Treatment with a combined cystopexy-colopecty for dysuria and rectal prolapse after bilateral perineal herniorrhaphy in a dog

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A 2.3-kg (5-lb) 9-year-old castrated male Yorkshire Terrier was evaluated by a local veterinarian because of a history of dysuria and pollakiuria of several days' duration. Rectal examination revealed bilateral perineal hernias, but perineal swelling was not evident. Results of urinalysis were within reference ranges. Examination of a pneumocystogram revealed that the urinary bladder was displaced caudally in the abdomen, similar to the condition known as pelvic bladder. A bilateral perineal herniorrhaphy with bilateral internal obturator transposition flaps was performed as described.1 No intraoperative difficulties were encountered, and the dog was discharged the next day. Urination and defecation were normal for 2 weeks. The dog then began to have dysuria and pollakiuria. Tenesmus and repeated rectal prolapse also were noted. A second pneumocystogram was performed, and the urinary bladder was located within the pelvis. The dog was referred to the University of Minnesota Veterinary Teaching Hospital (UMVTH) with a 2-week history of dysuria, tenesmus, and rectal prolapse when trying to defecate. On physical examination, the dog was straining, with abdominal contractions resulting in intermittent rectal prolapse and small amounts of expelled urine. Abdominal palpation revealed that the urinary bladder was not enlarged and was located caudally. Gentle rectal palpation revealed a bilaterally intact pelvic diaphragm, but redundant mucosal folds were evident. A small amount of fecal material that was produced during straining was

1. Disruption of supporting ligaments of the urinary bladder and colon can develop with postoperative tenesmus after bilateral perineal herniorrhaphy, resulting in caudal displacement of the urinary bladder and rectal prolapse. A combined cystopexy-colopecty can be used to successfully treat dysuria and rectal prolapse that develop as complications of bilateral perineal herniorrhaphy.

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formed and normal in appearance. Microscopic fecal analysis and immunofluorescence testing revealed no protozoan or helminth parasites. Other physical examination findings were unremarkable. On survey abdominal radiographs, the bladder was caudally displaced, but no other abnormalities were noted. Results of a CBC were within reference ranges. Serum biochemical analyses revealed high BUN concentration (41 mg/dL; reference range, 7 to 28 mg/dL), hypocalcemia (9.1 mg/dL; reference range, 9.3 to 11.4 mg/dL), and slight hypernatremia (151 mmol/L; reference range, 143 to 150 mmol/L). Urine obtained by cystocentesis had brownish-yellow color, occult blood, 3+ protein, > 300 RBCs and 40 to 50 WBCs/hpf, occasional calcium oxalate monohydrate crystals, and a few clumped epithelial cells. A urine sample was submitted for aerobic bacterial culture and susceptibility testing. The dog was admitted to the hospital for continued diagnostic tests and observation. Treatment with acepromazine (1.0 mg/kg [0.45 mg/lb], PO, q 12 h) was initiated to help reduce dysuria and tenesmus. The dog was observed during the next 2 days to monitor the extent and duration of dysuria, tenesmus, and rectal prolapse. Serum biochemical values returned to reference ranges, but dysuria and tenesmus persisted. An IV urogram (IVU) was performed and after the dog attempted to urinate was followed with sequential radiographs to assess the urinary tract and position of the bladder. The IVU, rather than a cystourethrogram, was performed to avoid altering the anatomic features that might be responsible for the condition. The bladder was displaced caudally, with the trigone located in the pelvic region (Fig 1); this position was evident on multiple radiographs obtained after attempts at urination. The dog was unable to completely empty the bladder. The bladder was easily catheterized for evacuation; therefore, a cystourethrogram was not performed. Bacteriologic culture of urine revealed nonhemolytic Escherichia coli and an Enterococcus sp; both organisms were susceptible to trimethoprim-sulfadiazine. The caudal displacement of the bladder was thought to impair urination. Because dysuria was accompanied by persistent recurring rectal prolapse, the recommended treatment was combined cystopexy-colopecty.

An enema was performed the evening before surgery to evacuate the colon, and a routine ventral midline approach to the abdomen was performed the following morning. The median ligament of the bladder was completely ruptured. The lateral ligaments of the bladder were ruptured bilaterally from their cranial attachments caudally to the location of the ureters and
There was laxity in the remaining ligamentous attachment, which allowed excessive mobility of the distal portion of the colon and rectum. Evaluation of the colon also revealed ruptured or stretched supporting ligaments. The peritoneal reflection at the colorectal junction was ruptured, and the short caudal descending mesocolon appeared to be stretched, allowing excessive mobility of the distal portion of the colon and rectum.

The colopexy was completed first. An assistant performed digital rectal palpation while the colon was advanced forward in the abdomen. The colon was advanced until redundant mucosal folds in the rectum were eliminated while avoiding excess tension on the rectum and colon. Prior to the colopexy, the areas to be sutured on the serosa of the colon and on the peritoneum were lightly abraded with a gauze sponge. The descending colon was then sutured to the left abdominal wall approximately half the distance between the linea alba and the sublumbar muscles by use of 3 longitudinal rows of 6 simple interrupted sutures per row with 3-0 prolene. Sutures were placed 5 to 10 mm apart in a ventral to dorsal direction through the transverse abdominal muscle and in a transverse direction through the colon. Beginning dorsally, rows were kept approximately 5 mm apart with the middle row of sutures placed along the antimesenteric border. Sutures were placed through the seromuscular and submucosal layers only in an effort to avoid entering the lumen of the colon. Care was taken to avoid the left deep circumflex iliac artery as it coursed through the left abdominal wall. After completion of the colopexy, light caudal traction was applied to the colon to evaluate the integrity of the attachment. The colon was firmly attached to the body wall, with no caudal movement during gentle traction.

A cystopexy was then performed to attach the bladder to the right abdominal wall, in a manner similar to the colopexy, to attach the colon to the left abdominal wall. A 5-F rubber catheter was used to empty the bladder, which was then partially refilled with saline (0.9% NaCl) solution to aid in manipulation and suture placement. A stay suture of 3-0 prolene was placed in the bladder apex, and cranial traction was applied to the bladder until light tension removed laxity on the urethra. The areas to be sutured were abraded as was done for the colopexy. Beginning dorsally, 3 longitudinal rows of 6 simple interrupted sutures of 3-0 prolene were placed between the bladder and the body wall, starting near the apex and progressing towards the trigone. Sutures were placed 5 to 10 mm apart with approximately 5 mm between rows. Sutures were placed transversely through the seromuscular and submucosal layers of the bladder wall and in a dorsal to ventral direction through the transverse abdominal muscle of the right abdominal wall. The middle row of sutures was placed approximately from the cranial extent of the ruptured lateral ligament of the bladder caudally along the remnants of the lateral ligament toward the trigone. One suture row was placed dorsal and the other ventral to the middle row. Care was taken to avoid the deep circumflex iliac artery associated with the right abdominal wall. Gentle traction was applied, and the bladder was filled and emptied to determine the effects of micturition on the strength of the cystopexy. None of the suture lines had evidence of leakage, and the integrity of the cystopexy was maintained during testing. The urinary catheter was removed. Abdominal closure was routine, and the dog recovered from anesthesia without complications.
The dog was urinating normally the day after surgery, and no tenesmus or rectal prolapse was noted. The dog was sent home 2 days after surgery with instructions to administer trimethoprim-sulfadiazine for 2 weeks and a fecal softener daily (0.25 teaspoon sprinkled on food q 12 h). The dog continued to do well during the next 2 weeks, with a 90% reduction in straining reported by the owner. The skin sutures were removed 15 days after surgery, and administration of the fecal softener was discontinued.

Eight weeks after the combined cystopexy-colopexy, the owner reported that the dog was clinically normal. Dysuria and tenesmus had completely resolved, and rectal prolapse had not recurred since the surgery. Results of a physical examination were unremarkable. The pelvic diaphragm was still intact bilaterally, and the bladder was palpated within the abdomen. A cystourethrogram revealed that the bladder was located in a functionally normal position within the abdomen and that the cystopty had maintained the attachment of the bladder to the right lateral body wall (Fig 2). Results of aerobic bacteriologic culture of urine were negative. The referring veterinarian reported that the dog was doing well 18 months after surgery with no clinical signs of dysuria, tenesmus, or rectal prolapse.

Perineal hernias occur most commonly in male dogs from 7 to 9 years of age. There appears to be a breed predilection for perineal hernias, although Yorkshire Terriers have not previously been included as 1 of these breeds. The development of perineal hernias begins with deterioration of the supportive function of the pelvic diaphragm musculature, which allows the rectal wall to stretch and deviate. Failure of the pelvic diaphragm also predisposes to protrusion of the pelvic and abdominal contents between the pelvic diaphragm and the rectum, resulting in swelling ventrolateral to the anus; caudal projection of the anus may be seen when the lesion is bilateral. Several theories regarding the etiopathogenesis of perineal hernias have been proposed, including neurogenic causes and senile muscular atrophy of the pelvic diaphragm. Although the predilection of male dogs with this condition suggests that sex hormones may be involved in the pathogenesis, the effects of androgens on pelvic diaphragm musculature have not been established. Enlargement of the prostate has been implicated in the initiation of tenesmus and, in some dogs, may lead to development of perineal hernia. However, prostatic enlargement is generally considered to be only a contributing factor. The dog reported here had been neutered at a typical young age, and its prostate was not enlarged. Thus, the cause for the perineal hernia in the dog described here, as in most cases, was not known.

The bladder of the dog reported here was caudally displaced with the trigone located in the pelvic region. However, the term pelvic bladder was not used to describe the abnormal location of the bladder. That term is used to describe a variation in bladder position that has been associated with incontinence and other urinary tract abnormalities. Pelvic bladder also is often a normal variation with no associated clinical signs.

The cause of urinary obstruction in dogs with perineal hernias has not been extensively evaluated. It is logical to surmise that caudal displacement or retroflexion of the urinary bladder kinks the urethra such that its lumen becomes occluded. Results of contrast urethrocytography performed during nonphysiologic compression of the abdomen in an affected dog are consistent with this hypothesis; however, urethral flexures have also been observed in dogs without voiding dysfunction. In addition, we are not aware of any studies confirming urethral kinking in conscious dogs.
Rectal prolapse occurs most commonly in young, parasitized dogs and cats. However, it has also been reported as a complication after perineal herniorrhaphy in dogs. The condition is usually transient and responsive to sedation. Recurrent prolapse that is unresponsive to reduction and placement of a purse string suture may require resection or colopexy. Because the rectal prolapse in the dog of this report was intermittent, neither a purse string suture nor resection was indicated and a colopexy was performed.

Colopexy has been recommended for treatment of recurrent rectal prolapse alone or with perineal hernia. In the dog reported here, the colopexy provided permanent resolution to the rectal prolapse. Similar results were also reported for 14 cases of rectal prolapse treated by use of colopexy.

The use of cystopexy and colopexy for the treatment of perineal hernias has been described. In 1 report of perineal hernia in a dog, a cystopexy and colopexy were combined with partial closure of the caudal defect in the pelvic canal. In that report, the indication for cystopexy was persistent recurring retroflexion of the bladder into the hernial sac. Retroflexion of the bladder is not uncommon in association with perineal hernias and can result in stranguria, which was 1 of the clinical signs in the dog reported here. However, a retroflexed bladder was not noted clinically or radiographically. Instead, the bladder was displaced caudally with the trigone located in a pelvic position. Although this position differs from that of bladder retroflexion, the clinical outcome in our dog suggested that the cystopexy provided long-term resolution to the dysuria; based on the 8-week postoperative cystourethrogram, the cystopexy was apparently permanent.

When performing a cystopexy or colopexy, it was originally suggested that sutures should not penetrate the lumen of the urinary bladder or colon when securing either organ to the abdominal wall. Although 1 report describes colopexy by use of sutures that penetrate the mucosa, subsequent reports warn against this practice. The major concern is that leakage and peritonitis can result if there is separation of the colon or urinary bladder from the abdominal wall. Even in the absence of separation, lumen penetration by sutures in the bladder can act as a nidus for urinary calculus formation. In the colon, this can result in contamination of the colopexy site. In 1 study, infection at the colopexy site was a suspected complication of inadvertent colonic lumen penetration. Thus, the current recommendation is that sutures penetrate only the seromuscular and submucosal layer of either structure.

Cystopexy and colopexy procedures have been described with 2 large sutures in each structure. For colopexy, 1 or 2 rows of simple interrupted sutures approximately 1 to 2 cm apart have also been used. In the dog described here, 3 rows of nonabsorbable sutures placed 5 to 10 mm apart were used for cystopexy and colopexy. Perhaps the additional row and greater number of sutures accounted for the permanence of the cystopexy in this dog, whereas only temporary effectiveness was described in 1 report. The smaller spacing between sutures used in our dog was attributable to the small size of the dog. A greater distance between sutures, as described, may be more appropriate in a larger dog.

In 1 study, 2 colopexy techniques were used: a simple suture technique and an incisional technique. Both techniques resulted in equally successful outcomes. In the dog reported here, the simple suture technique was used because it avoided an incision into the colon.

It was interesting that clinical signs of dysuria and tenesmus first improved postoperatively and then worsened 2 weeks later. Perineal surgery has been reported to cause tenesmus, resulting in rectal prolapse, and this may have been the reason for tenesmus and rectal prolapse in our dog. Alternatively, the urinary tract infection diagnosed after evaluation at the UMVTH may also have caused the dysuria and tenesmus. This is supported by a report of cystitis as a predisposing factor leading to rectal prolapse. Based on the pneumocystogram performed by the referring veterinarian, our dog had evidence of ligamentous injuries prior to perineal herniorrhaphy; caudal displacement and inability to empty the bladder completely may have resulted in urinary tract infection. Regardless of the inciting cause of the recurrence of dysuria and tenesmus, we believe that further disruption of supporting ligaments and displacement of the bladder and colon accounted for the progression of clinical signs. We hypothesize that when the dog attempted urination, the bladder was forced caudally, kinking the proximal portion of the urethra and preventing urination. This appeared to have caused stretching of the detrusor muscle in the caudal portion of the neck of the bladder and trigone region from chronic tenesmus. This dilatation of the bladder neck was apparent on the preoperative IVU but had resolved by the 8-week postoperative cystourethrogram.

Cystopexy and colopexy have been used together as a sole treatment for perineal hernia or as a preliminary procedure prior to definitive hernia repair. However, to the authors' knowledge, this is the first description of a combined cystopexy and colopexy to treat dysuria and rectal prolapse as complications after bilateral perineal herniorrhaphy. On the basis of results reported here, a combined cystopexy-colopexy can be used successfully to treat this condition when the cause is determined to be bladder displacement with mechanical interference to urination accompanied by rectal prolapse.

Metamucil, The Procter & Gamble Co, Cincinnati, Ohio

References


