

BLF22 Surgical Protocol

Pancreatic Blood Perfusion Measurement in Dogs

APPLICATION BASICS

| | |
|--------------------|----------------|
| Site: | Pancreas |
| Species: | Dog, mongrel |
| Weight: | 13 - 18 kg |
| Duration: | Acute |
| PROBE TYPE: | R: right angle |

Application

To study physiological effects of neuropeptides and other agents on pancreatic and splanchnic circulation.

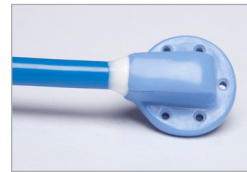
Surgical Approach

Fast the dog for 18 hours prior to anesthesia. Anesthetize with sodium pentobarbital (30 mg/kg, IV). Perform a tracheotomy and insert an endotracheal tube. Provide positive pressure ventilation using a respirator. Maintain anesthesia during surgery and the experiment with additional sodium pentobarbital. Maintain body fluids using a continuous infusion of 0.15 M NaCl (80 ml/hr). Maintain the body temperature with a warming lamp. Tie the pylorus with a silk ligature and drain gastric juice through a gastric tube. Cannulate the common bile duct to prevent the entry of bile into the duodenum. Cannulate the main pancreatic duct using a polyethylene catheter. Ligate the lesser pancreatic duct and collect the pancreatic juice.

Ultrasonic transit-time Flowprobes (Transonic Systems Inc.[®]) were placed on the superior mesenteric artery (SMA) and the portal vein (PV) for simultaneous measurement of volume blood flow.

Place a Laser Doppler Type R Probe on the right lobe of the pancreas. Attach the Probe to the pancreas with double adhesive tape or cyanoacrylate glue (Nexaband[®] Tri-Point Medical, Raleigh, NC). [Alternately, use an 11 gauge needle Probe and a "balance arm" Probe holder as described in LD-106-tn.] Avoid putting pressure on the pancreas with the Laser Doppler Probe as this will occlude the vessels under study. Avoid placing the Laser Doppler Probe directly over a visible blood vessel.

Type R (ABLPHR)



Head: epoxy,
Diameter: 15 mm
Height: 7 mm
Cable: heavy duty

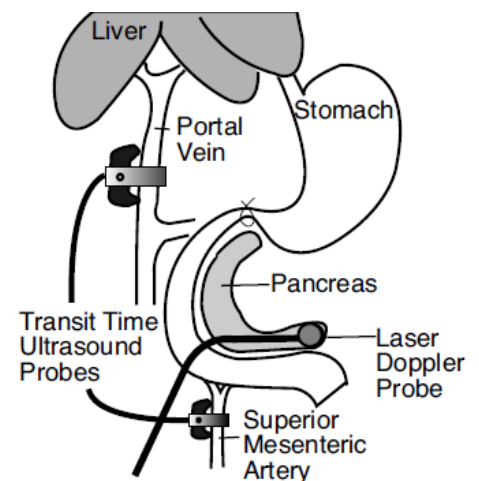


Fig. 1: Placement of a Type R Probe on the pancreas and Transonic[®] ultrasonic transit time Probes on the superior mesenteric artery and portal vein.

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Pancreatic Blood Perfusion Measurement in Dogs cont.

Perfusion Ranges Observed

| INFUSION TYPE | LDF PANCREATIC MICRO-CIRCULATION* | SMA BLOOD FLOW | PORTAL VEIN BLOOD FLOW | SYSTEMIC ARTERIAL BP |
|--|-----------------------------------|----------------|------------------------|----------------------|
| ¹ Kassinin, 0.1 µg/kg | initial: +33% prolonged: +5% | +94% | +90% | -25% |
| ² Neuromedin-N, 1 µg/kg | +33% | +50% | +30% | -5% |
| ³ Neuromedin U-8, 10 ng/kg | +12% | -42% | -30% | + (slight) |
| ³ Neuromedin U-25, 10 ng/kg | +14% | -41% | -35% | + (slight) |

*LDF recorded with a laser Doppler made by another manufacturer.

REFERENCES

Doi R, Inoue K, Kogire M, Sumi S, Takaori K, Yun M, Yajima H, Tobe T, "Effects of Synthetic Kassinin on Splanchnic Circulation and Exocrine Pancreas in Dogs," *Peptides*, 1988; 9: 1055-1058.

Sumi S, Inoue K, Kogire M, Doi R, Takaori K, Yajima H, Suzuki T, Tobe T, "Effect of Synthetic Neuromedin-N, a Novel Neurotensin-Like Peptide, on Exocrine Pancreatic Secretion and Splanchnic Blood Flow in Dogs," *Neuropeptides* 1987; 9: 247-255.

Sumi S, Inoue K, Kogire M, Do R, Takaori K, Suzuki T, Yajima H, Tobe T, "Effect of Synthetic Neuromedin U-8 and U-25, Novel Peptides Identified in Porcine Spinal Cord, on Splanchnic Blood Flow in Dogs," *Life Sciences* 1987; 41: 1585-1590..



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