T400-Series Surgical Protocol

Dog Renal Artery: Chronic Blood Flow Measurement

APPLICATION BASICS

Site:	Renal Artery
Species:	Dog
Weight:	15 kg
Duration:	Chronic
Vessel Diameter:	2.5 mm

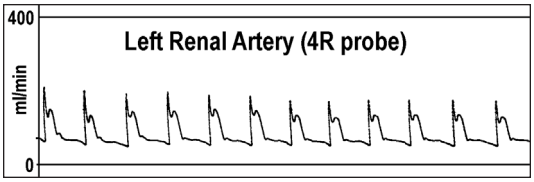
PROBE

Size:	3 mm
Connector:	10-pin
Reflector:	L with sliding cover
Cable Length:	1 meter
Catalog #:	MC-3PSS-LS-WC100-CRS10-GC

FLOWMETER

TS420 Perivascular Module

Flow Ranges Observed



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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 test potential antihypertensive agents. Other studies have focused on diuretics 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.

Variations of this protocol include a ventral approach for situations where access to both kidneys is desired or other protocols require a laparotomy. One experienced researcher sutures the Probe with the cable facing the opposite direction and a loose suture suspending the Probe from the body wall. Another reports fixing the position of the kidney by suturing the renal capsule to the body wall.

Surgical Approach

Premedicate with 0.02 mg/kg atropine IM, induce with 18 mg/kg thiamylal and maintain on halothane. With anesthetized dog in right lateral recumbency, palpate the left kidney and visualize the location of the renal vessels. Make a 4 cm vertical skin incision over the kidney. Continue the incision by bluntly dissecting through the most superficial muscle layer, the cutaneous trunci, to expose the external abdominal oblique muscle. The external oblique muscle can easily be identified by the caudoventral direction of its fibers.

Bluntly dissect through it to expose the cranioventral fibers of the internal oblique muscle. Continue the dissection through the internal abdominal oblique and the underlying transversus abdominous muscle. Continue the incision through retroperitoneal fat to expose the kidney and renal vessels. Gently dissect the tissue cranial to the hilus of the kidney and identify the renal vessels. Take care not to damage the ureter exiting caudolaterally. Locate the renal artery and place a silk suture around it. Note that the renal artery often bifurcates. Make sure that there isn't another branch. Place a 3 mm Probe around the artery (or paired arteries) and close the sliding bracket. Securing the Probe takes special care because the kidney is mobile and suspended by the vascular pedicle. The objective is to fix the position of the

(Continued on next side.)

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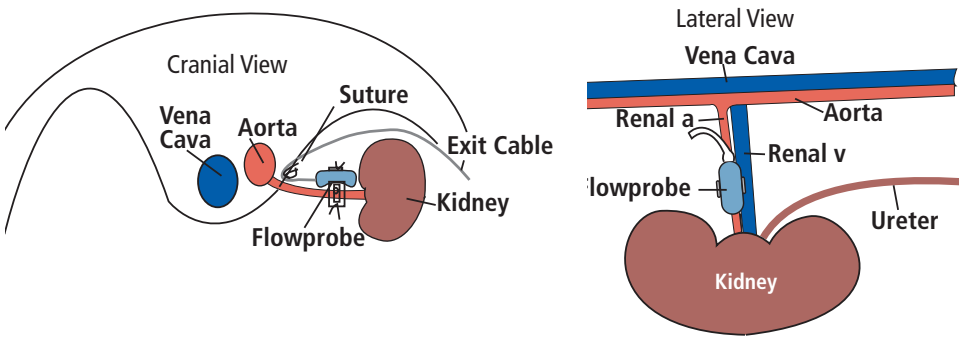
Dog Renal Artery: Chronic Blood Flow Measurement Cont.

Surgical Approach cont.

Probe with respect to the artery without making the Probe support the weight of the kidney. Suture the cable to the body wall close to the point where the renal artery joins the aorta. This position minimizes the strain on the cable when the kidney moves. Place sutures through the bracket suture holes to adjacent connecting tissue. These sutures will limit rotation of the Probe around the artery. Wrapping the Probe with silicone sheet wrap is recommended to stabilize the implant.

Pass the cable through the incision and close each layer of the body wall independently. Create a subcutaneous pouch for the cable and implantable connector. Close the subcutaneous layer and skin routinely. By seven days post surgery, fibrotic tissue effectively seals the tunnel containing the cable. When a flow reading is desired, the dog may be lightly anesthetized to exteriorize the implantable connector.



REFERENCES

Mann, W.A., Kinter, L.B., and Woodward, P., "Selective DA-1 Antagonism of SK&F R-87516-J, Fenoldopam, and Dopamine-Stimulated Renal Vasodilation in Dogs", Federation Proceedings, Vol. 45, No. 3, p. 427, 1986.

Mangino, M.J., Jendrisak, M.D., Brunt, E., Anderson, C.B., "Eicosanoid Synthesis Inhibition and Renal Function during Acute Rejection", Transplantation, Vol. 45, No.5, pp. 902-907, 1988.

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