



Bladder tumours in dogs and cats

(focus on transitional cell carcinoma / urothelial carcinoma, the most common type)

1. What these tumours are?

The vast majority of canine bladder tumours are transitional cell carcinoma (TCC), now often called urothelial carcinoma (UC). This cancer arises from the lining of the bladder.

In cats, bladder tumours are rarer, but when they occur, they are usually TCC as well.

TCC most often occurs at the trigone (the bladder neck area where the ureters enter and urethra exits). Unfortunately, this location makes complete surgical removal extremely difficult in most dogs and more aggressive, life-changing surgeries might be considered.

2. How common?

- Dogs: uncommon, but most common malignant bladder tumour in dogs. More common in terrier breeds (Scottish Terrier highest risk; also Westie, Sheltie, Beagle). Female dogs slightly over-represented.
- Cats: rare overall; most tumours are TCC or lymphoma. Cats often present later in disease course.

3. Typical signs owners notice

- Straining to urinate
- Increased frequency of urination
- Bloody urine
- "Urinary tract infection that keeps coming back"
- Occasional urinary incontinence
- In advanced cases: difficulty urinating or blockage

These symptoms are indistinguishable from UTI alone, which is why imaging/biopsy is needed for diagnosis.

4. Pathophysiology in simple terms

- Tumour begins in the urothelium (bladder lining). Invasion is progressive and often extends into the bladder wall, trigone, urethra, and sometimes prostate in male dogs.
- Spread (metastasis) commonly goes to regional lymph nodes, then lungs, liver, and bone later in the disease.
- DNA "driver" changes such as BRAF mutation (dogs) are found in many cases; this mutation is useful diagnostically (BRAF urine test) and supports the tumour's origin.

5. Diagnosis and staging

- Ultrasound: looks at mass and invasion pattern
- Urine cytology / BRAF test: non-invasive support for diagnosis
- Cystoscopy / biopsy: confirms the diagnosis
- Chest imaging ± lymph node assessment: checks for spread
- Traumatic catheterization should be considered if cystoscopy is not an option



- **!!! Fine-needle aspiration should be avoided as it facilitates the seeding of the tumour cells across the abdominal wall !!!**

6. Treatment overview

- **Dogs**

- **Surgery:** Curative only in rare cases when the tumour is NOT in the trigone (~10–20% of cases). Partial cystectomy is possible for tumours on the bladder apex.
- **Medical management:** NSAIDs (piroxicam) alone or with chemotherapy (mitoxantrone, vinblastine, gemcitabine) to control tumour growth and prolong life. Control is limited in a majority of patients. Discomfort and urethral obstruction are not addressed and can lead to euthanasia. **Piroxicam + chemotherapy** is still first-line; trials evaluating TKIs are ongoing.
- **Urethral stenting:** palliative in obstruction cases — improve comfort and ability to urinate, yet may cause urinary incontinence if it was not already present prior to stenting. Does not fully control the straining
- **Radical cystectomy with apposition of the ureters** to the skin, the prepuce (males) or the vagina is reported to control all pain due to the tumour and only option to provide a complete excision of all the tumour. Will cause urinary incontinence. Patients require minimal yet regular nursing in order to avoid the irritation due to urine scalding.

- **Cats**

Many treatment recommendations mirror dogs, but surgery is sometimes more feasible in cats if the tumour is not in the trigone.

Cats can occasionally achieve good local control with partial cystectomy.

Metastasis rates appear lower in cats than dogs, but local recurrence is still common.

7. Surgical emphasis: when is it appropriate?

When **partial cystectomy** is feasible?

- 1 Dogs: only when tumour is located in apical/bladder body away from trigone (~10–20% of cases). Median survival can exceed 1 year when tumour is completely resectable.
- 2 Cats: feasible more often if discovered early and not in trigone. Some cats achieve many months to >1 year with surgery ± adjuvant treatment.

When the tumour is in the trigone, complete excision is generally impossible, and debulking surgery does not improve survival.

Radical cystectomy with reapposition of the ureters provides the best control of the pain and signs of obstruction, yet will cause permanent and definitive urinary incontinence. Incontinence is however often already present in most patients with significant invasion of the trigone/urethra

Alternatively In these cases, **medical management ± stent** can be considered. Stents can be applied in a minimally invasive procedure, yet neither medical management nor the stenting will address the pain, or remove the tumour, allowing ongoing metastatic spread.

8. Complications of bladder surgery (partial cystectomy)

- Temporary post-op urinary frequency/ urgency: common (~30–50%)
- Urine leakage from incision: uncommon (~5–10%)
- Infection: mild–moderate (~10–20%)



- Inability to fully control margins / recurrence: high if trigone involved (most dogs not surgical candidates)
- Cats undergoing partial cystectomy generally handle the procedure better than dogs when margins are achievable.
- Stranguria and pain remain present in a majority of cases

9. Survival expectations (realistic)

a) Non-trigone tumour, complete surgical removal

Dogs: ~12–18+ months median; some >2 years

Cats: many months to >1 year, sometimes longer

b) Trigonal located tumour (non-resectable), on NSAID + chemotherapy

Dogs: median ~6–12 months

Cats: range variable, often months, better if early

c) with stent for obstruction

Palliation improves comfort; survival depends on underlying tumour behaviour

Can improve quality of life but not curative.

d) Following radical cystectomy: survival depends on presence/absence of metastatic spread at the time of surgery. Minimal morbidity as long as owners are happy to keep a

10. Non-surgical therapy (dogs & cats)

- NSAID only (piroxicam): anti-tumour effect via COX-2 pathway > Some dogs stabilize for months
- Chemo + NSAID: best-documented survival advantage, Mitoxantrone, vinblastine commonly used
- Urethral stent: opens obstructed urethra to allow urination. Palliative but good QoL improvement
- Radiation: emerging role; not first-line. Used when surgery not possible. Has been reported after radical cystectomy, for better control of the metastatic disease to the locoregional lymph nodes.

11. Quality-of-life management

- Pain control
- Preventing or managing urethral obstruction
- Controlling secondary UTIs
- Monitoring urination comfort
- Maintaining appetite and hydration
- Many dogs and cats feel well for much of the disease course when medical management and palliative care are applied early.



Selected English-language veterinary references

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