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Anaesthetic Considerations & Management Strategies in Polytrauma – A Case Report

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1. Introduction

In the harrowing aftermath of a polytraumatic event, where multiple injuries converge to challenge both the body and the mind, the role of anaesthesia emerges as a critical cornerstone in the journey towards recovery. From motor vehicle accidents to industrial mishaps, polytrauma represents a complex medical scenario that demands a nuanced approach to anaesthetic care.
In this article, we present a case report where we embark on a comprehensive exploration of the anaesthetic considerations and management strategies essential for navigating the intricacies of polytrauma cases. We delve into the unique challenges posed by this multifaceted condition, where the priorities of stabilizing vital functions, minimizing complications, and optimizing outcomes converge with the delicate balance of anaesthetic intervention.

2. Case Report

A 36-year-old female was brought to ER in a conscious state with an alleged history of RTA. Diagnosed to have L1 to L4 transverse process fracture, left elbow dislocation, CECT Abdomen revealed grade IV splenic injury & and grade IV renal injury. Emergency laparotomy with splenectomy & and nephrectomy was planned. Immediately shifted to the OR after activating the massive blood transfusion protocol.
Immediate preop vitals: HR- 112/min, BP-100/70mmHg, SPO2 – 95% in room air
After shifting into the OR, two wide-bore 16G IV needles were cannulated. Left radial artery cannulation was done before induction. Preoxygenated with 100% oxygen for 3 minutes. Induced with Inj. ketamine 40mg & Inj.Propofol 40mg, Modified RSI done. Airway secured. Inj.Noradrenaline single strength was started at 3ml/hr before skin incision with 1-unit PRBC onflow. Inj.Hydrocortisone 200mg IV was given. Surgery proceeded; splenectomy and left nephrectomy were done.
Total blood loss was approximately 2.5 to 2.7L. Managed with 3 units of PRBC, 2 units of FFP, and 2 units of platelets. Inotropes tapered and stopped. Serial ABGs were taken and treated accordingly. Hemodynamic stability was achieved. Postoperatively shifted to ICU for elective mechanical ventilation and in view of massive blood loss, acid-base disturbances due to massive transfusion, and acute kidney injury

3. Discussion

Polytrauma patients present a multitude of challenges to anesthesia providers, necessitating a comprehensive understanding of injury patterns, physiological derangements, and treatment priorities. Key considerations include airway management, hemodynamic optimization, pain control, and prevention of secondary organ injury.
The protocols for the management of polytrauma continue to evolve based on ongoing research and advancements in trauma care. Some general principles are as follows:

1. Early Assessment and Resuscitation: The initial phase of polytrauma management focuses on rapid assessment and stabilization of the patient's airway, breathing, and circulation (ABCs). This includes securing the airway, providing adequate oxygenation and ventilation, controlling hemorrhage, and administering intravenous fluids or blood products as needed to restore perfusion.

2**. Damage Control Resuscitation**: This approach emphasizes the early and aggressive management of coagulopathy, acidosis, and hypothermia (the "lethal triad") commonly seen in severely injured patients. Damage control resuscitation involves permissive hypotension, minimizing crystalloid fluids, early administration of blood

products (balanced transfusion ratios), and correction of coagulopathy with blood components and hemostatic agents.

4. Focused Assessment with Sonography in Trauma (FAST): Ultrasonography is commonly used as a rapid diagnostic tool to assess for intra-abdominal hemorrhage and pericardial effusion in polytrauma patients. FAST exams are performed bedside during the primary survey to guide early interventions and determine the need for emergent surgery.

5. Whole-body CT Scanning: Whole-body computed tomography (WBCT) has become the standard imaging modality in the early evaluation of polytrauma patients. WBCT allows for rapid and comprehensive assessment of injuries to multiple body regions, facilitating timely diagnosis and treatment planning.

6. Multidisciplinary Approach: Polytrauma care involves collaboration among various medical specialties, including trauma surgeons, emergency physicians, anesthesiologists, critical care specialists, radiologists, and rehabilitation therapists. A multidisciplinary team approach ensures comprehensive evaluation, coordinated treatment, and continuity of care throughout the patient's hospitalization and rehabilitation.

6. Early Surgical Intervention: In cases of severe polytrauma with life-threatening injuries (e.g., traumatic brain injury, major vascular injuries, pelvic fractures), early surgical intervention may be necessary to control hemorrhage, decompress compartments, and stabilize fractures. Damage control surgery aims to address immediate threats to life and limb, with definitive procedures deferred until the patient is hemodynamically stable.

4. Conclusion

Trauma patients are often ‘the sickest of the sick’. For successful outcomes following anaesthesia and surgery, resuscitation must be ongoing during induction and maintenance of anaesthesia. In addition, one should pay close attention to the patient’s entire physiologic and volume status during the peri-anesthetic period for a successful management and favourable outcome.