

BLF22 Surgical Protocol

Intestinal Serosa Blood Perfusion Measurement in Dogs

APPLICATION BASICS

Site: Intestinal serosa & mucosa
 Species: Dog, mongrel
 Weight: 11 - 19 kg
 Duration: Acute
PROBE TYPE: S straight with Balance Arm, Probe Holder

Application

Basic research in laser Doppler. Applied laser Doppler research on the effects of various substances on intestinal serosal perfusion.

Surgical Approach

Withhold food from the dog for 24 hours before surgery. Induce anesthesia with sodium pentobarbital (25 mg/kg, IV). Maintain anesthesia during surgery and throughout the experiment with additional sodium pentobarbital (IV). Perform a tracheotomy and insert an endotracheal tube. Provide intratracheal insufflation with a respirator. Perform a median laparotomy. Catheterize the femoral artery to supply blood for a reservoir.

(Continued on back.)

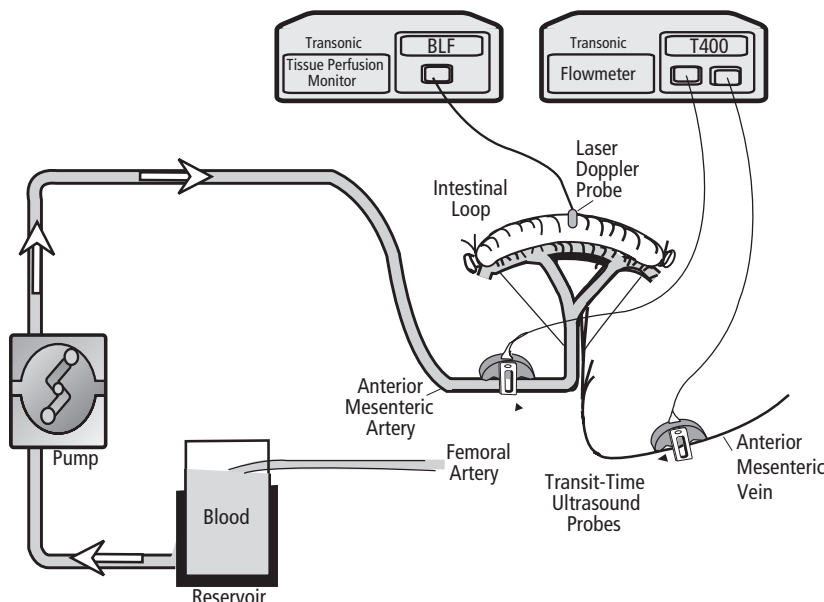


Fig. 1: Simultaneous perfusion measurement of serosal surface of the prepared intestinal and transit-time ultrasound volume flow measurements of the branch of the anterior mesenteric artery and anterior mesenteric vein.

Type S (ABLPHS)



Titanium tip
 Diameter: 6 mm
 Length: 6 mm

Flow Ranges Observed

Serosal Tissue Perfusion:
 0 - 70 TPU

Anterior Mesenteric Artery:
 0 - 45 mlmin⁻¹

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REFERENCES

Kashima S, Oka S, Ishikawa J, Hiki Y, "Measurement of Tissue Blood Volume by Laser Blood Flowmetry," J Jap Soc Laser Med 1991; 12: 3-9.

Intestinal Serosa Blood Perfusion Measurement in Dogs cont.

Select an intestinal loop for isolation which is supplied by a single main branch of the anterior mesenteric artery. Ligate and catheterize this arterial branch and perfuse with blood from the reservoir at rates controlled by means of a roller pump.

Ligate the intestinal loop and resect at both ends. To exclude collateral blood flow, isolate from all adjacent mesentery and peripheral vasculature but leave intact the anterior mesenteric vein draining the loop.

LASER-DOPPLER PROBE PLACEMENT

Place the Laser Doppler Probe on the serosal surface of the prepared intestinal loop using a balance mechanism (see LD-106-tn) applying a pressure of about 0.1 g/mm^2 .

TRANSIT-TIME ULTRASOUND FLOWPROBE PLACEMENT

Apply transit-time ultrasound Flowprobes to the branch of the anterior mesenteric artery supplying the bowel loop and the vein draining it.

SIMULTANEOUS MEASUREMENTS: LASER DOPPLER PERFUSION & TRANSIT-TIME ULTRASOUND FLOW

Set the pump output at a low flow rate. Allow the system to equilibrate and then record the volume flow from the transit-time ultrasound Flowmeter and the perfusion reading from the Tissue Perfusion Monitor. Increase the pump output and again record volume flow to the loop and microvascular perfusion. Repeat to cover the range of flows of interest.



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