

Thoracic Trauma

Injuries, Evaluation, and Treatment



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KEYWORDS

- Thoracic trauma • Penetrating • Blunt • Primary survey
- Emergency department thoracotomy

KEY POINTS

- A focused primary survey is essential in the diagnosis and rapid treatment of life-threatening injuries in thoracic trauma.
- Thoracic trauma can uniquely benefit from bedside procedures (eg, tube thoracostomy, emergency airway creation, emergency department thoracotomy) to alleviate immediate threat of mortality and allow further definitive treatment.
- Patient stabilization is necessary before definitive surgical intervention is attempted.
- A thorough secondary survey in combination with diagnostic laboratory and radiologic studies will uncover most traumatic injuries.

INTRODUCTION

Thoracic injury is a common and potentially devastating component of acute trauma care. The incidence of such injury is 14% in blunt trauma and 12% in penetrating. Yet, thoracic injuries account for up to a quarter of early trauma-related mortality, second only to head and neck insults.^{1,2} Despite the often serious nature of thoracic trauma, many of these injuries can be quickly diagnosed, and at times mitigated, in the trauma bay.³

PRIMARY SURVEY

The first priority in management of thoracic trauma is evaluation and stabilization of airways, breathing, and circulation (ABC).⁴ This initial primary survey encompasses urgent assessment of the airway, quality of respiration, and stability of circulatory status. When any of these factors is insufficient, urgent intervention must be performed and the primary survey reassessed. Although many trauma victims can benefit from basic

The authors have nothing to disclose. They have no funding sources, or commercial or financial conflicts of interest regarding the authorship and publication of this article.

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Surg Clin N Am 97 (2017) 783–799

<http://dx.doi.org/10.1016/j.suc.2017.03.004>

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interventions, emergent bedside surgical intervention is uniquely beneficial in thoracic trauma if performed promptly and appropriately (**Table 1**).

Airway

Assessment and stabilization of the airway is always the first priority in the management of all trauma patients. A great deal of assessment can be based on basic patient appearance and verbalization. However, in the presence of severe injury or diminished mental status, evaluation can be more difficult and should be focused on a combined assessment of oxygenation, ventilation, and airway protection.⁴ Because the mortality of direct airway injury is so high, most of these patients do not reach the emergency room. As such, loss of airway in hospitalized trauma patients is generally due to secondary failure. Diminished mental status, head injury, cervical spine injury, soft tissue neck trauma, facial wounds, and clavicle fractures can all indirectly lead to loss of adequate airway protection.² Initial treatment must include cervical stabilization and proper head positioning with eventual definitive control by endotracheal intubation. If direct airway injury is suspected on primary survey, laryngoscopy can be considered; however, only with the understanding that it is time intensive. If the airway is truly compromised in the setting of suspected injury, an emergency airway is required. The standard method is via cricothyroidotomy due to its speed and ease. The technique can be used in a variety of settings with as little as a scalpel, clamp or bougie, and endotracheal tube. The primary contraindication to this procedure is direct neck injury at the position of the cricothyroid membrane. In this setting, tracheostomy is preferred because its distal location avoids an incision through traumatized soft tissue and reduces the risk of worsening a tracheal disruption.³

Breathing

Following, or paralleling, airway evaluation, the patient's respiratory status must be assessed. In the setting of traumatic thoracic injury, this step is of particular importance because significant compromise may be present and emergent bedside intervention may be indicated. Basic evaluations of respiratory rate, chest wall motion, oxygenation, and breath sounds are performed, as in any trauma. The physician must have a suspicion for pneumothorax in the setting of thoracic injury; in particular, there is concern for a life-threatening tension pneumothorax.

Table 1	
Primary survey: life-threatening injuries and emergent treatments	
Injury	Intervention
Airway obstruction or rupture	Intubation if possible and safe, consideration of cricothyroidotomy vs tracheostomy
Tension pneumothorax	Initial needle decompression followed by definitive tube thoracostomy
Open pneumothorax	Initial 3-sided occlusive dressing followed by wound closure and tube thoracostomy
Massive hemothorax	Volume resuscitation, tube thoracostomy, consideration of emergency thoracotomy
Pericardial tamponade	Pericardiocentesis if the patient is stable, consideration of emergency thoracotomy

A list of the common life-threatening thoracic traumatic injuries that can be diagnosed during the primary survey. If identified or even strongly suspected, the corresponding emergent intervention must be strongly considered.

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