



Anesthetic Management of Blunt Abdominal Trauma (BAT): Liver Laceration

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Abstract

We are presenting a case report on the anesthetic management of a case of liver laceration with massive bleeding. Anesthetic management involved the principles of early resuscitation, administering anesthesia for hypotensive shock intra-operatively and active post operative care.

Keywords: *Early resuscitation, Shock, Massive Blood Transfusion, Acute Respiratory Distress Syndrome (ARDS).*

INTRODUCTION

The liver is always at a risk of injury in blunt abdominal trauma (BAT), being the largest parenchymatous organ. Exsanguinating hemorrhage is the major cause of death following liver laceration as it receives 25 % of the cardiac output⁴. Again patient recovery depends a lot on how sooner proper resuscitation has been given to prevent death from reperfusion injury and multiple organ systemic failure (MOSF).

CASE REPORT

A 25-year-old male patient was admitted in the emergency room (ER) with history of steering wheel injury in a road traffic accident the previous day. On admission, his general condition was very poor (Pulse: 120/min, low volume, BP: 80/50mmHg), with severe pallor. The GCS recorded was 15/15. USG abdomen revealed liver laceration with haemoperitoneum. He was planned for an urgent laparotomy. Pre operative assessment was done. Early resuscitation was started with crystalloids, maintaining the systolic blood pressure at approximately 80-100 mmHg. His preoperative haemoglobin was 7.2 gm%. He was accepted for general anaesthesia under high risk category (ASA IIIIE).

Patient was preoxygenated, Rapid Sequence Induction (RSI) done with IV Ketamine 75mg, Thiopentone 50mg and intubated following IV Succinylcholine 100mg. Anesthesia was maintained on O₂ and N₂O (1:1), Intermittent positive pressure ventilation (IPPV) and atracurium. About 2 litres of blood was found collected in the peritoneal cavity and there was a further loss of about 1.5 litres during the surgery. Patient was haemodynamically maintained with crystalloids, colloids, and three units of warmed whole blood during the surgery. Following the surgery, patient was shifted to intensive care unit (ICU) for elective ventilation under sedation. In the ICU there was persistent tachycardia and increasing pal-

lor. Suspecting reactionary hemorrhage he was re-explored the following day under ASA IVE category. About 3 litres of fresh blood was found collected in the peritoneal cavity. Two units of warmed whole blood were transfused intraoperatively. Haemostasis was secured. Post operative period was subsequently uneventful. The patient received a total of 9 units of whole blood in the OT and in the ICU within 24 hours. He was discharged on the 14th post operative day in a good health.

DISCUSSION

The anesthesiologist in a trauma centre is involved in the airway and resuscitation management of trauma patients in the ER, OT and ICU¹. For any BAT, initial management is based on advanced trauma life support (ATLS) guidelines. Airway should be cleared, and ventilation secured with ETT if it's leading to hypoxia. The anesthesiologist is responsible for appropriate circulatory resuscitation preoperatively keeping in mind the goals of early and late resuscitation. Fluids include isotonic crystalloids and colloids initially. However, because they do not transport O₂, or facilitate clotting, they should be soon replaced with cross matched blood, in the setting of hemorrhagic shock. Studies have shown improved survival rates when perfusion was maintained just above the threshold of ischemia. The adequacy of resuscitation in the late phase is adjudged by normal tissue perfusion³. Intraoperatively patients with BAT are induced by RSI (rapid sequence induction) considering them to be of full stomach. For induction inj Ketamine and Succinyl choline remain popular for tracheal intubation in trauma patients⁵. The patients with BAT require massive blood transfusion (MBT) which makes them susceptible to its inherent complications. MBT which implies giving one whole blood volume in a 24 hours period, or replacing 50% of the pts blood volume in a 12 - 24 hour period has several complications⁶. Banked blood has 2,3



DPG curve shifted to left for approximately 24 hours post transfusion. Hence post operative elective ventilation is desirable in such patients. Another complication of MBT is coagulopathy. Patients who are not hypoperfused for a long period can tolerate multiple units of blood without developing coagulopathy. Whereas a long hypo-perfused period may produce DIC. When bleeding occurs after transfusion, the differential diagnosis includes dilutional thrombocytopenia, DIC and hemolytic transfusion reactions. A platelet count, plasma fibrinogen level and evidence of haemolysis in plasma can rule out these disorders². Besides this, citrate intoxication leading to hypocalcaemia may produce cardiac complications. Hypothermia may also occur, causing ventricular irritability and cardiac arrest. Hence the importance of giving warmed fluids and blood to all patients. Banked blood also contains an increased amount of micro aggregates which may accumulate in lungs in cases of massive transfusion and cause transfusion related acute lung injury (TRALI)⁵. Post operatively even after adequate resuscitation, morbidity and mortality are increased due to risk of developing Acute Respiratory Distress Syndrome. Delay in resuscitating a hypo perfused patient causes an accumulation of immune complexes and toxic products in pulmonary capillaries leading to increased capillary permeability, destruction of lung parenchyma and ultimately ARDS¹.

Our patient had been managed under ATLS guidelines and undergone MBT, recovery was uneventful. To conclude in patients of severe trauma requiring MBT, following the ATLS guidelines, judicious anaesthetic and surgical management and good intensive post operative care does remarkably increase chances of recovery.

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