T400-Series Surgical Protocol

Rabbit Renal Artery: Chronic Blood Flow Measurement

APPLICATION BASICS

Site:	Renal artery
Species:	Rabbit
Weight:	3 - 3.5 kg
Duration:	Chronic, (<12 months)
Vessel Diameter:	1 mm

PROBE

Size:	2 mm (side exit)
Reflector:	J with sliding cover
Connector:	4-pin
Cable Length:	60 cm
Catalog #:	MC-2PSB-JS-WC60-CM4B-GC

FLOWMETER

TS420 Perivascular Module

Flow Ranges Observed

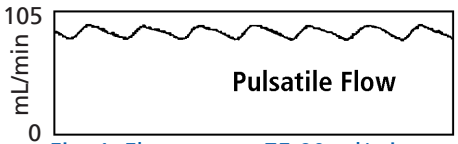

Fig. 1: Flow range: 75-90 ml/min.

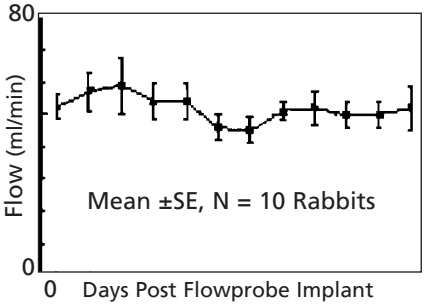

Fig. 2: Compiled from 10 chronically instrumented rabbits weighing between 3.0 and 3.5 Kg.

Application

The measurement of renal blood flow has an important role in research on hemodynamics, electrolyte regulation and pregnancy induced hypertension. This protocol was used to study the interactions of angiotensin II and a cyclooxygenase inhibitor. Flow-pressure relationships are essential in defining renal autoregulation. Other studies have focused on diuretics, cardiovascular drugs, and nephrotoxic agents. While average renal flow may also be obtained from the renal vein, the pulsatile waveform of the renal artery provides additional information and visual confirmation of a functioning chronic implant.

Surgical Approach

Use normal saline to prepare a 1:20 dilution of ketamine as the normal concentration of ketamine is 100 mg/ml. The rabbit may be anesthetized with an initial dose of 3 mg/kg Rompun (xylazine) IV followed by 1 mg/kg ketamine IV of the 1:20 dilution of ketamine. Administer ketamine dilution as needed to maintain anesthesia. A preoperative antibiotic such as 0.07 gm/kg Kefzol is recommended.

Shave the midscapular region as well as the left flank. Position the anesthetized rabbit in right lateral recumbency. Scrub the area and make a 6 cm skin incision starting 2 cm below the last rib and 2 cm lateral to the spine. Use a needle driver to make a subcutaneous tunnel from this incision to the midscapular area. Make a second skin incision in the midscapular area and pull the 2PSB Probe, with sliding cover and bracket removed, through the subcutaneous tunnel to the primary incision. Gently separate the abdominal muscles to expose the retroperitoneal fat and the left kidney. Retract the fatty tissue and kidney laterally, and carefully dissect free a 0.5 cm segment of the renal artery and vein as distal from the kidney as possible. Slide a precut silicone sheet with round edges and with top sutures in place beneath both artery and vein.

(Continued on next page.)

transonic
THE MEASURE OF BETTER RESULTS.

Rabbit Renal Artery: Chronic Blood Flow Measurement Cont.

Surgical Approach cont.

Then slide the Probe around the artery, close and secure the sliding bracket. The proximal ends of the silicone sheet are brought up around the Probe cable and sutured. Sutures are also placed on the lateral sides of the silicone sheet. The silicone sheet has two functions; it keeps fat, a poor acoustical couplant, from infiltrating into the window. It also supports the Probe and helps avoid the pressure points that irritate the vessel.

Close the abdominal muscles with simple interrupted gut, leaving slack in the Probe cable and securing it to the superficial muscle layer. Suture skin incisions and place the standard connector in the side pocket of a jacket available from Clatham or Harvard Apparatus.

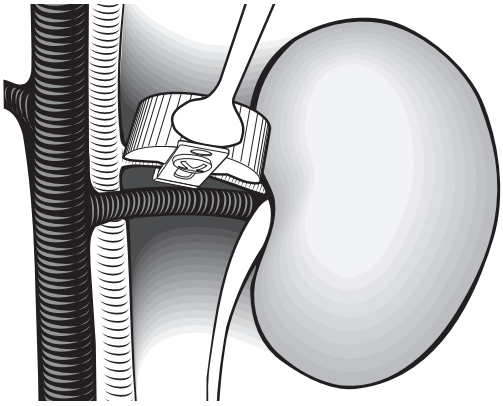

Fig. 1: Flowprobe applied to renal artery.

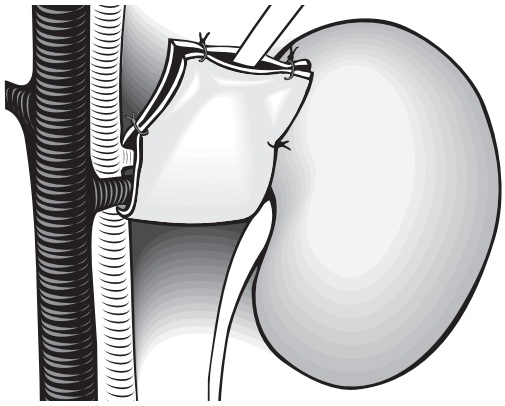

Fig. 2: Flowprobe wrapped in silicone sheath.

ACKNOWLEDGEMENT

Dr. G. Brown, Dr. R. Venuto, with technical assistance of A. Ingeana and J. Helinski. State University of New York at Buffalo, Kimball Tower, 3435 Main Street. Buffalo, NY 14214, Departments of Nursing and Medicine.

REFERENCES

Brown GP, Venuto RC., "Measurement of Renal Blood Flow of Conscious Rabbits Utilizing Ultrasonic Flowprobes: The Effect of Cyclooxygenase Inhibition," Central Society for Clinical Research 1989; 37: 950A.

AMERICAS
Transonic Systems Inc.
34 Dutch Mill Rd
Ithaca, NY 14850
U.S.A.
Tel: +1 607-257-5300
Fax: +1 607-257-7256
support@transonic.com

EUROPE
Transonic Europe B.V.
Business Park Stein 205
6181 MB Elsloo
The Netherlands
Tel: +31 43-407-7200
Fax: +31 43-407-7201
europe@transonic.com

ASIA/PACIFIC
Transonic Asia Inc.
6F-3 No 5 Hangsiang Rd
Dayuan, Taoyuan County
33747 Taiwan, R.O.C.
Tel: +886 3399-5806
Fax: +886 3399-5805
support@transonicasia.com

JAPAN
Transonic Japan Inc.
KS Bldg 201, 735-4 Kita-Akitsu
Tokorozawa Saitama
359-0038 Japan
Tel: +81 04-2946-8541
Fax: +81 04-2946-8542
info@transonic.jp