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The Hospital Physician General Surgery Board Review Manual is a study guide for residents and practicing physicians preparing for board examinations in general surgery. Each manual reviews a topic essential to current practice in the specialty of general surgery.

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Blunt and Penetrating Chest Trauma: Initial Evaluation and Management

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INTRODUCTION

Trauma is the fifth leading cause of death for all Americans and the leading cause of death for those under age 44 years.\(^1\)\(^2\) Traumatic injuries account for 180,000 deaths and 9 million disabling injuries in the United States each year.\(^3\) Chest trauma may result from blunt injury, such as a fall or motor vehicle crash, or penetrating trauma, such as a stab or gunshot wound. Management of blunt and penetrating trauma injuries requires expertise in rapid patient assessment, recognition of injuries, stabilization and resuscitation of patients, and provision of definitive care.

Initial management of all trauma patients is guided by the principles taught in the American College of Surgeons Committee on Trauma Advanced Trauma Life Support (ATLS) course.\(^4\) These principles provide a common language and approach to initial evaluation and management of the injured patient. Using these guidelines, ATLS emphasizes the ABCDE approach to trauma evaluation (Table 1).

Chest trauma is common in injured patients and contributes to approximately 25% of trauma-related deaths.\(^5\) Although most chest injuries can be treated with simple procedures such as tube thoracostomy, life-threatening injuries must be treated expeditiously. In the ATLS course, major chest trauma is divided into injuries that are “immediately life threatening” and those that are “potentially lethal” (Table 2). This approach is useful for generating a differential diagnosis and helps to guide treatment priorities for patients suffering from chest trauma.

This article provides an overview of the evaluation and management of penetrating and blunt chest trauma in the context of 2 patient presentations. Special attention is paid to specific injuries associated with chest trauma as well as the resuscitation and management of these patients.

PENETRATING THORACIC TRAUMA

CASE 1 PRESENTATION

A 17-year-old male who sustained a gunshot wound to the left chest a short time ago is brought to the emergency department by emergency medical services. Upon arrival, his airway is patent, he has diminished breath sounds over the left chest but no crepitus, and his extremities are cool and clammy. He is placed on monitors and his heart rate is 143 bpm, blood pressure is 86/palpable, respiratory rate is 28 breaths/min, and oxygen saturation is 90%. He opens his eyes to pain, is mumbling incoherently, and moves all extremities purposefully. A single bullet wound is seen in his upper left back just above the scapula.

- What are the potential causes of this patient’s shock?
- What are the treatment priorities?

DIAGNOSIS AND TREATMENT OF SHOCK

The patient’s clinical description suggests that he is suffering from shock. There are 4 classic shock states as defined by Blalock in 1934: hypovolemic, septic, neurogenic, and cardiac.\(^6\) With some modifications, this basic differential diagnosis is quite useful. There are 2 categories of shock in the trauma patient—hemorrhagic and nonhemorrhagic, with hemorrhagic shock being most common. The nonhemorrhagic types of shock are cardiogenic, neurogenic, septic, and shock secondary to a tension pneumothorax.\(^4\) Hemorrhagic shock requires rapid diagnosis and initiation of appropriate resuscitation. The other shock states require prompt intervention (ie, needle decompression and chest tube for tension pneumothorax). Potential etiologies of this patient’s shock state include hemorrhage from a penetrating injury to his heart, lung, or great vessels, tension pneumothorax, and pericardial tamponade.