tion camera. The subjects breathed naturally in an open circuit system. A solution of xenon in saline was infused for 10 minutes at a rate of 2 ml per minute into an antecubital vein by a Harvard pump. After steady radioactive count rates in the lungs had been obtained, the infusion pump was turned off and the subjects cleared the xenon from the lungs. When washout was judged complete, 3 mCi of xenon was infused into antecubital vein and while breath-holding was performed during 20 seconds, perfusion pattern was obtained. Then the subjects breathed from a closed spirometer circuit until count rates in the lungs was constant. When the subjects were turned out of the closed circuit and allowed to breathe room air. In order to obtain ventilation pattern, the subject inhaled 800–1000 ml of xenon gas from FRC level and held breath during 20 seconds.

Theoretically, if a solution of xenon is infused intravenously at a constant rate, and if steady state is attained, regional alveolar xenon washed in from regional blood flow is equal to the xenon washed out with regional alveolar ventilation. In other words, regional $V_A/Q$ is the reciprocal of regional xenon concentration and regional $V_A/Q$ distribution is graphically obtained by dividing regional count rates under constant infusion by the regional lung volume. Regional $V_A/Q$ obtained by this method was compared with the geographical figure obtained by dividing regional ventilation count rates by regional perfusion count rates. The geographical difference was pointed out, which seemed to be originated from the neglect of vertical $V_A/Q$ unevenness against scintillation camera.

**Studies on Regional Blood Flow of Delayed Deltopectoral Flap**

*Using the Local Clearance Method of Xenon-133*

—Comparison with Medical Thermography—

Y. Tsuchida*, M. Uchida, S. Kamata*, A. Tsuya**, S. Ogawa** and K. Kaneta**

*Department of Otorhinolaryngology, Cancer Institute Hospital*  
**Department of Radiology, Cancer Institute Hospital

In the surgical treatment of head and neck cancer, reconstructive surgery has been able to repair surgical defect safely with a skin flap, especially deltopectoral flap. Nevertheless, delayed deltopectoral flaps resulted in major necrosis in some cases and the cause has been thought to be closely associated with insufficient blood supply.

Recently, the relationship between skin blood flow and skin temperature has been studied generally by thermography as the measurement of circulation of a skin flap.

This problem was studied using the local clearance method of Xenon-133 for these three years at the Cancer Institute Hospital.

Skin temperature on both sides of the deltoid region was measured in cases of delayed deltopectoral flap after the operation. Regional blood flow of delayed deltopectoral flaps decreased once, and mostly recovered to preoperative level 3 weeks later. On the contrary, skin temperature of delayed deltopectoral flap was high in a week and the difference of skin temperature was not found on both sides of the deltoid region 3 weeks later.

Consequently the relationship between skin temperature and regional blood flow of delayed deltopectoral flap was not corresponded, and the change of skin temperature after the operation was thought to be associated with the reaction of the tissue.