## The Experimental Study of Muscular Clearance Using Radioisotope

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Recently much attention has been paid to the peripheral circulation of patients under hypothermia and the microcirculation of patients with edema. In this study, the ratio of static muscular clearance to kinetic muscular clearance was investigated on normal dogs and dogs with ligation of femoral artery. Muscular clearance t½ of dogs with experimental head injuries was also measured with scintilltion counter.

Method: Using adult dogs, experimental cerebral compression and contusion were made by insertion of balloon into the subdural space and by insertion of blood (5.0 ml) into the intracerebrum. $^{131}$I-Na 3$\mu$c was perpendicularly injected into gastrocnemius 1cm deep under nembutal anesthesia. Muscular clearance was measured with scintillation counter and recorder, and making the recorded curve into semi-logalithm table, t½ was calculated.

Result: In normal dogs, static muscular clearance t½ was average 4.6 minutes, and kinetic muscular clearance t½ was average 3.4 min. The ratio was 1.35. In dogs with ligation of femoral artery, the muscular clearance was prolonged immediately after ligation—static muscular clearance t½ was 7.6 min, and kinetic, 8.1 min. and the ratio was 0.94. But the muscular clearance recovered as time elapsed though the ratio was not beyond 1.0. In cases of cerebral contusion, muscular clearance showed almost the same time as normal, and 2 to 4 days after the operation, it was a little prolonged and after that became gradually normal. In cases of cerebral compression, remarkable difference in clearance time was not recognized.

# Symposium I. Organ Scanning

## Scanning Techniques and Pancreas Scanning

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A. Scanning Techniques

The factors to be considered for evaluating scan images are 1) detecting system, 2) display system and 3) choice of radioisotopes and their compounds.

1. Detecting system

(1) Detectors
- (a) Moving type
  - (i) Area scanning
  - (ii) Section scanning (Kuhl)
  - (iii) Cylindrical scanning (Kuhl)
- (b) Stationary type
  - (i) Scintillation camera (Anger)
  - (ii) Autofluoroscope (Bender)
  - (iii) Autofluorograph (Ter-Pogossian)
  - (iv) Gamma-ray camera (Kellershohn)

(2) Collimators
- (a) Types
  - (i) Cylindrical type
  - (ii) Tapered type
  - (iii) Honey comb type
- (b) Shielding
  - (i) High energy type
  - (ii) Medium energy type
  - (iii) Low energy type

While the moving-detector type scanner has an advantage of high resolution, the stationary type, such as a scintillation camera, requires very little time for scanning and enables to record serial variations of radioisotope distribution in organ with period of minutes.

2. Display system
- (a) Color scanning
  - (i) Color scanning (Mallard)
  - (ii) Multicolor printout (Hine)
  - (iii) Colored multiscintigram (Ozeki)
  - (iv) Color recording system (Kakehi)