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ADVANCES IN ANESTHESIA

Advances in Trauma Anesthesia

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• Prehospital intubation • Apneic oxygenation • Coagulopathy of trauma
• Hyperfibrinolysis • Damage control resuscitation

Key points

- Managing the airway in the traumatically injured differs from managing the airway in elective patients because patients with trauma present with significant risk for aspiration, possible cervical spine instability, hemodynamic instability, and/or respiratory compromise.
- Apneic oxygenation is a technique that may increase the time to hypoxia when performing laryngoscopy.
- A rapid thromboelastogram gives quicker, more accurate results on the coagulation status of a patient who is traumatically injured compared with traditionally used coagulation studies.
- An LY30 (the percentage of the decrease in amplitude 30 minutes following the maximum amplitude of a thromboelastogram tracing) greater than 3% has been shown to increase mortality in the traumatically injured and is a possible trigger for administering antifibrinolytics.
- Damage control resuscitation should be used in conjunction with damage control surgery in selected patients for the treatment and prevention of exsanguination and coagulopathy.

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INTRODUCTION

Trauma is the leading cause of death and disability in adults less than 44 years of age, and has become one of the leading public health concerns globally [1]. With increased focus on the traumatically injured, there has also been an increased focus on the role of anesthesiologists who care for these patients. In 2014, the American College of Surgeons issued its *Resources for Optimal Care of the Injured Patient*, which emphasized that a board-certified (or board-eligible) anesthesiologist must be available to care for traumatically injured patients at all level I and II trauma centers [2]. The report further stated that delays in the provision of anesthesia and control of the airway were quality measures that should be recorded in the hospital performance improvement and patient safety process [2]. In addition, the report stressed that a designated physician anesthesiologist should be the liaison to the institution's trauma program and participate in their performance improvement and patient safety program [2]. This sentiment was echoed at the American Society of Anesthesiologist's House of Delegates meeting in 2014, which approved that level I trauma centers should have a trauma anesthesiology director who not only fulfills the role of trauma liaison but also has some significant training or experience in caring for the traumatically injured and participates in continuing education by earning at least 12 trauma-related continuing medical education credits every three years [3].

Multiple patient care spheres involving anesthesiology are evolving and helping to refine the care of patients with trauma. In the area of airway management, controversy exists as to whether patients should be intubated in the field before being brought to the hospital. Studies are being performed involving apneic oxygenation, which has the potential to stave off hypoxia during prolonged intubation attempts in the critically injured. The understanding of the acute coagulopathy of trauma has also improved since it was first described. It is now known that the endothelium plays a significant role and that tissue hypoperfusion leads to a hyperfibrinolytic state [4]. With better understanding of traumatic coagulopathy, new therapies (including antifibrinolytics and factor concentrates) have been studied and there has been a push for laboratory value-driven therapy. However, the treatment of abnormal hemostasis is only one piece of so-called damage control resuscitation. Other goals include volume resuscitation and prevention of hypothermia, while minimizing crystalloid administration and maintaining a low normal blood pressure.

TRAUMA AIRWAY MANAGEMENT

The "Advanced Trauma Life Support" manual recommends that airway maintenance with cervical spine immobilization be the first priority for patients who have sustained life-threatening injuries [5]. Problems with the airway and respiratory management are some of the most common errors that contribute to the death of patients with trauma [6]. In one review of 2594 deaths of patients with trauma, failure to successfully intubate, secure, or protect the airway caused 16% of inpatient deaths [7]. Airway management for patients with trauma