A Simple Method for the Simultaneous Recording of Blood Flow and Absorption in Isolated Segments of Dog Intestine

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For the in-vivo investigation of absorption, various methods have been developed in various experimental animals. These methods generally consist of perfusing the isolated intestinal segment with various test solutions, or of injecting the solution into an intestinal loop which is closed at both ends and washed out after a certain time. In both cases, the rate of absorption can be estimated from the amount of material that has disappeared from the bowel.

A new technic was devised attempting simultaneous investigation of the absorptive capacity and the blood flow of a segment of the small intestine. With this technic, the effects of the local blood supply and of the local administration of drugs on the absorptive capacity of the jejunum can be studied.

METHOD

With the dog under choloralose anesthesia, a midline incision is made and the small intestine exposed. A jejunal segment—just caudal to the ligament of Treitz, supplied by a single artery with its branches—is isolated. Denervation is completed in the process of preparing the vein for the cannulation. A 2- to 4-mm. diameter polyethylene tube, corresponding to the lumen of the vessel, is inserted into the prepared vein. To prevent coagulation, 5000 U. heparin per 10 kg. body weight is given to the animal simultaneously with insertion of the cannula. If it is necessary to introduce drugs into the circulation of the isolated intestinal loop during the experiment, the collateral artery is first prepared by ligating its proximal end and inserting a small polyethylene tube in the distal direction (Fig. 1). A small needle connected to a tuberculin syringe is inserted into the polyethylene tube. (The tuberculin syringe is used to prevent arterial bleeding.) A glass cannula with a rubber appendage is inserted
Recording Intestinal Absorption

into both ends of the isolated intestinal loop. The mesentery is separated by incision.

A mercury blood-pressure gauge is introduced into one femoral artery. A cannula is inserted into the other femoral artery for the collection of

![Diagram of blood flow and absorption in isolated segments of intestine.]

**Fig. 1.** Arrangement for simultaneous recording of blood flow and absorption in isolated segments of intestine.

the blood sample. Another cannula is inserted proximally into one of the femoral veins for the injection of various substances such as blood, physiological saline solution, etc., during the experiment.

**Measurement of Flow**

The blood flow of the isolated loop is estimated by measurement of the amount of blood flowing away from the vein during the experimental period. At the end of each period, the blood is reinfused into the femoral vein. In order to prevent cooling, the rubber tube of the infusion apparatus is led through a water bath of 38°-40° C.

**Introduction of Drugs**

Infusion of drugs is made at a constant rate, usually of 0.5–2 ml./15 min.