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SPARC Cat - Sham Control Chronic Cat 1, Day 0

Brett Hanzlicek[1], Margot Damaser[2]

[1]Advanced Platform Technology Center, Louis Stokes VA Hospital, Cleveland, Ohio;

[2]Department of Biomedical Engineering, Cleveland Clinic Lerner Research Institute, Cleveland, Ohio

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ABSTRACT

This is a procedure for a sham control chronic cat experiment (Day 0) for cystotomy (bladder surgery). The cystotomy is performed without UroMOCA implantation. The cat is observed daily and imaged on day 0, 14 and 30 to track changes to the bladder and overall cat health in response to the cystotomy. This protocol includes basic surgery, urodynamics and imaging for Day 0 in the chronic experiments.

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MATERIALS TEXT

Cat - Domestic short-haired cat. Male or female. 6-24 months; 3.5-5.0kg
Syringe Pump - Genie Touch; Kent Scientific
Pressure Transducer - Catalog # 503067
WPI Amplifier - 4 channel transbridge
WPI National Instruments multifunction I/O device - NI USB 6259
National Instruments Laptop with Labview software
Tubing - Masterflex L/S Platinum-Cured Silicone Tubing ID 3/16 "; Cole Parmer
BNC cables
Tubing to catheter - APIS
Laborie Catheter - Argyl Suction Catheter, 3.5 Fr Catalog # 8890703211
Covidien Sutures - 4-0 Vicryl Polysorb (Covidien UL212)
3-0 Prolene (Ethicon 8762)
2-0 Silk Syringe
60ml Contrast
Visipaque 320mg/ml
Surgilube
Surgical instruments

BEFORE STARTING

1 week before start of experiment - Confirm absence of bladder spasm; healthy cat

12 hours before experiment, start fasting the cat

You must transport the animal chart along with the cat to surgery site. The veterinary team will record all relevant data in the chart. The chart must then go back to the housing site.

Transport Cat

1 Transport cat from housing site to surgery site.

Animal Prep and catheter placement

2 Animal is anesthetized and abdomen is shaved by the vet team. The cat is then moved into the surgery room and attached to monitors by the vet team.

3 Drape animal and perform betadine scrub on abdomen and genitals.

4 Put surgilube on 3.5Fr catheter and insert into bladder through the urethra. Advance the catheter until resistance is met, then pull back 2-3cm.

5 Use gentle suction with syringe to withdraw urine from bladder through the catheter. Measure the volume and save the urine for urinalysis.

28 mL urine removed

Cystogram - DYNA CT

6 Use 1:5 dilution of contrast to saline to visualize bladder.

Fill the bladder with **10 mL** contrast and take a single CT image.

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Add **20 mL** more to bladder (total of 30ml) and take single CT image

Take a 3D CT image with 30ml contrast:saline in the bladder

7 Empty Bladder

Urodynamics/Cystometry

8

Performed after cat is transferred from Isoflurane to propofol anesthetic.

Fill rate is 2ml saline/minute using syringe pump.

Data is recorded using Labview software.

Pressure is recorded using an external pressure transducer connected to syringe pump on one end and tubing that leads to the catheter on the other end.

9 Fill bladder with saline and record pressure using pressure transducer connected to LabView

Fill to **19 mL** ; Peak pressure is 4.5 cm H_2O

Fill to **20 mL** ; Peak pressure is 5.0 cm H_2O

Fill to **30 mL**

Fill to **40 mL** ; Peak pressure is 10.7 cm H_2O

Fill to **42 mL** ; Peak pressure is 11 cm H_2O

Fill to **47.5 mL** ; Peak pressure is 20 cm H_2O

10 Empty Bladder

Cat transitioned back to isoflurane

Surgery

11 See protocol titled "SPARC Cat surgery Day 0" for details on accessing and opening the bladder for device insertion.

12 Place device in bladder, suture the bladder closed with 4-5 stitches and add 25 ml of dilute contrast through the catheter. Check for leaks and place bladder back into body.

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13 Take a picture with DYNA-CT and a 3D CT

14 Remove stitches from bladder, remove device and suture the bladder and abdomen per protocol titled "SPARC Cat surgery Day 0"

Urodynamics/cystometry 2

15 Fill bladder with saline at 2ml/min

16 Fill to **4 mL** ; pressure started to rise

Fill to **18 mL** ; peak pressure 10 cm H_2O

Fill to **20 mL** ; peak pressure 10 cm H_2O

Wake and return cat

17 Wait for cat to wake up and return to housing site.

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