

WHY WE MISS THEM: CT DISTRIBUTION OF OCCULT VERSUS OVERT PNEUMOTHORACES

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Purpose: The supine chest x-ray (CXR) is an insensitive test for post-traumatic pneumothoraces (PTXs), as computed tomography (CT) often identifies PTXs not detected on CXR (occult pneumothoraces or OPTXs). Despite other “soft” signs, CXR diagnoses typically require visualization of a lateral pleural stripe, or a deep diaphragmatic sulcus. Ultrasound (US) is a new method for detecting OPTXs that examines specific thoracic locations, such as the anterolateral chest. As the intra-thoracic distribution of OPTXs has been previously poorly described, the purpose of this study was to define the size, distribution, and implications of OPTXs.

Methods: CTs (digitally archived) of all trauma patients admitted with an ISS \geq 12, over 12 months, were reviewed for OPTXs. OPTXs were classified according to their apical, basal, anterior, lateral, and posterior components. Prospective databases and charts were analyzed to determine demographics, treatments, and outcomes. Statistical significance on T or Fischer’s exact test was < 0.05 .

Results: CT scans were obtained in 338 of 761 (44%) of patients; bluntly injured in 98.5% of cases. One hundred PTXs were present in 89 patients; 49% were OPTXs. PTXs were distributed as 49% apical, 6% apical only, 94% anterior, 73% basal, 55% lateral and 2% posterior; while OPTXs were 45% apical, 12% apical only, 86% anterior, 39% basal, 22% lateral and 0% posterior. This distribution was significantly different for apical only, lateral, and basal locations ($p < 0.05$).

Conclusions: CXR missed half of all PTXs. This is likely due to the significantly different intra-thoracic localization of OPTXs. OPTXs have lateral and basal components less than half as often, but apical only location twice as frequently as PTXs. The most frequent OPTX location was anterior, which is an easily accessible US window. Until further US experience is available, CT scans should be routine in patients with severe blunt trauma.