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Navigating the Triple Threat: Anaesthetic Triumph in Polytrauma with Shock and Anticipated Difficult Airway

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Abstract: ***Polytrauma [(2)] represents one of the most demanding emergencies in anaesthetic practice, where rapid decision-making and coordinated multidisciplinary management are crucial for survival. We report the case of a 44-year-old woman with type 2 diabetes mellitus who sustained severe injuries following a pedestrian-bus collision. She presented in hypovolemic shock with a crush injury to the right lower limb and an anticipated difficult airway (Modified Mallampati Grade IV). The patient was classified as ASA IV (E). Initial resuscitation included aggressive fluid therapy, haemostatic support, broad-spectrum antibiotics, analgesia, and optimisation of glycaemic status prior to emergency surgical intervention. General anaesthesia was induced with ketamine to preserve haemodynamic stability. Invasive monitoring and central venous access were established, and a massive transfusion protocol was promptly activated, ensuring balanced blood product administration alongside targeted haemostatic resuscitation and active warming to mitigate the lethal triad of trauma-coagulopathy, acidosis, and hypothermia. Damage control orthopaedics, including external fixation and wound debridement, was performed to minimise operative duration and physiological insult. Postoperatively, the patient received structured intensive care management with mechanical ventilation, haemodynamic monitoring, and ongoing resuscitation. She was successfully extubated on postoperative day one and transferred to the ward on day four. This case highlights the importance of early airway preparedness, adherence to established trauma resuscitation principles, balanced transfusion strategies, and effective multidisciplinary coordination in achieving favourable outcomes in haemodynamically unstable polytrauma patients.***

Keywords: Polytrauma; difficult airway; massive transfusion protocol; damage control surgery; hypovolemic shock; trauma resuscitation

1. Introduction

Polytrauma presents one of the most demanding scenarios in anaesthetic practice, requiring rapid assessment, meticulous planning, and coordinated multidisciplinary action. Patients often present with airway challenges, massive blood loss, and physiological instability, necessitating simultaneous resuscitation and preparation for urgent surgery.

2. Case Details

A 44-year-old female with type 2 diabetes mellitus sustained severe injuries following a pedestrian–bus collision. She presented with a crush injury to the right lower limb, multiple abrasions, and hypotension (BP 80/60 mmHg) suggestive of hypovolemic shock. Airway assessment revealed a Modified Mallampati Grade IV, indicating an anticipated difficult airway.

Preoperative stabilization in the casualty included aggressive fluid resuscitation, broad-spectrum antibiotics, analgesia, haemostatic measures, and glycaemic control. The patient was categorized as ASA IV (E) and posted for emergency surgery.

Intraoperative Management: General anaesthesia was induced with ketamine to maintain haemodynamic stability. Central venous access and invasive arterial monitoring were secured. A massive transfusion protocol [(4)] was activated, with 4 units packed red blood cells and 2 units fresh frozen plasma + 2units of platelets administered intraoperatively. Damage control orthopaedics was performed with external fixation and wound debridement, limiting operative duration. Active warming devices and targeted haemostatic resuscitation were employed to prevent coagulopathy, hypothermia, and acidosis.

Postoperative Care: The patient was managed in the surgical ICU with controlled ventilation, sedation, and neuromuscular blockade. She was extubated on postoperative day one after haemodynamic stabilization and adequate respiratory effort. ICU care included analgesia, infection prophylaxis, nutritional support, venous thromboprophylaxis, and serial monitoring of haematological and biochemical parameters. Additional blood transfusion was required on day three. She was shifted to the orthopaedic ward on day four.

3. Discussion

Key management principles included adherence to ATLS®[(1)] guidelines, damage control resuscitation with permissive hypotension, early balanced transfusion (1:1:1 ratio of PRBC: FFP: platelets), limitation of crystalloids, timely tranexamic acid administration, and vigilant airway planning. Early activation of MTP and strict prevention of the lethal triad were crucial to the positive outcome.

4. Conclusion

This case highlights the importance of rapid decision-making, anticipation of complications, and coordinated multidisciplinary care in managing high-risk polytrauma with anticipated difficult airway.

5. Summary

Polytrauma represents a major challenge in anaesthetic practice, demanding rapid assessment, airway preparedness, and haemodynamic stabilization. A 44-year-old female with type 2 diabetes mellitus sustained severe injuries following a pedestrian–bus collision and presented in hypovolemic shock (BP 80/60 mmHg) with a crush injury to the right lower limb and an anticipated difficult airway (Modified Mallampati Grade IV). She was classified as ASA IV (E) and underwent emergency stabilization with aggressive fluid resuscitation, haemostatic support, antibiotics, analgesia, and glycaemic optimization.

General anaesthesia was induced with ketamine to preserve haemodynamic stability. Invasive monitoring and central venous access were secured, and a massive transfusion protocol was activated with balanced administration of PRBCs, FFP, and platelets. Damage control orthopaedics with external fixation and wound debridement minimized operative duration. Postoperatively, structured ICU care enabled successful extubation on day one and transfer to the ward on day four.

This case highlights the importance of early airway planning, balanced transfusion, and multidisciplinary trauma management.

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