Cystotomy
Cystotomy for cystic calculi is performed occasionally in cats, but somewhat less frequently than in dogs. In cats undergoing perineal urethrostomy (PU) in which fine grit is present in the bladder, most of the grit can be expressed using voiding hydropulsion once the PU has been completed, and any residual calculi should pass during urination.

The selection of suture material is a critical success factor in urinary tract surgery. It is well documented that long lasting absorbable sutures and nonabsorbable sutures can act as a nidus for stone formation. Approximately 9.4% of recurrent canine uroliths, and 4% of recurrent feline uroliths, are suture-related. Because the urinary tract regains 100% of its original strength within two to three weeks, long-lasting absorbable sutures or nonabsorbable sutures are not necessary. Rapidly absorbable monofilament sutures such as Monocryl or Biosyn, both of which maintain effective wound support for approximately three weeks, are preferable to nonabsorbables or long-lasting absorbables such as PDS or Maxon. For cats and small dogs, 4-0 material can be used.

Cystotomy incisions are most often made in the ventral surface of the bladder in a relatively avascular area. Calculi are removed with a bladder spoon, and the bladder and urethra are checked for additional calculi by passing a catheter normograde and retrograde and flushing with saline. In male cats, it is very helpful to prep the prepuce and penis and include them in the surgical field. Some veterinarians routinely obtain postoperative radiographs to assure removal of all calculi; however, thorough flushing of the lower urinary tract should assure removal of all but the smallest calculi, and any residual calculi should pass during urination. A sample of bladder mucosa is submitted for culture.

During bladder closure, an effort should be made to avoid placing suture material in the lumen by excluding the mucosa from the suture line and including only the submucosa, muscularis, and serosa. This is easy to accomplish if the bladder wall is thick, but somewhat more difficult when the bladder wall is thin. Although the time-honored technique for bladder closure involves placement of two inverting suture lines, many surgeons now use a single simple continuous layer. A recent retrospective study (Thieman-Mankin et al. 2012) of dogs and cats undergoing routine cystotomy showed no difference in complication rates between double and single layer closure, and all complications that did occur were minor.

Perineal Urethrostomy
While nutritional management has decreased the frequency with which PUs are performed, the procedure remains a mainstay of the overall management of cats with FLUTD and urethral obstruction. PU is a surgery that can punish poor technique. There are several technical errors that must be avoided to reduce the risk of stricture, the most frequent and serious complication of PU. A detailed description of the surgical technique for PU will not be provided here; however, the critical errors to avoid are:

- **Failure to accurately suture urethral mucosa to skin.** Prior to each suture bite, the cut edge of the urethral mucosa should be identified. Urethral mucosa is white in color and can be readily identified in a blood-free field. The three dorsal sutures in a PU are most critical in maintaining a good urethral opening, although the urethral edges are difficult to visualize dorsally. Care should be taken to pass the needle down the urethral lumen as these sutures are placed, and pre-placement can aid in accurate placement. Subcutaneous fat should be trimmed away prior to placement of these sutures to assure that fat is not interposed between the skin and mucosa.

- **Making the stoma in the penile urethra.** The stoma should be located in the distal pelvic urethra, not the proximal penile urethra. The penile urethra is very narrow and therefore prone to stricture. The urethral incision should extend to or just beyond the bulbourethral glands. These glands are occasionally difficult to identify in castrated cats; if the glands cannot be identified, the urethral incision should be extended carefully until it enters a region of the pelvic urethra that is about 5mm in diameter. At this level, the opening should easily accept the widest dimension of a tomcat catheter.

- **Excessive tension at the stoma site.** Tension can cause small dehiscences in the PU site, allowing urine to leak into surrounding tissues, leading to inflammation, scaring, and stricture. Excessive tension often results from:
  - Incising the urethra too far proximally—the landmarks described above should be used.
Incising the skin dorsal to the prepuce too close to the anus—the skin incision should be halfway between the ventral aspect of the anus and the dorsal aspect of the scrotum.

Failure to transect the ischiocavernosus muscles and incise the fibrous tissue directly below the penis that attaches the penis to the pubis. These errors cause the penis to be tethered ventrally, creating tension on the stoma site.

PU stricture, when it does occur, typically occurs two to six months after surgery. Cats present for a recurrence of straining to urinate, and on examination have an extremely small—or absent—urethrostomy opening. The solution is creation of a new PU proximal to the initial PU site. On rare occasions, antepubic urethrostomy is necessary.

**Inflammatory Nasopharyngeal Polyps**

Nasopharyngeal (NP) polyps are inflammatory masses that usually occur in one- to five-year-old cats. The etiology is unknown, although viral upper respiratory infections earlier in life, and hereditary causes, are suspected. The polyps appear to arise from the middle ear epithelium, and usually grow into the nasopharyngeal area, or, more rarely, the external ear canal. NP polyps may produce upper respiratory stridor or dysphagia; external canal polyps produce chronic otitis externa. NP polyps are observed by retracting the soft palate forward under general anesthesia. They may occasionally be bilateral. The polyps are removed by gentle traction with forceps (in some cases, fairly forcible traction must be applied). Recurrence rates are reported to be lower when traction is combined with a ventral bulla osteotomy (VBO) to allow removal of the source of the polyp within the middle ear. My approach is to remove NP polyps with traction once and consider VBO if they recur.

VBO involves making a skin incision just medial to the angle of the mandible, and approaching the bulla by dissecting medial to the digastricus muscle. The bulla of the cat is very prominent and easy to identify. The bulla is entered with a Steinmann pin or air drill, and is then very gently curetted, lavaged, and cultured. The bulla of the cat is separated into dorsomedial and ventrolateral compartments by a septum; both compartments should be opened and inspected at surgery. A temporary Horner’s syndrome is almost inevitable after VBO in the cat, and the occasional cat with an inflammatory polyp will present with a mild Horner’s. Following surgery, the Horner’s syndrome typically resolves within a few weeks, although I have seen cats with a permanent mild Horner’s. Cats with Horner’s syndrome have decreased lacrimation and require artificial tears.

Antibiotics should be continued for two to four weeks if the culture is positive. Reported recurrence rates for cats with NP polyps treated by VBO are very low. There is evidence that a three to four week course of prednisolone may reduce recurrence rates after either traction removal or VBO.

**Idiopathic Megacolon**

Cats with idiopathic megacolon present with a history of chronic constipation and tenesmus, occasionally accompanied by anorexia, vomiting, and weight loss. The duration of signs may be from months to years. The colon is distended with hard feces that are easily palpable and easily visualized radiographically. The most important differential diagnosis is old displaced pelvic fractures, which can be ruled out with rectal examination or pelvic radiographs.

Approximately 50% of cats have an acceptable response to medical management, although the response may not be permanent. Medical management is largely a trial-and-error process, with different cats responding to different approaches. Medications that may be helpful include lactulose (1–3ml PO q 12–48 hours; many cats hate the taste), Miralax (1/8 tsp bid to soften the stool), and cisapride (2.5 mg sid-bid, requires compounding). Diets that may help include high fiber diets (Hill’s W/D, Royal Canin Gastrointestinal Fiber Response) and low fiber diets (Hill’s C/D). Unfortunately, intermittent manual deobstipation—an unpleasant procedure for the cat and veterinarian that requires heavy sedation or general anesthesia—is often a component of conservative management. Some internists advocate deobstipation using Go-Lytely administered by nasogastric tube; others have found cats to be highly stressed by this procedure.

Subtotal colectomy is the treatment of choice for megacolon unresponsive to conservative medical management. While the colon theoretically may be somewhat more dehiscence-prone than the small intestine, dehiscence is still unusual and the level of risk is very acceptable if the procedure is performed correctly. The entire colon is removed, leaving approximately 5 cm of proximal and 5 cm of distal colon. If the colon is markedly distended with feces, it may be helpful to make a small colostomy incision, remove the feces and close with a quick simple continuous
suture line prior to performing the resection. Following the resection, the remaining distal segment of colon often has a strong tendency to retract towards the pelvic canal, and must be firmly grasped with Doyen retractors. Prevention of mucosal eversion and suturing are as described for resection and anastomosis (R&A) in Part 1. The prognosis is excellent, although many cats have loose stools for the first four to five weeks after surgery.

Reference