A Technician’s Guide to Feline Urethral Obstruction

Jennie Schade, RVT
November 5, 2017
# Feline Lower Urinary Tract Disease

A variety of conditions affecting the bladder and the urethra

<table>
<thead>
<tr>
<th>Causes</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feline Idiopathic Cystitis</td>
<td>Hematuria</td>
</tr>
<tr>
<td>Cystoliths/Crystalluria</td>
<td>Stranguria</td>
</tr>
<tr>
<td>Anatomical abnormalities</td>
<td>Behavior Changes</td>
</tr>
<tr>
<td>(congenital/neoplasia)</td>
<td>Urethral Obstruction</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td></td>
</tr>
<tr>
<td>Trauma</td>
<td></td>
</tr>
</tbody>
</table>
Urethral Obstruction

A common and life threatening complication of lower urinary tract disease, in which an obstruction of the urethra blocks outflow of urine
Urethral Obstruction

- Idiopathic: 53.0%
- Calculi: 29.0%
- Mucus plug: 18.0%
Feline Idiopathic Cystitis

- Sterile inflammation of the bladder
- Unknown cause, but may be related to hormone imbalance caused by stress
- This imbalance leads to impaired blood flow and release of inflammatory mediators
  - Causes swelling, muscle spasm, and pain within the bladder
  - Pain causes more stress and creates a cycle of inflammation
- Individually, or in combination with calculi or mucus plug, can lead to UO

https://telaf.wordpress.com/2014/11/02/moving-house-with-your-cat
Signalment

- Most common in adult male cats
  - Obesity
  - Multi-cat household
  - Stressful experiences
  - Indoor only
- Can occur at any age
- Female cats can also obstruct
  - Cystoliths
  - Congenital defect
  - Less likely from FIC

Who? ME??
Labwork

- Dehydration
- Post Renal Azotemia
- Metabolic Acidosis
- Electrolyte Imbalances
  - Hyperphosphatemia
  - Hyperkalemia
<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
<th>Reference Interval</th>
<th>LOW</th>
<th>NORMAL</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUN</td>
<td>363 mg/dL</td>
<td>16 - 36</td>
<td></td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>CREA</td>
<td>20.4 mg/dL</td>
<td>0.8 - 2.4</td>
<td></td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>BUN/CREA</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Na</td>
<td>150 mmol/L</td>
<td>150 - 165</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>8.3 mmol/L</td>
<td>3.5 - 5.8</td>
<td></td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>Na/K</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl</td>
<td>111 mmol/L</td>
<td>112 - 129</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
</tbody>
</table>

Catalyst Dx (March 4, 2017 1:50 PM)

CREA, BUN: Test results for the latest analyzer run have been multiplied by the dilution factor for a dilution of 1 in 10 total.
Urinalysis

Appearance

Specific Gravity


http://cdn.shopify.com/s/files/1/0318/5229/products/71RVr3dcqDL._SL1500_5edd2c30-2db4-4a74-97f0-29acdf77b919_1024x1024.jpg?v=1486014734
# Urinalysis

- **pH**
  - Struvite formation at high pH

- **Protein**
  - Possible renal damage

- **Use supernatant if needed**

![Urinalysis Test and Reading Time Chart](http://localprivate.info/urinalysis/)
Urinalysis

Sediment

Red Blood Cells

White Blood Cells

Crystals

Bacteria?

Casts

http://www.eclinpath.com/ngg_tag/urine-crystals/nggallery/page/3
Urinalysis

Dry Mount Cytology

https://ahdc.vet.cornell.edu/sects/clinpath/test/cytol/collection.cfm
Presenting Complaints

- Constipation
- Straining to Urinate
- Inappropriate Urination
- Vocalizing
- Behavior Changes/Hiding
- Vomiting
- Ataxia/Hind Limb Weakness
Hospital Triage

- Evaluate as soon as possible
- Palpate bladder
- Obtain Vital signs

https://www.youtube.com/watch?v=YWrQJgUX_YM
Bladder Palpation
Bladder Palpation
Vital Signs

1. Heart Rate
2. Mentation
3. Weight
4. Respiratory Rate
5. Mucous membranes/CRT
6. Temperature
Recognizing the Critical Patient

Hypovolemic and Cardiogenic Shock due to dehydration and hyperkalemia

- Bradycardia
  - $< 160$ BPM
- Hypotension
  - MAP $< 90$
- Hypothermia
- Inappropriate Mentation
  - Dull to Comatose
Hyperkalemia

Build-up of potassium occurs when it cannot leave the body through urine.

Increased extracellular potassium disrupts the Na\(^+\)/K\(^+\) pump causing muscle weakness and cardiac arrhythmias.
Initial Stabilization

1. Establish venous access
2. Treat hyperkalemia
3. Unblock as soon as possible
4. Perform decompressive cystocentesis if unable to unblock
1. Establish Venous Access
2. Treating Hyperkalemia

Intravenous Fluids

Dextrose/Insulin

Dextrose 0.5-1 gm/kg IV

Regular Insulin 0.5-1.1 U/kg IV

Calcium Gluconate

50-100 mg/kg IV over 10-20 minutes
Resolving Hyperkalemia
3. Urinary Catheterization

Analgesia and Anesthesia

- Buprenorphine 0.015-0.03 mg/kg
- Midazolam 0.1-0.2 mg/kg
- Dexdomitor/Ketamine/Buprenorphine
  - for fractious cats
- Titrated propofol for anesthesia 4-6 mg/kg
- Isoflurane can also be used for anesthesia maintenance
- Coccygeal epidural for local anesthesia

https://www.atdove.org/video/coccygeal-block
3. Urinary Catheterization

Catheter Types and Sizes

- Tom Cat
- Red rubber
- Slippery Sam
- Size Does Matter: 3.5 vs. 5 Fr
3. Urinary Catheterization
4. Decompressive Cystocentesis

http://todaysveterinarytechnician.com/articles/urethral-obstruction-in-male-cats/
4. Decompressive Cystocentesis

- 15 cats were studied
  - 11 successful
  - 4 were considered failed
    - 3 developed uroabdomen
    - 1 developed hemoabdomen
  - None had bladder rupture

The “successful” cats had decompressive cystocentesis an average of 3 times

The “failed” cats had cystocentesis an average of 7 times

Cystocentesis was performed over the course of 36 to 96 hours of hospitalization
Hospitalization and Nursing Care

"It's curiosity."

http://themetapicture.com/a-catastrophic-diagnosis/
Acute Kidney Injury

Obstruction causes backflow of urine to the kidneys, which causes inflammation of the glomeruli.

- Post-Obstructive Diuresis
- Possible to develop chronic kidney disease
- Monitor “ins” vs “outs”
- Watch for fluid overload
Medications

- Analgesics
  - Buprenorphine 0.015 mg/kg

- Antispasmodics
  - Prazosin 0.5-1 mg per cat per day
  - Acepromazine

- Others
  - Amitriptyline
  - Cerenia

- Antibiotics
  - Positive Urine Culture
  - Will not prevent infection from catheter

- Steroids
  - Associated with increased rate of pyelonephritis
  - No improvement of inflammation
Continuous ECG Monitoring

Monitor heart rate and rhythm until hyperkalemia is resolved

https://www.aedbrands.com/defibrillator/cardiac-science/accessories/g3-pro-3-lead-ecg-kit.html

Urinary Catheter Care

- Clean with dilute chlorhex and saline q4-6h
- Untangle kinks
- Tape to tail to prevent pulling on the prepuce
- Hard E-Collar at all times
IV Catheter Care

- Place an aseptic IV
  - Clipped around entire limb
  - Aseptic prep
  - Band-Aid over insertion site
- Place “cat wrap” to help prevent swelling
- Monitoring for swelling and phlebitis
Minimize Stress in Hospital

- Create a safe environment for the cat
- Practice low-stress handling
- Provide TLC
- Consider avoiding urinary diets until the cat leaves hospital
- Feliway

At Home Care

Diet

Urinary Diets can help to reduce crystalluria and FIC signs

Increase water intake

Canned food

Water fountains

http://www.drsfostersmith.com/product/prod_display.cfm?pcatid=19955
At Home Care

Litterboxes

All levels of the home

One more than number of cats

1 ½ times length of cat

Environmental Enrichment

https://indoorpet.osu.edu/cats
Questions?

jschade@eivsc.com

