AVOIDING & MANAGING COMPLICATIONS FROM PERINEAL URETHROSTOMIES IN CATS
Daniel D. Smeak, DVM, Diplomate ACVS
College of Veterinary Medicine
The Ohio State University
Columbus, OH

In male cats, perineal urethrostomy (PU) is performed to alleviate chronic or recurrent obstruction of the distal portion of the urethra. The procedure is most commonly performed for urethral obstruction associated with what was once termed feline urologic syndrome, or feline interstitial cystitis (FIC). This is not a benign procedure so owners must be aware of possible short- and long-term complications before considering surgery. In the hands of most experienced surgeons, perineal urethrostomy is not an extremely difficult procedure but technical errors are not uncommon. The procedure should be performed with minimal “stray dissection,” and result in a tension-free closure, with urethral mucosa and skin well apposed. In addition, the level of the urethrostomy must be at the relatively large pelvic urethra area to reduce stricture formation. Postoperative care must ensure that the patient cannot damage the repair. Urination must be monitored and urinary tract infection should be dealt with early before disastrous problems occur. Most of the following complications can be avoided if these principles are followed.

SHORT-TERM COMPLICATIONS

Hemorrhage
This is the most common short-term complication of perineal urethrostomy. Although mild bleeding can originate from subcutaneous vessels, serious problems are usually due to bleeding from the crura or corpus spongiosum tissue immediately surrounding the urethra. It is seldom necessary to reoperate to locate and control the source of bleeding in these cats, unless hemorrhage persists for several hours and will not stop with local pressure and ice packing.

Subcutaneous Urine Leakage
Urine infiltration into subcutaneous tissues can occur from leaks around the urethrostomy or iatrogenic lacerations of the urethra (particularly from aggressive catheterization). The problem is usually identified several days after surgery and the consequences may be severe. Intense pain during urination is the first sign; followed by local tissue swelling, post renal azotemia, wound dehiscence, skin discoloration (bruising), skin slough, and eventually death if the problem is not treated. Urine flow must be directed away from the subcutaneous tissues with a No. 5 French red rubber (Brunswick) catheter or appropriate silastic catheter (Cooke). Since most lacerations are longitudinal, seldom is reconstruction necessary; however, diversion of urine is required until the laceration is healed. Usually, catheters only need to be indwelling for three to five days. Small 1-cm skin incisions may help release urine from the subcutaneous tissues and maintain skin viability if leakage is caught early. When local tissue necrosis is severe, tissue debridement and open wound management is necessary. Reconstruction or permanent urinary diversion (antepubic urethrostomy) is delayed until the patient is stabilized and tissue is conducive for healing.

Reobstruction
Cats continue to produce calculogenic material following urethrostomy. Large blood clots or plugs form occasionally after surgery and these are usually easy to dislodge with gentle catheterization and flushing. Fluids should be administered intravenously for at least the first 24 hours after surgery to cause diuresis and help flush the urinary tract. More rarely, large blood clots form in the bladder after surgery. The bladder is firm and large resembling a urethral obstruction but catheterization into the bladder does not reveal an obstruction. These cats may need emergency cystotomy to evacuate the bladder clot and restore urine flow. Medical treatment of FIC should be continued after surgery.

Perineum Excoriation
This problem occurs from serum burn, urine scald, local wound infection, or suture-induced inflammation. Try to look for the underlying cause and treat it. Prevention from self-mutilation is critical and urine scald is minimized with the liberal use of petrolatum jelly surrounding the urethrostomy for the first one to two weeks after surgery.

Wound Dehiscence
Dehiscence usually occurs from self-trauma or wound infection. Local tissues are cleaned and debrided as necessary, and left to heal by second intention provided the dehiscence is not located at the proximal stoma area. In this instance, when local tissues are conducive to healing, repair is attempted. E. collars should be used until suture removal.

LONG-TERM COMPLICATIONS

Skin Fold Dermatitis
Chronic licking and foul odor, are the primary complaints of owners with cats that have skin fold dermatitis at the perineal urethrostomy site. Medical therapy consists of systemic antibiotics (against staphylococci); an E. collar should be applied to prevent continued self-trauma, and the skin fold should be cleaned routinely with antiseptic solutions. If this therapy fails, an episioplasty is performed similar to technique used for treatment of infantile or recessed vulvas in dogs. This procedure reduces the redundancy of skin folds at the dorsal commissure of the PU site.

Hypotonic Bladder
Following urethral obstruction, some male cats temporarily or permanently remain unable to voluntarily void urine effectively even though the urethral obstruction has been relieved. Once mechanical
obstruction has been ruled out in a cat with inappropriate urine retention, inadequate strength of detrusor contraction should be considered. Poor detrusor function can be due to a disorder in electrolyte balance (especially potassium), reflex dyssynergia, impaired detrusor contraction due to damage to sensory receptors in the bladder wall, or impairment of detrusor muscle function. Prolonged distention of the bladder results in disruption of the tight junctions between the smooth muscle cells impairing the propagation of the depolarization wave. Treatment of reflex dyssynergia due to excessive outlet resistance from myogenic spasm includes phenoxybenzamine (an alpha-adrenergic blocking agent). Alpha-adrenergic blockers reduce the strength of the internal urethral sphincter. Dosage of phenoxybenzamine for cats is 2.5 to 10 mg orally, once daily. The dosage should be low initially and increased by 2.5 mg increments every 3 to 5 days until satisfactory results occur. Side effects include hypotension, reflex tachycardia, and miosis (avoid use in cats with suspected or confirmed cardiovascular disease). Impaired detrusor activity usually is suspected when manual bladder compression without excessive force generates an adequate stream of urine. The bladder must be kept nearly empty for 5 to 14 days so that the integrity of the tight junctions between muscle fibers will be restored. Bethanechol, a parasympathomimetic drug that increases the strength of the detrusor muscle, may also be used for treatment. Dosage for bethanechol for cats is 1.25 to 2.5 mg orally every 8 hours. Watch for side effects of lacrimation, cramping, and diarrhea. Atropine is the antidote for overdose.

Incontinence

Preservation of normal urethral sphincter tone may help reduce the frequency of bacterial urinary tract infection in cats in which urethrostomy was done. In one study, bacterial urinary tract infection was found in 57% of cats with low urethral pressures and in 18% of cats with normal urethral pressures. Damage to the pudendal nerve during dissection is thought to cause incontinence after PU surgery. There are urethral branches of the pudendal nerve that course along the cranioventral aspect of the ischiocavernosus and ischiourethralis muscles. When the effects of minimal or extensive ventral dissection were evaluated in normal male cats undergoing PU, the results indicated that neither sharp nor blunt ventral intrapelvic dissection significantly alters their postoperative urodynamic status. Because the pelvic plexus and main branch of the pudendal nerve lie dorsal to the urethra, aggressive dissection there may impair lower urinary tract function. By preserving the dorsal aspect of the urethra’s attachment during the PU procedure, continence can be preserved.

Urinary Tract Infection

This complication is common and may be related to contamination from catheterization preoperatively or from loss of penile urethral length that is a structural and functional barrier to ascending infection. Preoperative infection rates of over 40% have been reported; postoperative infection occurs in about 20% of patients. Therefore, reevaluation for cystitis in these patients after surgery is critical.

Urethral Stricture

The incidence of stricture formation with the Wilson technique is about 12%. Development of strictures appears to be related to (1) surgical trauma, (2) excessive tension at the urethral-skin suture line causing scarring, (3) inaccurate apposition of the urethral-mucosal flap with the skin resulting in secondary intention healing, (4) urethral inflammation secondary to lower urinary tract infection, (5) urethral inflammation secondary to the use of indwelling catheters or aggressive catheterization, or (6) trauma from self-mutilation. It is critical that the surgeon use gentle tissue handling, suture the correct layers of tissue with good apposition, and, most important, avoid tension on the suture line by transsecting the penile attachments to the ischium. Urethral prostheses should be avoided for treatment of strictures since they produce irritation themselves, and require constant owner attention for cleaning of concretions and exudate.

Before attempting repair of the stricture, the surgeon should determine the cause of the stricture if possible, and eliminate the problem. Stricture formation most frequently occurs at the mucocutaneous junction. Most distal strictures can be handled similarly. An elliptical incision is made, with the urethrostomy located at the top of the ellipse. Dissection is performed cranially to free up about 2 cm of urethra, as described in the original technique. Depending on the manner in which the original technique was performed, either scar tissue will be found or, more commonly, the ischiocavernosus muscles will still be attached to the ischium. This could be due to partial muscle transection during the first surgery or reattachment of these muscles after being cut. Once the penis is freed up, it is retracted caudally and the urethra is cut along the dorsal aspect until an adequate size (3–6 mm) of urethral orifice is seen. Cutting the ishial attachments completely is critical to relieve tension on the anastomotic line since the pelvic urethra will be shorter than it was in the original technique. The scarred area surrounding the urethra is resected. Healthy urethral mucosa and skin is approximated in the same manner to form a flap as in the originally described technique. If there is insufficient urethra, an antepubic urethrostomy may be performed. In this procedure, a ventral skin incision is made extending halfway to the umbilicus from the pubis. The skin incision is continued through the subcutaneous tissues, linea alba, and peritoneum to enter the abdominal cavity. The bladder is brought through the abdominal incision, and cranial traction is applied. The urethra is clamped just cranial to the prostate and a transfixing suture is applied caudal to the clamp. Avoid the lateral pedicles in your dissection to preserve the blood and neural supply to the bladder and urethra. The urethra is transected just proximal to the clamp; a stay suture is placed in the end of the urethra, and the suture and urethra are pulled through a ventral
paramedian stab incision (located 0.5 cm off the midline just caudal to the level of the bladder neck). To avoid excessive tension on the urethral–skin junction, the abdominal incision is closed routinely before suturing the urethra to the skin. The end of the urethra is "fish-mouthed" using sharp-sharp iris scissors, creating flaps 0.5 cm in length. The flaps are sutured to the skin using a simple interrupted pattern of 4-0 nylon or polypropylene. Avoid twisting or kinking the urethra as this will cause a partial urethral obstruction. Postoperative management is similar to that described for the perineal urethrostomy.

RARE COMPLICATIONS

More rare complications associated with misguided surgical technique include urethrorectal fistula, anal incontinence, and perineal hernia. These problems are best avoided by reducing the amount and extent of dissection lateral and dorsal to the pelvic urethra.

References