Changes in Perfusion and Ventilation Following Bronchography

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Lung scans of perfusion and ventilation before and after bronchography were obtained in patients with various lung diseases and arterial blood gases including pH, Pco₂, Po₂ and bicarbonate were also measured. Activity of the right and left lungs was estimated with the help of a digital computer.

In eight patients, perfusion studies were performed with the intravenous injection of 200 to 300 μCi 131I-MAA and arterial blood gases were measured before and after bronchography.

After bronchography, in all patients perfusion on the side on which the bronchogram had been carried out was reduced.

Just after bronchography Po₂ was reduced but pH, Pco₂ and bicarbonate were unchanged. After two hours Po₂ returned to normal level.

Two patients had perfusion studies and arterial blood gas measurements before and after bronchial catheterization and anesthesia. Significant changes were not observed in perfusion and arterial blood gases.

Three patients had perfusion and ventilation studies before and after bronchography. Ventilation studies were performed with the inhalation of 3 to 5 mCi ⁹⁹mTc-albumin.

The distribution of perfusion and ventilation was both affected by bronchography, but we were unable to demonstrate any relationship between the reduction in perfusion and the reduction in ventilation.

Although the mechanism responsible for the development of perfusion defects following bronchography has not been conclusively established, it seems that bronchial obstruction produces local vasoconstriction by a decrease in regional alveolar oxygen concentration.

Another possibility is that irritation by contrast material causes a reflex vasoconstriction.

Regional Pulmonary Function Studies with ¹³³Xe


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Regional pulmonary function studies were performed during normal breathing at rest with a scintillation camera placed on the back of a sitting subject.

Procedure of a single breath of 5–10 mc Xe gas and washout in the open circuit was performed in ventilation studies (breath-hold 10 seconds). In the perfusion studies, intravenous injection of 5 mc Xe dissolved in saline and equilibration procedure in the closed circuit was performed (breath-hold 15 seconds).

In both ventilation and perfusion studies, each