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Condensed from 15 Years Ago:

Resolution Rates of Pulmonary Embolism Assessed by Serial Positron Imaging with Inhaled Oxygen-15-Labeled Carbon Dioxide

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Embolus obstruction of pulmonary blood flow results in delayed regional clearance of inhaled $^{15}\text{CO}_2$. Focally retained $^{15}\text{CO}_2$ appears as zones of increased ^{15}O activity on serial positron scintigrams, which show the locations of occluded pulmonary segments. Inhalation of $^{15}\text{CO}_2$, with serial imaging by a multicrystal positron camera, was used to locate and assess the magnitude of occluded pulmonary segments in eight patients with arteriographically documented pulmonary emboli. Imaging with $^{15}\text{CO}_2$ inhalation was repeated after 1

wk of i.v. heparin therapy to evaluate the ability of this technique to determine resolution rates of pulmonary emboli during anticoagulant therapy. In all patients, zones of increased $^{15}\text{CO}_2$ activity corresponded with sites of emboli identified arteriographically. After 1 wk of continuous heparin therapy, zones of focally retained $^{15}\text{CO}_2$ were totally resolved in three patients, diminished in four and unchanged in one. The regional pulmonary clearance rate of $^{15}\text{CO}_2$ was delayed over embolized pulmonary segments in all patients (mean clearance half-time = $42.2 \text{ sec} \pm 11.2 \text{ s.e.m.}$) and improved after heparin therapy ($13.9 \pm 3.9 \text{ sec}$; $p < 0.05$). Serial $^{15}\text{CO}_2$ inhalation imaging is a rapid noninvasive radionuclide technique for detection of pulmonary emboli. It can be repeated at frequent intervals to assess the resolution of emboli during anticoagulant therapy.

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