

MANAGEMENT OF URINARY BLADDER SURGERY IN DOGS

S. Thilagar

Professor and Head, Department of Veterinary Surgery and Radiology, Madras Veterinary College-TANUVAS, Chennai 600007

Surgical management of urinary bladder in dogs requires a refreshment for the practitioners since the condition involving the urinary bladder is increasing in the recent years. Many surgical lesions like Cystic calculi, Bladder rupture, Neoplasm of urinary bladder, blood clot and Congenital condition involving abnormal location of tubular structure warrants surgery in the bladder. Advances in the field of Veterinary Surgery needs a revisit in the procedures and general approach. The paper describes different surgical procedures and its advances.

a. Cystotomy:

Indication Calculi removal, space occupying pathological lesion, blood clot congenital condition partially involving bladder and tissue harvest for biopsy.

A surgical procedure incising the bladder either on the dorsal or ventral surface. In some occasion ventral approach is preferred to attain easy exposure of ureter and catheterization Midline ventral approach after aseptic preparation is the common approach employed in dogs. The urinary bladder is isolated and packed with sterile sponges Prior to surgery urine is removed from the bladder using 23 G needle with sterile syringe in-order to prevent abdominal contamination. The bladder is temporarily immobilized by applying of two stay suture (cranial and caudal) including serosa to submucosa in the apex and neck. The bladder should be incised using blade 15 and the incision is extended using Metzenbaum scissors .Use of Allis tissue forceps, Crushing thumb forceps are to be avoided. Use of non-crushing thumb forceps will be beneficial in removing the calculi without causing damage to the mucous

membrane. Incision close to urteral opening should be avoided in order avoid occlusion of ureter. Although inversion suture is recommended, some time it is impossible to avoid penetration of bladder lumen in thin walled bladder. Bleeding form the incised is best controlled by thumb pressure but by not by either using cryosurgery or hemostatic forceps. The bladder should be lavaged using normal saline which aids in cent percent removal of left out minor calculi, debris, dead cells and casts, In chronic inflammation mucosal fold and neck of the bladder should be examined carefully for minor calculi .In many circumstances this pose problems. Surgeons should count the removed calculi and tally with imaging results to achieve 100 % success, Failure to remove all cystic calculi, catheterization and flushing, it will aid in recovery rate.

Although many literatures pronounce double layer inversion suture for Cystotomy closure, single layer apposition closure is recommended for most cystotomies of thick walled bladder. Thin wall bladders may be closed with an appositional or inverting pattern (Radasch *et al.*, 1988). The author has observed many referred cases of bladder leakage after thickened bladder wall that was suture with inverting suture pattern. Catheterization (closed system) prior to surgery is a preferred method. Antigrade and retrograde catheterization and flushing the urethra is an essential in Cystotomy surgery.

The use of monofilament absorbable suture materials is recommended to minimize the incidence of such complication. The preferred suture and needle options are furnished in the table.

Table: Choice of suture materials and needles

Structure	I-choice	II-choice	Cat & Small dog	Medium dog 20-45 kg	Large & Giant	Needle type
Urinary	Monocryl					

Bladder	(Policlecaprone)	PDS II	4-0	4-0 3-0	3-02-0	TP
Linealaba	Monocryl (young animals)	Vicryl Plus	3-0	3-0	2-00	TP
	PDS II (old animals)			2-0 0	1-0 0	RC
S/C	Monocryl	PDS II	4-0	4-0	3-0	TP
	Vicryl Plus (antibacterial)	Vicryl		3-0	2-0	
Skin	Prolene,	silk	4-0	4-0	3-0	RC
	Ethilon			3-0	2-0	

TC-Taper Point RC -Reverse cut

The major risks bladder surgery is those of bleeding (hemorrhage), postoperative infection, urine leakage, and wound breakdown (dehiscence) over the incision. Overall complication rate is low, but serious complications can result in death or the need for additional surgery.

b. Tube Cystotomy: (Providing temporary urinary diversion)

Indications urethral rupture repair, or temporary urethral obstruction

A location in the ventro-lateral bladder wall is identified mid-way between the trigone and the apex of the bladder after mid ventral celiotomy. A purse-string suture of 2-0 or 3-0 polydioxanone is placed. A catheter is placed through a stab incision in the body wall approximately 2cm lateral to the ventral midline at a level that will minimally distort bladder position before the catheter tip is placed into the bladder. The catheter is then inserted into the bladder lumen through a stab incision in the centre of the purse-string suture. The balloon of the Foley catheter is then inflated but kept away from the bladder wall to avoid inadvertent catheter balloon puncture. Once the catheter tip is inside the bladder, the other end of the cathet -er should be occluded using artery forceps or similar. Four cystopexy sutures of polydioxanone are preplac -ed in a box configuration around the abdominal and bladder wall incisions. Ideally, the pexy sutures should pass through the seromuscular layers of the bladder wall and partial thickness through the body wall. The sutures are then tied and the catheter tip is drawn up to the bladder wall. The tube is secured with either a Chinese finger trap suture or tape tabs sutured to the skin.

Abdominal closure is routine. The catheter is attached to a closed collection system initially.

c. Cystectomy Removal of a portion of devitalized urinary bladder, bladder wall with infiltrating lesion:

Indication: Polyps, Neoplasm and Rupture bladder wall.

Transitional Cell carcinoma most commonly occurs in the urinary bladder specifically the trigone at single or multiple simultaneous sites with in the bladder. Other Primary lower urinary tract neoplasm includes squamous cell carcinoma, adenocarcinoma, hemangiosarcoma, leiomyosarcoma, lymphoma, rhabdomyosarcoma. Surgery is treatment method for all tumors located at the apex in the non-metastatic patients In animals 80% of the bladder can be safely resected without affecting long term bladder capacity, but most surgical treatment is limited to debulking procedures. When thinking about surgery the entire mucosal surface should be examined.

There is limited efficacy for TCC located at trigone. TCC is usually red and friable. In cases of neoplasm, attempt to resection is done by isolating the site form the rest of the abdomen via laparotomy pad since the risk of transplantaion of the tumor cells in certain neoplasm is a common one. Besides laparotomy usage of new instruments for closure and through flushing the bladder site surgery with saline after closure.

In cases of bladder wall rupture with gangrene status, polyps the affected area is resected and reconstructed. The viability of the wall is assessed for bleeding points.

d. Diversion surgical techniques: (Ileo-Vesicostomy. Anastomosing ileum to the bladder)

Indication Neurogenic bladder, lower urinary tract disorder, urethrocutaneous fistula, lower urinary tract obstruction.

This allows the bladder to act as continent reservoir which was drained

volitionally through the ileal conduit instead of urethra. (Smith and Hinmann, 1955). Many authors suggested that in patients with severe lower urinary tract symptoms and inability to have frequent catheterization and refractory medical therapy ileovesicostomy is the procedure of choice (Brit Zimerman and Santuci 2009).

e. Neo-cystostomy: Reestablishing abnormally located the urinary tract by fixing in its original position

Indication Ectopic ureter

In breeds like Golden Retriever, abnormal location of, submucosal location of ureter will result in ectopic ureter. In these cases, the ureter terminal location and the placement should be established after Cystostomy. The transected ureter can be fixed to the normal anatomical location using 5-0 or

6-0 suture materials. The mucosa of ureter has to sutured with mucosal of urinary bladder.

f. Augmenting Bladder wall

In cases of infiltrating lesion, insufficient bladder wall capacity can be augmented using submucosa of intestine. This technique is employed to augment bladder regeneration.

Reference

- Brit Zimm man and Santuci,R.A (2009) Ileovesicostostomy Update: changes for the 21 st Century Advances urology, 1-7 <http://www.ethicon novartis/us> accessed on 2.1.10
- Radasch,R.M., MerkeY, D.F., Niyo,Y., Wilson, J.W.R.D. (1988) An evaluation of appositional versus an inverting suture pattern for cystostomy closure.
- Smith, G.I.and Hinmann Jr,F.(1955) The intussuscepted ileal cystostomy *J.Urology* Vol **73**: 261-260
- Flower, D Surgery of the urinary tract Waltham Manual.

