Early lung ultrasonography predicts the occurrence of acute respiratory distress syndrome in blunt trauma patients

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Résumé en anglais	PURPOSE: Extent of lung contusion on initial computed tomography (CT) scan predicts the occurrence of acute respiratory distress syndrome (ARDS) in blunt chest trauma patients. We hypothesized that lung ultrasonography (LUS) on admission could also predict subsequent ARDS. METHODS: Forty-five blunt trauma patients were prospectively studied. Clinical examination, chest radiography, and LUS were performed on arrival at the emergency room. Lung contusion extent was quantified using a LUS score and compared to CT scan measurements. The ability of the LUS score to predict ARDS was tested using the area under the receiver operating characteristic curve (AUC-ROC). The diagnostic accuracy of LUS was compared to that of combined clinical examination and chest radiography for pneumothorax, lung contusion, and hemothorax, with thoracic CT scan as reference. RESULTS: Lung contusion extent assessed by LUS on admission was predictive of the occurrence of ARDS within 72 h (AUC-ROC = 0.78 [95 % CI 0.64-0.92]). The extent of lung contusion on LUS correlated well with CT scan measurements (Spearman's coefficient = 0.82). A LUS score of 6 out of 16 was the best threshold to predict ARDS, with a 58 % [95 % CI 36-77] sensitivity and a 96 % [95 % CI 76-100] specificity. The diagnostic accuracy of LUS was higher than that of combined clinical examination and chest radiography: (AUC-ROC) 0.81 [95 % CI 0.50-1.00] vs. 0.74 [0.48-1.00] (p = 0.24) for pneumothorax, 0.88 [0.76-1.00] vs. 0.69 [0.47-0.92] (p < 0.05) for lung contusion, and 0.84 [0.59-1.00] vs. 0.73 [0.51-0.94] (p < 0.05) for hemothorax. CONCLUSIONS: LUS on admission identifies patients at risk of developing ARDS after blunt trauma. In addition, LUS allows rapid and accurate diagnosis of common traumatic thoracic injuries.

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