

The Upper Urinary Tract – More Minimally Invasive Treatments for Common Conditions

Joao Felipe de Brito Galvao, DVM, MS, DACVIM (SAIM)

VCA Arboretum View Animal Hospital, Downers Grove, IL

Introduction

Ureteral and renal disorders in dogs and cats are often life-threatening yet increasingly treatable through minimally invasive procedures. Over the past decade, interventional techniques such as **subcutaneous ureteral bypass (SUB)**, **ureteral stenting**, **percutaneous stenting**, and **renal pelvic sclerotherapy** have significantly improved survival, quality of life, and owner satisfaction compared to traditional surgery.

This session reviews these techniques, when to consider them, and key take-away lessons for clinical practice.

Subcutaneous Ureteral Bypass (SUB)

Overview

Treatment options for ureteral obstruction include medical management, ureterotomy, ureteral stenting, and SUB placement. Surgical correction carries a high risk of stricture, leakage, and recurrence. Stent placement can be technically challenging in cats with proximal obstructions. SUB devices—developed as artificial ureters—offer excellent long-term outcomes with fewer complications.

Advantages & Long-Term Care

- Lower complication and re-obstruction rate than ureterotomy or stenting
- Allows direct kidney-to-bladder drainage
- Requires **routine flushing every 3–6 months** to maintain patency and prevent infection
- Most cats resume normal quality of life post-procedure

Complications

Leakage (<5%), kinking (<3%), infection, and obstruction (now reduced to ~12%). Dysuria may occur in bilateral cases.

Clinical Outcomes

In large case series (>130 cats), >93% survived to discharge; renal values improved by 77% on average. Long-term survival depends on pre-existing renal function, which cannot be predicted solely from ultrasound appearance.

Take-Home Message

SUB placement is the **treatment of choice** for ureteral obstruction in cats. Mild

pyelectasia does not rule out obstruction. Consider **individual kidney GFR** via nuclear scintigraphy to evaluate renal function before and after intervention.

Ureteral Stenting

Overview

Ureteral stents provide an internal conduit from kidney to bladder, bypassing the obstruction while preserving renal function. Stenting can be performed endoscopically, avoiding open surgery—particularly advantageous in dogs.

Indications

Ureteral obstruction from stones, strictures, tumors, or external compression.

Technique & Success Rates

Endoscopic placement is preferred; percutaneous or surgical approaches are reserved for complex anatomy. Success is ~90% in females and ~70% in males.

Potential Complications

- Hematuria ($\leq 20\%$)
- Dysuria ($< 2\%$)
- Re-obstruction (9%)
- Migration (6%)
- Encrustation (2%)
- Stent fracture ($< 2\%$)

Take-Home Message

Endoscopic **ureteral stenting** is the **treatment of choice for dogs** with ureteral obstruction. Choose a facility experienced with endoscopic placement to ensure faster recovery and lower morbidity.

Percutaneous Antegrade Ureteral Stenting

Overview

When endoscopic access is limited—such as with ureteral obstruction from neoplasia—**percutaneous antegrade stenting** offers an alternative. The technique combines ultrasound and fluoroscopic guidance to gain renal pelvic access and place a stent into the bladder.

Clinical Application Example

Using ultrasound, an 18G catheter accesses the renal pelvis, followed by contrast injection and guidewire passage under fluoroscopy. Once the guidewire reaches the bladder, a stent is deployed antegrade to restore urine flow.

Take-Home Message

Percutaneous stenting is a **minimally invasive palliative option** for ureteral obstruction secondary to neoplasia or distal ureteral compression, avoiding major surgery and providing rapid relief.

Idiopathic Renal Hematuria – Sclerotherapy

Overview

Idiopathic renal hematuria (IRH) causes chronic, severe, and otherwise unexplained bleeding from the kidney. It is most common in large-breed young dogs and may affect one or both kidneys (bilateral in ~20%).

Diagnosis

Cystoscopy is essential to confirm bleeding from a ureteral orifice and rule out stones, infection, or neoplasia.

Treatment Options - Nephrectomy (no longer recommended)

- **Topical sclerotherapy** with silver nitrate or povidone-iodine (minimally invasive, kidney-sparing)
- Ureteroscopic electrocautery (for refractory cases)
- Supportive therapy (e.g., Yunnan Baiyao, aminocaproic acid)

Procedure

In females, access is fully endoscopic; in males, a small perineal incision allows ureteral catheterization. A ureteral stent is left in place 2–4 weeks post-procedure.

Complications (Rare)

Pollakiuria, transient hematuria, infection, or stent migration.

Outcome

~80% achieve complete resolution; most others have significant improvement.

Take-Home Message

Never perform nephrectomy for renal hematuria. Sclerotherapy is **safe, effective, and minimally invasive**, with the potential for recurrence in the contralateral kidney (20%).

Summary Table

Condition / Technique	Species	Key Benefit	Key Limitation	Take-Home Message
SUB Placement	Cat	Best long-term patency, minimally invasive	Requires lifelong flushes	Gold standard for feline ureteral obstruction
Endoscopic Ureteral Stent	Dog	Minimally invasive, preserves kidney	Possible dysuria/UTI	First-line option for canine ureteral obstruction
Percutaneous Stent	Dog/Cat	Palliative for neoplasia	Technical challenge	Effective alternative when endoscopy impossible
Renal Sclerotherapy	Dog	Resolves idiopathic renal bleeding	May need repeat if bilateral	Kidney-sparing, curative in 80%

Key Take-Away Points

- **Ureteral obstruction** is an emergency—renal damage occurs within days to weeks.
- **SUB devices** revolutionized feline management—low recurrence, high owner satisfaction.
- **Endoscopic stenting** in dogs provides a same-day, minimally invasive solution.
- **Percutaneous approaches** offer excellent alternatives when endoscopy isn't feasible.
- **Renal sclerotherapy** should replace nephrectomy for idiopathic renal hematuria.
- **Individual kidney GFR** via scintigraphy is invaluable for pre- and post-procedure assessment.