

Computer-aided system effectively detects and measures pneumothoraces in chest trauma patients

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A new computer-aided method used with MDCT to detect and measure pneumothoraces in trauma patients helps physicians make quicker and more accurate decisions in busy emergency room settings, according to a study performed at Massachusetts General Hospital and Harvard Medical School in Boston, MA.

"With the rapid development of multi-detector CT, such as 64-slice MDCT, CT scanning of trauma patients replaced traditional x-ray radiography in emergency care and is becoming the primary trauma survey in many clinical institutions," said Wenli Cai, PhD, lead author of the study. "The treatment of pneumothorax, in addition to the patient's clinical presentation, is determined based upon the size of the pneumothorax. So far, there has been no established or reliable method for accurately and efficiently determining pneumothorax size. This inspired us to investigate a tool for measuring pneumothorax size in trauma patients," said Dr. Cai.

The study included 68 patients with occult pneumothorax. A total of 83 pneumothoraces were identified and their size was measured manually using MDCT images. The study compared the computer-aided results to the manual volumetric measurements for individual pneumothoraces and found that the computerized method was just as accurate as the manual one. Moreover, the computer-aided method took an average of three minutes, whereas it took about half an hour to an hour for manual

measurement.

Thirty to 39% of all patients suffering from chest trauma have pneumothorax. "It is a critical condition and it is important for physicians to be able to make quick and accurate decisions regarding treatment. The computer-aided method can help out in the decision making process by providing an important and essential index of the need for treatment," said Dr. Cai.

"Aside from being quick and accurate, MDCT and the computer-aided method may help avoid unnecessary surgeries, too. When the pneumothorax is small and the patient is stable, physicians do not need to perform surgery. The computer-aided quantification method can quickly show us how large the pneumothorax is and give accurate monitoring information over the course of several days," said Dr. Cai.

More information: This study appears in the March issue of the *American Journal of Roentgenology*.

Source: American Roentgen Ray Society

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