Bladder and urethral neoplasia: What's new?

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Introduction
In dogs, the most common site for neoplasia in the urinary tract is the bladder although it comprises less 1% of all canine tumours.

Aged female animals (mean 10 years) are usually affected with the exception of embryonal rhabdomyosarcoma that occurs mainly in young dogs and particularly those of large breeds.

Bladder cancer is much rarer in the cat than in the dog, accounting for less than 0.5% of all tumours.

The majority of tumours in both the dog (97% of cases) and cat (80% of cases) are epithelial, the most common being transitional cell carcinoma and they may be solitary or multiple and can appear as papillary or non-papillary mass, with an infiltrating or non-infiltrating growth.

Tumours most commonly arise at the trigonal region of the bladder.

Transitional cell carcinoma is usually locally invasive and, infiltrating through the bladder wall, it can extend into adjacent tissues and regional organs such as the pelvic fat, prostate or uterus, vagina or rectum. Peritoneal seeding may also occur as well as metastatic spread to internal iliac and lumbar lymph nodes, lungs, liver, spleen and pelvic bones. Nearly 50% of the cases had regional lymph node involvement at time of diagnosis.

Mesenchymal bladder tumours are mainly derived from fibrous tissue or smooth muscle and these include leiomyoma, haemangiomia and fibroma along with their malignant counterparts. Rhabdomyosarcoma (botryoid or embryonal sarcoma) is a rare embryonal myoblast tumour which sometimes occurs in the bladder wall. It usually arises in the trigonal region, is often multi-lobulated and may occlude the ureteric orifices. While most mesenchymal bladder tumours are locally invasive and less likely to metastasise than transitional cell carcinoma, however, embryonal rhabdomyosarcoma has a tendency for both local recurrence after surgery and distant metastasis. Lymphoma has also been reported.

Clinical signs and diagnosis
Dogs with bladder tumours are often presented with signs similar to those of chronic cystitis including haematuria, dysuria and pollakiuria. Urinalysis may help to distinguish between cystitis and neoplasia if pleomorphic tumour cells are seen on cytological examination but it is diagnostic in less than 50% of the cases.

Contrast radiography may indicate the presence of a bladder mass but ultrasonography of the bladder is often more useful to visualise a mass or a localised, irregular, bladder thickening and also gives information on the depth of invasion of the bladder wall.

CT scanning is invaluable in detecting lumbar lymph node enlargement and chest metastasis. Biopsy may be performed using cystoscopy, or by applying negative pressure with a syringe to a catheter inserted into the bladder so sick in some tissue. Ultrasound-guided fine needle aspiration is easily performed for large bladder masses but carries the risk of seeding tumour cells along the tract of the needle and therefore it is usually not recommended.

Surgical therapy
Traditionally, surgery has had a limited role in the treatment of canine and feline bladder tumours. In fact due to their invasiveness and capacity infiltrating the musculature, the use of a cystoscopic superficial resection followed by a topical therapy is not feasible in our animals, while it is the treatment of choice in humans with non invasive urinary cancer.

In human medicine, invasive bladder tumors are treated by means of a complete cystectomy followed by the reconstruction of the lower urinary tract with an ileal neobladder.

In dogs and cats, even if technically feasible, this method is limited by the necessity of mechanically “squeezing” the bladder.

Despite this, a number of techniques have been developed with the aim of removing the bladder and obtaining a functional lower urinary tract.

Partial cystectomy
Partial cystectomy is indicated for tumors located in the bladder apex, lateral wall or small based.

For apical neoplasia, a non crushing forceps is applied on the body, the apex is resected and bladder wall is sutured over the balloon of a Foley catheter that is maintained for 4-6 days. For lateral or ventral wall tumors, the bladders is simply cut out and sutured. In male dogs may be necessary to resect also a part of the prostate.
If needed the ureter must be cut and reimplanted in a different site.

Care must be paid in not occluding or ligating both of the caudal vesical arteries.

Initially dogs need to urinate frequently but complete continence is regained in 4-6 weeks.

**Internal cystectomy**

This technique is especially important for benign or low grade malignant tumors and rhabdomyosarcoma. The bladder is incised along its major axis and opened. The wall is cut partial thickness around the base of the neoplasia taking care to not damage important vessels on the serosal side and sutured.

**Trigonial cystectomy**

This technique is based on the paper of Saulnier Troff and co-workers. Briefly, a complete circumferential resection of the trigonal area is performed paying attention to preserve the braches of the caudal vesical artery nourishing the apex by means of a serosal stripping. Than, an end to end anastomosis between the remaining part of the bladder and the urethra is performed and the two ureters are reimplanted.

There are only two cases reported but they both regained continence after a transient pollakiuria.

**Radical (prostato)cystectomy and colonic reimplantation**

With this technique the colon acts as a reservoir for urines. Bladder, and prostate if necessary, are removed and an end to side anastomosis between ureters and colon is performed.

Many complications are reported including urinary tract infection, colitis and metabolic disturbances. For these reasons, this type of surgery is no longer used.

**Radical (Prostato)cystourethrectomy and urethrobiureteral/ colobipureteral anastomosis**

This technique is indicated for dogs that are not amenable to a conservative cystectomy, preferably of small size and of good nature as they must wear a diaper for the rest of their life.

Bladder, and prostate if neccessary, is removed and an end to end anastomosis is performed between the two ureters and the remaining urethra.

In female dogs, anastomosis is realized with the uterine stump.

In male dogs, removing bladder and prostate can leave a too short urethra to accomplish a tension free suture.

In these cases, a segment of small bowel is interposed between the urethra and the ureters.

Two ureteral catheters are positioned and removed after 6-8 days.

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**Cysto-colpo anastomosis**

This approach is indicated in female dogs with urethral tumors and a free bladder. The urethra is resected in proximity of the vagina (a pubic osteotomy can be necessary), the vagina is sutured and a end to end anastomosis is done between the bladder neck and the uterus.

A Foley catheter is left in place for 6-8 days.

**Conclusions**

Many possibilities exist to excise bladder, prostate and urethra but no large series of cases are reported and available data are too limited in order to assess on the results in terms of efficacy and survival.

Our experience with complete cystectomy is good in terms of clinical results and owner acceptance but most of the patients die because of metastasis.

Unfortunately, the role of adjuvant chemotherapy in these cases is still unknown.

**References**