

The “ending neglect” of roentgenograms in penetrating chest trauma

Luca Bertolaccini, Giovanna Rizzardi, Mary Jo Filice, Elvira Spada, Alberto Terzi

Thoracic Surgery Unit, S. Croce City Hospital, Cuneo, Italy

J Thorac Dis 2010; 2: 197-198. DOI: 10.3978/j.issn.2072-1439.2010.02.04.3



Luca Bertolaccini

Thoracic penetrating trauma represents a common and challenging problem, caused either by gunshot or by non-gunshot-related accidents (stabs, traffic accidents, impalements) (1). At present, the role of chest roentgenogram in trauma protocols is debated. Some authors sustain that chest CT scan is the primary study to fully evaluate trauma-associated injuries and to evaluate bony details. Its diagnostic capability is unsurpassed in this setting (2,3). CT scan of the chest has been increasingly used for trauma. Studies have shown that CT scan may demonstrate significant disease in patients with normal chest X-ray (4,5). Furthermore, CT has been credited for change management strategy in up to 20% of chest trauma patients with abnormal standard radiographs. CT scan is more accurate than standard radiography for the evaluation of pulmonary contusion, thereby allowing early prediction of respiratory compromise (6). Chest radiography is the first-line imaging examination in patients with thoracic trauma. Proper interpretation is essential for accurate diagnosis and treatment and can render additional studies unnecessary (7,8). When patients are in critical condition, chest radiography may be the only imaging examination that can feasibly be performed without risking further injury or decompensation (9). Ideally, chest radiographs should be obtained in the postero-anterior and lateral views with the patient sitting upright and in full inspiration. However, trauma patients often must be imaged in the supine position, which complicates injury visualization and localization. Single-view antero-posterior radiographs do not provide the ability to distinguish superimposed soft-tissue and bone lesions from underlying viscera. Air-fluid levels are not visible because of the perpendicular orientation of the x-ray beam. Poor inspiratory effort and magnification effects can produce pseudocardiomegaly and apparent increases in pulmonary vascularity. Nevertheless, when analyzed with respect to these limitations, the chest radiograph can be an invaluable tool that provides a wide spectrum of information regarding a number of organ systems (10). Subsequently, chest radiograph is the most common imaging study that is performed in patients who have penetrating thoracic injury. With the introduction of CT technology, significant advances have been made in the ability to obtain high-resolution volumetric data during peak vascular contrast enhancement in patients who have penetrating chest injuries. This development has resulted in a marked increase in the number of hemodynamically stable sustaining penetrating chest traumas that are imaged with CT. Improved image quality and manipulation of volumetric data allow a more accurate diagnosis of the extent and course of penetrating injury, and often allow delineation of the precise injuries that have been sustained. Bedside ultrasonography has been used in emergency medicine for more than 15 years (11). Emergency physicians successfully have integrated ultrasound (US) as the primary imaging modality for a number of emergent disorders. Of the well-established indications for bedside US, it is clear that the trauma patient benefits significantly from the use of this technique. Many life-threatening

No potential conflict of interest.

Corresponding Author: Luca Bertolaccini, MD, PhD. Thoracic Surgery Unit, S. Croce City Hospital, Via Michele Coppino 26, Cuneo 12100, Italy. Phone: +39-0171-642286; Fax: +39-0171-642491. E-Mail: luca.bertolaccini@unito.it.

Submitted Aug 10, 2010. Accepted for publication Oct 4, 2010.

Available at www.jthoracdis.com

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disorders can be encountered in patients with chest trauma and, therefore, a rapid and thorough evaluation is compulsory. Chest radiography is essential and can detect many injuries including hemothorax, pneumothorax, diaphragmatic rupture, and rib fractures. CT has demonstrated excellent sensitivity and specificity in diagnosing this entity and other serious chest injuries. Despite these advancements, however, some injuries can remain undetected.

Chest X-ray still plays an important role in the initial evaluation of blunt and penetrating chest trauma, providing rapid imaging information to supplement the history and physical examination. In the emergency department, familiarity with the spectrum of injuries that can occur in the chest is important for accurate interpretation of chest radiographs as well as establishment of appropriate recommendations for management and follow-up.

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