Discussion

Dr. David C. Sabiston, jr. (Durham): Dr. McLachlin, Members and Guests: I would like to commend Dr. Miller and his associates at the University of Pennsylvania for this exemplary group of laboratory and clinical observations. These studies are characterized by excellence and by ingenuity. The subject of radioactive pulmonary scanning was introduced, and I would like to make a few comments concerning this technic. In the past 3 years we have found scanning to be a simple, safe, and reliable diagnostic method, not only for pulmonary embolism but for a variety of other cardiopulmonary disorders. However, the method does indeed have limitations.

First, the technic provides essentially *qualitative* data concerning the volume of the pulmonary blood flow, rather than *quantitative* results. Secondly, the present method usually requires 30 to 45 minutes for a satisfactory examination and a period of time is usually desirable which is shorter than this.

I would like to describe briefly some recent studies which Dr. Jones, one of our residents, Dr. Goodrich, and I have done in the laboratory.

(Slide) In this slide one sees a scan performed with the digital autofluoroscope, which simultaneously quantitates radioactivity over each square centimeter of the lung fields. Instead of a single moving scintillation counter, as is conventionally used today, these multiple stationary detectors of this instrument represent 94 individual scintillation crystals, each with a 1 cm square face surface. Simultaneous counts per unit of time for each of these 294 crystals are transferred to magnetic core storage. These digital data may then be placed on computer tape and displayed on an oscilloscopic screen.

The matrix on the oscilloscope screen, which corresponds to the detector matrix, is eliminated proportionately to the count density of each crystal, and that is what one sees on this scan with radioactive macroaggregation on serum albumin.

(Slide) One sees here a normal scan with the digital read-out below. You will not be able to read the individual figures, but they give pulmonary flow in milliliters per minute for each square centimeter. One can detect it, then, for one lung, or for a part of the lung. Thus it is possible to add a figure of quantitation to pulmonary flow.

Moreover, the entire scanning can be completed in a period of 20 seconds. It is our belief that the quantitation and speed provided by the digital autofluoroscope, with direct computer analysis, strengthen the use of this technic, especially in the future.

(Slide) This is a read-out on an animal that has occlusion of the left main pulmonary artery by a balloon, and one can see the picture on the fluoroscopic screen on your right, with the regular scan in the center; and again a digital readout is available for this data.

Again, I would like to commend Dr. Miller and his associates on their successful application of a new concept in the diagnosis of pulmonary embolism and for their critical analysis of the laboratory and clinical aspects of this important study. Thank you. (Applause)

Dr. L. D. Miller (Closing): I can do nothing but thank Dr. Sabiston for his very kind remarks, and to once again hope that this will be a significant contribution, after further evaluation and verification, to a very prevalent and lethal problem. Thank you.