainage tube insertion. Computed tomography of the brain was performed that revealed there is e/o well defined thin walled CSF density area in the retrocerebellar region measuring approximately 1.3x4x3.1 cm and communicating with the fourth ventricle s/o isolated inferior vermian hypoplasia. The Contrast-enhanced computed tomography of the abdomen was done to get a detailed view of the blood vessels, the report indicated the American Association for the Surgery of Trauma Grade IV liver injury with grade II right renal injury, hemoperitoneum after which diagnostic laparoscopy was performed. Narrowed intrahepatic part of IVC with surrounding fluid and hyper-enhancing bilateral adrenal glands and kidney suggesting the possibility of profound hypoperfusion. The High-Resolution Computed Tomography scan of the thorax was done that showed Pulmonary contusions in the right lung and superior segment of the left lower lobe, multiple right rib fractures with right-sided hemopneumothorax.

The patient was later shifted to Surgery Intensive Care Unit for further management after a diagnostic surgical procedure of laparoscopy. Therapeutic interventions were provided which included Blood Transfusion which was done to maintain the hemostasis, ICD insertion for pleural fluid collection, Inj. Piptaz 4.5gm, Inj. Pan 40mg bd, Inj. Emset 4mg, Inj Metro 100ml, Inj. Ethamsylate 500mg bd, Nebulization with Duoline, Salt Capsule, Inj. Levofox 100mlbd, Inj. Clindamycin 300mg bd, Inj Albumin 20% stat.

DISCUSSION

Renal injuries are a common result of road traffic accidents, falls, etc. Renal trauma management has evolved over years and now there are various classifications of the care provided for renal injuries depending on the severity of the injury(12). Internal blood loss can result from minor injuries to the spleen, liver, or kidney and cause delayed issues, as well as from the rupture of a large blood vessel. (13). Since outcomes might be negatively impacted by a low index of suspicion, it is crucial to be aware of how severe the damage is. As a result, the physical examination performed at the beginning of the process is not necessarily a trustworthy indicator of the injury's potential. High death rates are seen in patients with severe multiple injuries and extensive
pulmonary contusions with intrapulmonary bleeding(14-20). Not only are there several treatment modalities necessary to avoid cardiac arrest and hemostasis associated with multiple injuries, but they are also necessary to restore oxygenation to save the patient’s life. The study conducted reported around 151 thousand deaths concerning road accidents in 2018. Speeding over the limit is one of the most important factors leading to road accidents in India(21-30). Polytrauma most commonly occurs as a result of blunt force or trauma over more than two areas of the body which is usually caused by Road Traffic Accidents, Penetrating injuries, falls from height, assault, airplane crashes, chemical injury, and Self Harm Activities. Every year up to 3 to 5 percent of the GDP investment is done for road accidents. Road traffic accidents and injuries can be prevented by various preventive measures(16). There are various road safety interventions taken to solve these issues. This involves maintaining the conditions of vehicles, conditions of the road, human factors, legislation, etc(31-35).

CONCLUSION

In this case, the patient was brought to the hospital at an early stage. The investigations were done without any interruptions resulting in providing an early diagnosis. For additional management, the patient was transferred to critical care. The patient was prohibited from engaging in any activities, and the physiotherapist was approached for additional management. Records resulting in providing an early diagnosis. F

REFERENCES


