

Urethral surgery

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Male Cats

- Long internal urethral sphincter



Female Cats

- Relative length comparable to that of female dogs, lumen is smaller.



Male Dogs

- Long urethra
- Diameter varies widely
- Os penis



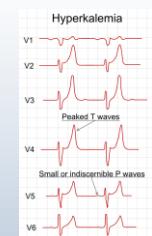
Female Dogs

- Shorter and wider than male dogs
- Less muscle tissue than male dogs
- More collagen in spayed dogs versus intact dogs



Assessment

- Stranguria
- Dysuria
- Pollakiuria
- Hematuria
- Complete obstruction



Reasons For Surgery



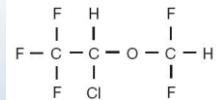
- Obstruction
 - Stones
 - Mucus plugs
 - Neoplasia
 - Granuloma
 - Strictures
 - Herniation
 - Prostatic disease
- Trauma/rupture



Urethral Obstruction



- Urinary catheter
 - Inhalant gas
- Cystostomy tube
- Pigtail catheter
- Antegrade passing of weasel wire
- Intermittent cystocentesis



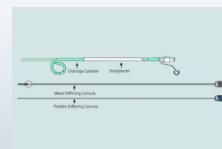
Urethral Obstruction



Minimally Invasive Inguinal Approach for Tube Cystostomy

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Urethral Obstruction



Diagnostic Imaging



- Radiographs
- Positive-contrast retrograde urethrocystography
- Ultrasound
- Urethroscopy



Radiographs



Surgical Principles



- Urethra mucosa regenerates in 7 days
- Markedly edematous with prolonged surgery and manipulation
- Consider using magnification
- Careful with catheter placement in cats

Partial Defects



- Conservative management
- Large defects will heal as long a strip of mucosa exists
- Urinary diversion
 - Urinary catheter

Complete Transection



- Requires surgical intervention
- Pass urinary catheter
 - Urinary bladder
- Debride traumatized edges
- Minimize tension
 - Tension leads to stricture
- Accurate apposition of urethral mucosa
 - Minimize scar formation

Urinary Catheter



- Should one be placed afterwards?
- Urine → inflammation
- Catheter → inflammation
- Transurethral or cystostomy tube



Urinary Catheter



- If placed:
 - Maintain until epithelization is complete
 - As soon as 7 days in defects with some mucosa present



Suture Material



- PDS
- Monocryl
- Biosyn
- Maxon
- 4-0 to 5-0
- Taper needle



Urethral Prolapse



- Young brachycephalic male dogs
- Bleeding "from prepuce or tip of penis"



Urethral Prolapse



- Urethral resection and anastomosis
- Urethropexy



Urethral Prolapse



Urethral Prolapse



- Urethropexy done by inserting instrument or firm catheter into urethra and when placing 4 sutures through penis, exiting the urethra and then back again through the mucosa.

J.A. Kirsch, J.G. Hauptman, and R. Walshaw (2002) A Urethropexy Technique for Surgical Treatment of Urethral Prolapse in the Male Dog. Journal of the American Animal Hospital Association: July/August 2002, Vol. 38, No. 4, pp. 381-384.

Urethrotomy



- Temporary opening of urethra
- Removal of stones or biopsy
- Prescrotal is preferred
 - Urethra superficial
 - Limited cavernous tissue
- Perineal or pubic can be done
 - Must close with suture



Prescrotal Urethrotomy



- Place urinary catheter if possible
- 1-2 cm incision caudal to os penis but cranial to scrotum
- SC dissection
- Retract retractor penile muscles laterally
- Longitudinal incision over catheter or stones



PrescrotalUrethrotomy



- Remove stones and pass urinary catheter into bladder
- Cystotomy if needed
- Will bleed!!
 - Corpus spongiosum that surrounds the urethra
 - Direct pressure
- To suture or not to suture...that is the question
 - More hemorrhage if not sutured
 - Stricture rare
- If not sutured, apply petroleum-based jelly on skin around urethrostomy site to prevent urine scalding and scrotal dermatitis

Urethrostomy



- Male dogs
 - Prescrotal
 - ***Scrotal***
 - Perineal
 - prepubic
- Female dogs
 - Prepubic
- Male cats
 - Perineal
 - Prepubic
- Female cats
 - Prepubic

PerinealUrethrostomy



PerinealUrethrostomy



- Elliptical incision around scrotum and prepuce
- Penis freed ventrally using sharp and blunt dissection
- Minimize dissection dorsally due to innervation of the urethra
- Release the ischiocavernosus muscles from their attachments
- Remove the retractor penis muscle from dorsal aspect of urethra

PerinealUrethrostomy



PerinealUrethrostomy



- Dissection continues cranially until paired bulbourethral glands are identified
- You are done if the urethra and bulbourethral glands can lie at the level of the skin without retracting back into the pelvic canal
- Urethra opened dorsally to the level of bulbourethral glands

Perineal Urethrostomy



- Opening should be 4-5 mm
 - enough for a mosquito forceps to fit to the hinge
 - 5-8 Fr catheter to pass easily
- I personally place 1 suture through each bulbourethral and then through the SC tissue first
- Place 3 most dorsal sutures first, interrupted pattern
- Remainder sutured with either interrupted or continuous pattern

Agrodnia MD et al. A simple continuous pattern using absorbable suture for perineal urethrostomy in the cat: 18 cases. JAAHA 2004 Nov-Dec; 40(6):479-483

Perineal Urethrostomy



Perineal Urethrostomy



- Must have excellent mucosa to skin apposition
- No tension
- Suture urethra 1-1.5 cm from the dorsal extent of incision
- E-collar at all times
- Do not touch the surgical site post operatively as long as the cat can urinate!

Perineal Urethrostomy



- Dorsal recumbency if cystotomy is needed
 - Legs pulled forward
- Dissection and exposure is the same
- Important to accurately identify the dorsal surface of urethra



Komplikationer



- Tidigkomplikationer 25% avkatt
 - Bildning
 - Svullnad
 - SC urinläckage
- Senarekomplikationer 28%
 - Urinvägsinfektion vanligast
 - striktur
- 88% avdjurägarenjda med operation

Bass M. Retrospective study of indications for and outcome of perineal urethrostomy in cats. JSAP 2005 May; 46(5):227-231.

Outcome



- Uppföljning 1-4 år
- MST 3,5 år med 47 kattersomlevdenärstudieavslutades
- 5 katter dog inom 14 dagar
- 6 katter överlevde i 6 månader
- 60% asymptotiskefter operation
- 10% kraftig symptom på FLUTD

Ruda L. Short-and long-term outcome after perineal urethrostomy in 86 cats with feline Lower urinary tract disease. JSAP 2012 Dec; 53(12):693-698

Prescrotal/Scrotal Urethrostomy



Prescrotal/Scrotal Urethrostomy



- Elliptical incision around scrotum
- Castration
- Retractor penile muscle retracted laterally
- Place interrupted sutures between SC and the tunic of the penis
- Small incision on midline of urethra
 - Minimize hemorrhage
 - Avoid lacerating dorsal surface
 - Prefer incision over catheter

Prescrotal/Scrotal Urethrostomy



Prescrotal/Scrotal Urethrostomy



Prescrotal/Scrotal Urethrostomy



- Incision extended 2.5-4 cm (5-8 X the diameter)
- Suture with single layer interrupted or continuous pattern
- Mucosa and fibrous tissue of urethral wall
- Dermis and epidermis of skin
- Precise approximation of skin to mucosa important
- Stoma will reduce by 1/2 to 1/3 in length after healing is complete

Prescrotal/Scrotal Urethrostomy



PrescrotalUrethrostomy



- Penile amputation och scrotal urethrostomy
 - Neoplaesi
 - Trauma
 - Obstruktion med sten
 - Priapism
 - Balanoposthitis
- Blödning
- 1 hund wound dehiscence och striktur

Burriw RD. et al. Penile amputation and scrotal urethrostomy in 18 dogs.
Veterinary Record. 2011 Dec 17; 169(25): 657

PrepubicUrethrostomy



- Salvage procedure
- Created on the ventral midline just cranial to the pelvic brim in cats and female dogs
- Parapreputial in male dogs
- Exact location depends on length of urethra
- Urethra transected after preserving maximal length
- Brought through an incision lateral to abdominal incision
 - Makesure it is not kinking

PrepubicUrethrostomy



- Adventitia surrounding the urethra sutured to linea alba or SC tissues with 2 interrupted sutures
- 1-2 cm of urethra should remain exposed above
- Spatulate urethra with a 5-10 mm incision on ventral surface
- Suture urethral mucosa to skin

PrepubicUrethrostomy



Prognos/Komplikationer



- 11/16 katter hade post operativakomplikationer
- 6 katteravlivades mellan 1-26 månader efter operation
 - Inkontinens
 - Hudnekros
 - Fortsattaproblem med FLUTD
- Mean survival time 13 månader

Baines SJ, et al. PrepubicUrethrostomy: a long term study in 16 cats. Vet Surg 2001 Mar-Apr; 30(2): 107-113



- Transpelvicurethrostomy
- Subpubicurethrostomy

Urethral Anastomosis



- Repair of traumatic transections
- Resection of strictures
- Surgical approach depends on location
- May need pubic, ischial or symphyseal osteotomy

Urethral Anastomosis



- Midline incision caudala abdomen
- Stay sutures in apex of bladder
- Urethral catheter advanced retrograde to the point of transection or stricture
- If needed, pass second urinary catheter antegrade from bladder

Urethral Anastomosis



- Careful dissection to identify urethra to be sutured but not cause vascular and neurogenic trauma
- Advance a urinary catheter across defect
- Identify mucosa (often retracts) and preplace several interrupted sutures around the circumference of the urethra
- Iftension, omental or muscle flap to reinforce
- Place transurethral catheter or cystostomy tube during healing

Urethral Anastomosis



Urethral Stricture



- Urethral trauma
- Neoplasia
- Inflammation
- Surgical intervention
- Balloon dilatation
- Stent
- Resection and anastomosis
- Urethrostomy

Urethral Stricture



- Treatment only indicated if causes signs of obstruction
- Untreated patients at greater risk for obstruction if form calculi or if degree of stricture progresses
- Stent placed under fluoroscopic guidance
- Rectalization should not be done after placement

Urethral Stent



Urethral Stent



- Katter och hundar
- Inkontinensvanligt beroende på position av stent
- Antegrade access i katt

Urethral Stent



Urethral Stent



Urethral Stent



Questions

