香港獸醫專科服務

HONG KONG VETERINARY SPECIALTY SERVICES

# Ureteral Obstruction in Dogs and Cats

**Quick Take**

**Ureteral obstruction** means the **tube connecting the kidney to the bladder (the ureter) becomes blocked.**
This causes urine to back up into the kidney, leading to:

- Hydronephrosis (kidney swelling)
- Kidney damage
- Pain and vomiting
- Life-threatening electrolyte changes

**Cats** are especially prone to **ureteral obstruction** due to **tiny ureters** (1 mm or less) that easily block. The most common cause in cats = ureteroliths (stones).

**In dogs:** stones, scar tissue, tumours, or trauma may be responsible.
**SUB placement is now considered the gold-standard treatment, especially in cats, replacing risky traditional surgeries.**

## 1) What's going on inside?

The ureters carry urine from the kidney → to the bladder.

When a ureter becomes blocked, urine cannot flow normally.

**Pressure rises** inside the kidney, causing:

- Dilation of the renal pelvis (hydronephrosis)
- Compression of kidney tissue
- Reduced kidney filtration
- Loss of kidney cells
- Potential for total kidney failure

Both kidneys are vital, so losing even one to obstruction can be dangerous — especially in **older animals** or those with **pre-existing kidney disease**.

### Causes of obstruction

**Cats**

- Ureteroliths (stones) — most common
- Strictures/scar tissue
- Inflammation
- Neoplasia (rare)
- Blood clots or mucous plugs

**Dogs**

- Stones
- Tumours
- Trauma
- Surgical complications
- Scarring or congenital abnormalities

Cats are more prone because their ureters are extremely narrow and do not stretch.

**2) What owners notice**

Signs can be **vague** or **severe:**

- Vomiting
- Lethargy or hiding
- Decreased appetite
- Pain (crying, tense abdomen)
- Straining or small urine output
- Weight loss
- Dehydration
- Collapse (in severe kidney failure)

Some pets show almost no outward signs until the kidney is badly compromised.

**3) Diagnosis**

**A) Physical exam**

- Pain around the kidneys
- Dehydration
- Lethargy
- Sometimes a firm kidney can be felt

**B) Bloodwork**

- Elevated creatinine and BUN
- Electrolyte abnormalities (especially high potassium)
- Decreased red blood cell count in chronic cases

**C) Urinalysis**

- Blood
- Protein
- Crystals

**D) Imaging**

- The most important diagnostic step.
- Ultrasound — identifies obstruction, hydronephrosis, stones, strictures
- X-rays — show mineralized stones
- CT scan — used for complex or surgical planning cases

**Once obstruction is confirmed, urgent treatment is required**.

**4) Treatment overview**

There are **four main approaches:**

1. Medical management
2. Ureteral stent placement
3. SUB device placement ← Gold standard in cats
4. Traditional ureteral surgery (rarely recommended now)

**A) Medical management**

May be **attempted only** when:

- The obstruction is partial,
- Kidney values are stable,
- The cause may pass (e.g., tiny stones),
- The animal is not critical.

**Medical care** includes:

- IV fluids
- Pain management
- Anti-nausea meds
- Medications to relax the ureter
- Monitoring via repeat ultrasound

**BUT:**
**In cats, medical management succeeds in <10–20% of complete obstructions.**
**Delaying surgery risks permanent kidney damage.**
**Most cats and many dogs need interventional or surgical correction**.

**B) Ureteral stent placement**

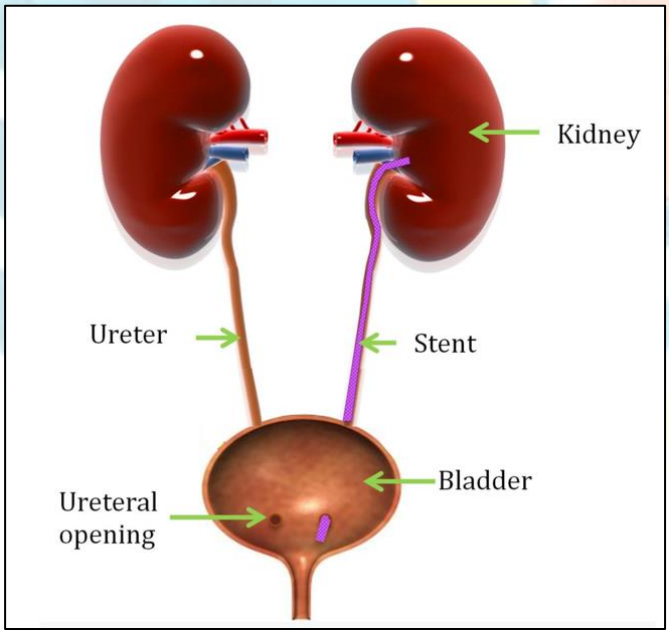
A **stent** is a **small tube placed inside the ureter to allow urine flow**.

**Pros:** less invasive

**Cons:**

- Stents can cause **bladder irritation, chronic UTIs, stone formation**
- Stents may not fit in tiny feline ureters
- High failure or complication rate in cats
- **Cats do poorly** with stents compared to dogs.

This is why **SUB systems have become preferred**.




One end of the ureteral stent is secured in the renal pelvis and the other is secured at the ureteric opening

**C) SUB System (Subcutaneous Ureteral Bypass)**

**Gold-standard treatment in cats**, and widely used in dogs
SUB has revolutionised treatment of ureteral obstruction.

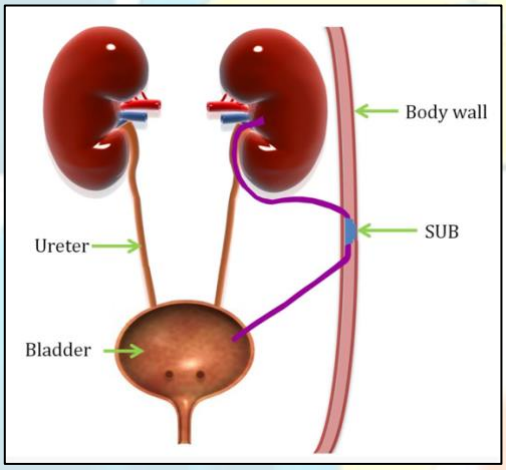
**5) What is a SUB device?**

A **SUB creates a new pathway for urine** to leave the kidney, bypassing the obstructed ureter entirely.

The system has:

- A **nephrostomy catheter** inserted into the kidney
- A **cystostomy catheter** inserted into the bladder
- A **subcutaneous port** placed **under the skin**
- A specialized locking system and valves

**Urine flows:**
Kidney → SUB tube → Bladder
completely bypassing the blocked ureter.




For SUB placement, a pigtail catheter is inserted into the renal pelvis and connected to a subcutaneous access port. A second catheter is also

**6) Why SUB is preferred (especially in cats)**

- Works even when the ureter is severely damaged
  Stones, strictures, scarring → SUB bypasses all of it.

- Very high success rate
  **Success rates in cats: 85–95%**
  **Dogs: similar or slightly lower** depending on cause

- **Safer than old surgical techniques**
  Traditional surgeries (ureterotomy, ureteral reimplantation) have:
  - High complication rates
  - Risk of leakage or stricture
  - Difficulty in tiny feline ureters

- Allows **FLUSHING**

  The SUB port allows vets to flush the system periodically, preventing:

  - Mineral build-up
  - Infection
  - Blockage
  - Catheter occlusion
  - Good long-term kidney preservation

- Many cats with pre-existing chronic kidney disease extend life significantly with SUB placement.
- Immediate relief: urine drains immediately, lowering kidney pressure and restoring filtration.
- Good for both unilateral and bilateral obstruction
- Suitable even in older or fragile patients

**7) SUB placement: What happens?**

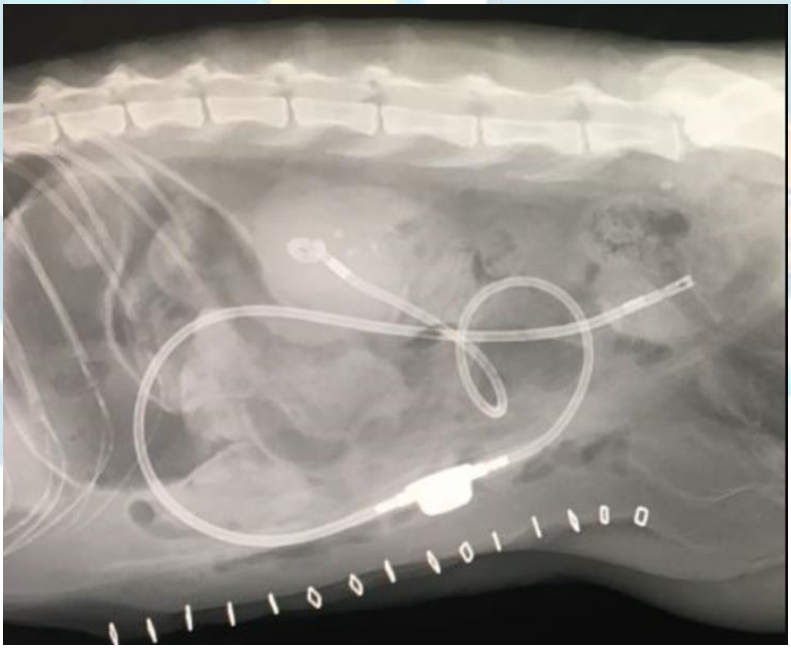
The procedure is performed by **a specialist surgeon or interventional radiologist**.

**Steps**

1. Pet is anesthetized and stabilized beforehand.
2. A small surgical approach is made to the kidney and bladder.
3. Catheters are inserted into renal pelvis and bladder.
4. Ends of the tubes are tunneled to a port placed under the skin.
5. System is flushed and confirmed patent via ultrasound.
6. The obstructed ureter is left in place (not removed).

**Surgery time**
~1 hour.

**Hospital stay:** 2–4 days depending on kidney function and hydration status.



**8) Complications and realistic rates**

Overall, SUB placement is much safer than traditional ureteral surgery.

**Early complications**

| Complications | Rate | Notes |
|---|---|---|
| Haematuria (blood in urine) | Common (20–40%) | Usually temporary |
| Infection | 10–20% | Managed with antibiotics |
| SUB blockage/kinking | ~5–10% | May require flushing or revision |
| Leakage | <5% | Rare with experienced surgeons |
| Acute kidney injury | 10–30% | Usually improves with treatment |
| Death peri-operatively | ~5–10% | Depends on how ill the pet was initially |

**Kidney status at presentation strongly affects outcome**.

**Long-term complications**

| Complication | Rate | Notes |
|---|---|---|
| Mineral build-up on SUB catheter | 15–25% | Prevented by routine flushing |
| Infection (recurrent UTI) | 10–20% | Cats with CKD more prone |
| Device obstruction | 10–15% | May need revision |

Sedation might be needed for flushing every 3–4 months- although in more chilled feline patients, **Gabapentin the morning prior to flush might avoid the sedation**.

A SUB patient well managed by the owners can live for years with its device.
**Poor management will inevitably lead to blockage (encrustation) within a few months**.

**Long-term success**
70–90% of cats live months–years with a functional SUB system, many with excellent quality of life.

**9) Recovery and aftercare**

**First 2 weeks**

- Confine to a small room
- Prevent jumping
- Give prescribed medications
- Monitor appetite, urine output, hydration. A few patients will need a temporary feeding tube.
- Follow-up with ultrasound within 1–2 weeks

- Check the wound: any excessive swelling, redness around the subcutaneous port, would be suggestive of infection or urine leakage and would require urgent attention.

**Ongoing**

- SUB port flush **every 3–6 months** at your vet
- Regular blood tests to monitor kidney values
- Adequate hydration (wet food encouraged)
- Manage chronic kidney disease if present

**Quality of life**

Most pets return to:

- Eating normally
- Active, happy behaviour
- Comfortable urination
- Normal life with minimal restrictions

**10) Prognosis**

| Condition at Diagnosis | Prognosis after SUB |
|---|---|
| Early obstruction, stable kidney values | Excellent |
| Moderate kidney injury | Good |
| Severe kidney failure at presentation | Guarded |
| Bilateral obstruction | Fair–Good if treated promptly |
| Chronic obstruction with kidney atrophy | Guarded |

The SUB often **adds months to years of good-quality life**.
Cats especially tolerate SUB systems extremely well long-term.

**11) Selected Veterinary References**


- ACVS – Ureteral Obstruction in Dogs and Cats
- VCA Hospitals – Ureteral Obstruction & SUB Device
- Berent AC, Weisse C., J Feline Medicine and Surgery – Long-term outcomes for SUB systems in cats
- Kyles et al., Veterinary Surgery – Ureteral obstruction and surgical options
- Acierno & Labato, J Small Anim Pract – Management of feline ureteral obstruction
- Weisse & Berent, Clin Tech Small Anim Pract – SUB system technique and outcomes


**Bottom Line**

- Ureteral obstruction is life-threatening and requires urgent treatment.
- SUB (Subcutaneous Ureteral Bypass) is now the treatment of choice in most cats and many dogs because it is safer, more reliable, and better tolerated than traditional surgery or stents.
- It immediately relieves kidney pressure, preserves renal function, and offers excellent long-term quality of life when combined with regular SUB flushes and kidney monitoring.
- Many cats and dogs go on to live happy, comfortable lives for months to years after SUB placement.