Congenital Urethrorectal Fistulas

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ABSTRACT: Congenital urethrorectal fistula is an uncommon condition in dogs, cats, and horses. Animals typically present with clinical signs consistent with urinary tract infection or the passage of urine from the anus is observed. Other urogenital or gastrointestinal congenital defects are usually present. The urethrorectal fistula is best identified by using positive-contrast retrograde urethrography. Treatment is surgical excision of the fistula typically through a ventral pubic symphysiotomy. The fistula can be catheterized preoperatively to aid in identification and resection of the fistula during surgery. With successful excision, the long-term prognosis can be excellent.

Congenital urethrorectal fistulas connect the lumens of the urethra and large bowel and are considered a rare defect in animals and humans. These fistulous tracts lead to recurrent urinary tract infection (UTI), hematuria, dysuria, and passage of urine from the anus. This condition is more commonly seen in males. Formation of the fistulous tract occurs in utero, and clinical signs are usually present from birth. However, diagnosis of the defect may not be made for several months or years due to owner delay or inaccurate diagnostic techniques. This defect may be diagnosed along with other congenital anomalies, most frequently atresia of the anus or rectum.

The hallmark signs of urethrorectal fistula are dribbling or leakage of urine from the rectum or simultaneous urination from the anus and urethra. Additional clinical signs are dysuria, pollakiuria, hematuria, perianal dermatitis, and chronic or recurrent UTIs. *Escherichia coli* and *Proteus* species are the most commonly isolated bacteria from urine culture. *Pseudomonas*, *Staphylococcus*, and *Streptococcus* species have also been cultured. Struvite uroliths have also been seen in conjunction with urethrorectal fistulas. Diagnosis requires careful physical examination of the rectum and proper radiographic techniques. Fistulectomy is the appropriate treatment, and when done correctly, the prognosis is excellent. This article discusses the pertinent anatomy, embryologic formation, diagnosis, treatment, and prognosis and reviews the reported veterinary cases.

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ANATOMY AND EMBRYOLOGIC FORMATION

The cause of congenital urethrorectal fistula formation is not completely understood. Embryologically, formation of the urorectal fold divides the cloaca into the rectum dorsally and urogenital sinus ventrally. When this division is complete, the urorectal fold has come into contact with the cloacal membrane, which then ruptures, providing separate openings for the urogenital and gastrointestinal systems. The caudal portion of the urogenital sinus differentiates into the urethra. Most literature reports the cause of fistula formation to be failure of the urorectal septum to completely divide the cloaca into an anterior urethrovescical segment and a posterior rectal segment. Other explanations include rupture of the cloacal membrane prior to coming into contact with the urorectal fold or a necrotizing or inflammatory process in utero leading to perforation of the rectum with subsequent fistula formation. In veterinary literature, the pelvic urethra was the area involved in all of the fistulas reported in males. It is important to note that the entire female urethra is homologous with the pelvic portion of the male, allowing for similar mechanisms to result in fistulous tract formation in both genders. The urethra is mostly transitional epithelium. It changes to stratified squamous epithelium near the urethral orifice. When examined histologically, the fistulous tracts have been consistent with urethral tissue. Histopathology of the fistula lumen reveals tracts of transitional epithelium, with and without smooth muscle and apocrine glands. This suggests that formation of the fistula is from the urogenital sinus rather than the rectum.

DIAGNOSIS

Simultaneous urination from the rectum and urethra or dribbling of urine from the rectum is pathognomonic for urethrorectal fistulas. It is important to observe the animal during urination, and a rectal examination may reveal the opening of the fistulous tract. However, sedation or general anesthesia is often required for thorough rectal examination and to palpate and observe the fistula opening. Urinalysis, urine bacterial culture, and antibiotic sensitivity from samples retrieved by cystocentesis are critical to identify associated UTIs. Serum biochemistries and complete blood cell count (CBC) will contribute to an overall picture of the animal’s health status; therefore, treatment of complicating factors can be addressed early.

Positive-contrast retrograde urethrography is the best method for diagnosis of urethrorectal fistula. Micturating cystourethrography has also been described as a successful technique for diagnosis. Fluoroscopy can be used with these techniques to aid in diagnosis. Pressure may need to be placed on the pelvic urethra rectally during the contrast study to help enhance flow through the fistula. Survey radiographs, double-contrast cystography, and pneumocystography have all failed to aid in diagnosis, as has rectal examination and colonoscopy. Once the fistula is diagnosed, it may be catheterized rectally. The catheter should be left in place to aid localization of the fistula during surgical fistulectomy.

TREATMENT AND PROGNOSIS

Fistulectomy is the appropriate treatment for urethrorectal fistula. Ventral pubic symphysiotomy or pubic osteotomy is the most commonly described approach to the fistula. In one dog, a perineal approach was used successfully. Preoperative placement of a catheter into the fistula via the rectum aids in the localization of the fistula, making dissection around the defect much easier. Once the fistula has been identified and dissected from surrounding tissue, double ligation is performed and the fistulous tract removed.

After surgery, the patient should receive supportive care and proper analgesia. Indwelling urinary catheterization does not seem necessary because most animals will urinate immediately after recovery. Short-term postoperative dribbling from the urethra is possible but should resolve within 1 to 2 days. Some strangury and hematuria is expected postoperatively. Associated clinical problems such as UTI or urolithiasis should be treated appropriately. Follow-up urinalyses may be indicated to determine the presence of recurrent or resistant UTIs. Of the seven dogs that have had surgical excision with postoperative outcome reported, five have resumed normal urination (Table 1).

VETERINARY DOCUMENTATION

To date, urethrorectal fistulas have been reported in only 10 dogs, two cats, and four horses. Of these, eight dogs, one cat, and four horses were male. Five of the 10 dogs were English bulldogs, contributing to the idea that the condition may be heritable. The age of diagnosis of urethrorectal fistula in small animals varies widely, from 7 weeks to 10 years (median 1.6 years). However, all of the reported cases had signs since the first few weeks or months of life (Table 1). Two dogs reportedly had struvite uroliths associated with cystitis. In one report, the authors hypothesized that the urethral obstruction from uroliths most likely forced urine to flow in the path of least resistance through the congenital urethrorectal fistula. Urine scald caused perianal dermatitis in three dogs.
### Table 1. Cases of Urethrorectal Fistula Reported in the Veterinary Literature

<table>
<thead>
<tr>
<th>Signalment</th>
<th>Clinical Signs</th>
<th>Diagnostics</th>
<th>Approach Used for Fistulectomy</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year-old male Yorkshire terrier</td>
<td>Recurrent cystitis, hematuria</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual pubic symphysiotomy</td>
<td>Not reported</td>
</tr>
<tr>
<td>3-year-old male Labrador retriever</td>
<td>Recurrent cystitis, hematuria, pollakiuria</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Perineal</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>1-year-old male miniature poodle</td>
<td>Simultaneous urination from anus and urethra, recurrent cystitis, hematuria, ureolithiasis, perianal dermatitis</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual pubic symphysiotomy</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>7-year-old miniature male poodle</td>
<td>Leakage of urine from the anus, recurrent cystitis, perianal dermatitis</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual pubic symphysiotomy</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>2-year-old female miniature poodle</td>
<td>Leakage of urine from the anus</td>
<td>Micturating cystourethrography</td>
<td>Not reported</td>
<td>Euthanized after two unsuccessful surgeries</td>
</tr>
<tr>
<td>4-month-old male English bulldog</td>
<td>Simultaneous urination from the anus and urethra, recurrent cystitis</td>
<td>Micturating cystourethrography</td>
<td>Not reported</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>9-month-old English male bulldog</td>
<td>Simultaneous urination from the anus and urethra, hematuria</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual pubic symphysiotomy</td>
<td>Died 1 day after surgery due to respiratory complications</td>
</tr>
<tr>
<td>14-month-old male English bulldog</td>
<td>Recurrent cystitis, hematuria, dysuria, ureolithiasis</td>
<td>Positive-contrast retrograde urethrography</td>
<td>None</td>
<td>Euthanized at owner’s request</td>
</tr>
<tr>
<td>4.5-year-old male English bulldog</td>
<td>Simultaneous urination from anus and urethra, recurrent cystitis, hematuria, dysuria, perianal dermatitis, tenesmus</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual pubic symphysiotomy</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>7-week-old male domestic shorthair cat</td>
<td>Passage of feces through urethra, tenesmus</td>
<td>Positive-contrast retrograde urethrography</td>
<td>None</td>
<td>Euthanized due to atresia ani</td>
</tr>
<tr>
<td>10-year-old female cat (breed unknown)</td>
<td>Hematuria, dysuria, pollakiuria</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Ventrual midline celiotomy</td>
<td>Surgery curative, resumed normal urination</td>
</tr>
<tr>
<td>3-day-old male Appaloosa</td>
<td>Atresia ani</td>
<td>None</td>
<td>Perirectal</td>
<td>Three surgeries to correct both problems; normal at 19 months after surgery</td>
</tr>
<tr>
<td>Neonatal male quarter horse</td>
<td>Atresia ani</td>
<td>Barium enema following corrective surgery for atresia ani</td>
<td>None</td>
<td>Euthanized</td>
</tr>
<tr>
<td>Neonatal male quarter horse</td>
<td>Atresia ani, ventral tail adhered to sphincter area</td>
<td>Barium enema following corrective surgery for atresia ani</td>
<td>Not reported</td>
<td>Developed pneumonia after surgery and died</td>
</tr>
<tr>
<td>Neonatal male Arabian</td>
<td>Atresia ani</td>
<td>Positive-contrast retrograde urethrography</td>
<td>Not reported</td>
<td>Euthanized at 8 months of age due to persistent rectal prolapse</td>
</tr>
</tbody>
</table>
**History**

An 18-month-old male English bulldog was presented to the Colorado State University Veterinary Teaching Hospital for a 6-week history of recurrent UTIs and intermittent hematuria, without dysuria or pollakiuria. The owner noted that the dog occasionally voided urine rectally while posturing to urinate. The owner also complained of urine dribbling from the anus when the dog had the urge to urinate and after voiding for 10 to 12 seconds. Urinalysis performed previous to presentation revealed hematuria, proteinuria, pyuria, phosphate crystals, and bacteria. *Proteus mirabilis* was isolated on urine bacterial culture. Rectal palpation was described as normal.

**Clinical Signs and Diagnosis**

On physical examination, the dog was healthy with normal temperature, pulse, and respiration. The prostate was lobulated but symmetrically smooth on rectal palpation. A CBC, serum biochemistries, and urinalysis were evaluated. Urine was collected via cystocentesis. The CBC and serum biochemical panel were within normal limits. The urinalysis showed 2+ blood as well as 15 to 20 white blood cells/high-power field and 4 to 5 red blood cells/high-power field with no bacteria. Radiographic evaluation included survey abdominal radiographs and a positive-contrast cystourethrogram. With the exception of several hemivertebrae in the caudal thoracic region, abdominal radiographs were unremarkable. Following evacuation of urine, the urinary bladder was filled with iodinated contrast material via a 6-Fr urinary catheter. The bladder appeared to be within normal limits. The urinary catheter was then slowly withdrawn while injecting contrast medium. As the tip of the catheter passed the level of the caudal sacrum in the pelvic urethra, contrast medium was seen diverting dorsocaudally into the rectum. Based on these findings, a diagnosis of congenital urethrorectal fistula was made.

**Surgical Procedure**

Under general anesthesia, a thorough rectal examination was performed. A defect was felt in the ventral rectal mucosa approximately 4 to 5 cm proximal to the anus. An 8-Fr urinary catheter was easily placed into the defect and urine was retrieved from the bladder. A ventral midline/periprepucial incision was made, extending from the xiphoid to the caudal pubis. The adductor muscles were separated from the midline of the pubis and ischium and then subperiosteally elevated from the pubis, making sure to avoid the obturator nerves. Holes were drilled using 0.062-mm Steinmann pins on each aspect of the proposed osteotomy sight, and the osteotomies were made using an osteotome. The portion of the pubis was removed and placed in sterile saline. The urethrorectal fistula was easily identified caudal to the prostate by palpation of the previously placed urinary catheter. The fistula was dissected and double ligated with 2-0 nonabsorbable monofilament suture, and approximately 1.5 cm of fistulous tract was removed. Absorbable monofilament suture was used to oversew the distal portion of the

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**A**—Positive-contrast urethography showing diversion of contrast dorsocaudally into the rectum.

**B**—Catheterization of the urethrorectal fistula from the rectum demonstrating retrieval of urine.
Five of the nine dogs reportedly had other congenital defects. One dog reportedly had an enlarged clitoris and evidence of masculinization of the external genitalia and was diagnosed as a pseudohermaphrodite. A male miniature poodle had a urethroperineal fistula as well as a urethrorectal fistula. This dog also had congenital urethral duplication, a defect in which two independent noncommunicating urethras empty through separate orifices. Evaluation of an excretory urogram combined with a pneumocystogram revealed that both ureters of one English bulldog entered the bladder in the middorsal region rather than at the trigone. This congenital anomaly was confirmed during exploratory surgery. Hemivertebrae and block vertebrae were reported in one miniature poodle and the English bulldog discussed in the case report. Hemivertebrae and block vertebrae are congenital anomalies in dogs and cats; however, they are usually incidental. Vertebral malformations have been associated with urinary tract malformations in humans.

Tenesmus and failure to pass feces were the

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**Postoperative Results**

The dog was observed postoperatively in the critical care unit for approximately 18 hours, during which the animal was maintained on IV physiologic saline (40 ml/hr), constant-rate infusion fentanyl (1 to 4 µg/kg/hr) and IV cefoxitin (22 mg/kg tid). The urinary catheter was pulled immediately after surgery. The dog urinated a normal stream with only mild strangury and hematuria within 4 hours. The dog was released from the hospital after 24 hours of observation. Amoxicillin with clavulanic acid (13.75 mg/kg q12h PO) was administered for 10 days, and acetaminophen with codeine (1 mg/kg codeine PO) was given for 5 days for pain.

On the 14-day recheck, the owner reported that the dog was urinating normally. The sutures were removed. A urinalysis was performed and was within normal limits. One month after discharge, the owner reported a 2-day duration of hematuria. Physical examination revealed no abnormalities. Urinalysis (voided and cystocentesis) and urine bacterial culture were performed. The dog was discharged with enrofloxacin (5 mg/kg q12h PO for 7 days) while awaiting laboratory results. Increased blood was the only abnormality found on urinalysis and there was no growth on bacterial culture. No recurrence of gross hematuria or abnormal urination has been noted since that time. The dog has currently gone 20 months without complications.
presenting signs of one cat. This kitten also had atresia ani, which would explain the unusual presentation of passage of feces in the urine. Another cat with this condition had signs consistent with UTI. The congenital urethrorectal fistulas of the four horses were all associated with other multiple congenital anomalies (e.g., anal atresia, atresia ani). Comparing with urethrorectal fistulas in humans

Congenital urethrorectal fistulas in humans are most commonly diagnosed in children and are seen twice as frequently in males as in females. In children, these defects are also usually diagnosed with other congenital anomalies, most frequently atresia of the anus or rectum. Symptoms described in humans include UTI and passage of gas and feces in urine but only occasionally passage of urine into the rectum. Retrograde urethrogram, voiding cystourethrogram, and radiographic study of the colon are common diagnostic techniques used in humans. Voiding cystourethrogram is preferred over endoscopic procedures. One human study reported poor diagnostic results using computed tomography scan but noted its usefulness in delineating the surrounding anatomy at the time of surgery. Many human patients are not diagnosed until later in life when they develop hypercholesteremic metabolic acidosis from bowel absorption of urine, epididymitis, or UTI or complain of infertility or passage of urine via the rectum.

The human literature reports rare instances of spontaneous closure or requirement of a temporary diverting colostomy; these circumstances have not been reported in the veterinary literature. Several surgical techniques, including perineal, transabdominal, anterior transanorectal, perianal, and posterior sagittal approaches, have been described in humans. Each of these methods has advantages and disadvantages, and choices seem to be based largely on surgeon preference. The human literature also reports a good prognosis following correction of congenital fistulas but reports common recurrence in cases of acquired fistulas.

Conclusion

Congenital urethrorectal fistula is an uncommon defect seen in both animals and humans. Although the embryologic formation of these fistulas is not completely understood, it is possible that the defect is heritable in English bulldogs. With this in mind, neutering patients with urethrorectal fistula may be recommended. However, it is not recommended that elective surgical procedures be performed during surgery for urethrorectal fistulas because it is a contaminated procedure. The most common presenting complaints are recurrent UTI, hematuria, dysuria, and passage of urine from the anus. These patients commonly have other congenital defects of the urogenital or digestive tract.

Diagnosis of urethrorectal fistula is best made by positive-contrast retrograde urethrography, and the treatment is via fistulectomy. Ventral pubic symphyseotomy is the approach most commonly described. When the fistula is successfully excised, dogs can have an excellent long-term prognosis.

References


**ARTICLE #4 CE TEST**

The article you have read qualifies for 1.5 contact hours of Continuing Education Credit from the Auburn University College of Veterinary Medicine. *Choose the best answer* to each of the following questions; then mark your answers on the postage-paid envelope inserted in *Compendium*.

1. Which of the following embryologic structures differentiates into the urethra?
   a. cranial portion of the urogenital sinus
   b. caudal portion of the urogenital sinus
   c. mesonephric duct
   d. caudal portion of the urorectal fold

2. Most literature agrees that any of the following may be explanations for congenital urethrococcal fistula formation except
   a. failure of the urorectal septum to completely divide the cloaca.
   b. rupture of the cloacal membrane prior to contacting the urorectal fold.
   c. failure of complete closure of the mesonephric duct.
   d. perforation following an in utero inflammatory process.

3. Congenital urethrococcal fistulas are believed to form from
   a. urogenital sinus.
   b. cloacal membrane.
   c. urorectal septum.
   d. rectum.

4. Which of the following statements regarding urethrococcal fistulas is false?
   a. Several other congenital anomalies have been reported concurrently.
   b. Concurrent signs are recurrent UTI, perianal dermatitis, and urolithiasis.
   c. English bulldogs may be predisposed.
   d. Double-contrast cystography is the best method of diagnosis.

5. Which clinical sign is considered pathognomonic for urethrococcal fistulas?
   a. recurrent UTIs
   b. simultaneous urination from the urethra and rectum
   c. urinary incontinence
   d. pollakiuria

6. The best method for diagnosing urethrococcal fistula is
   a. survey radiography.
   b. rectal examination.
   c. positive-contrast retrograde urethrography.
   d. colonoscopy.

7. The appropriate treatment for urethrococcal fistula is
   a. ligation of the fistula.
   b. ligation of the urethra.
   c. fistulectomy.
   d. coil occlusion of the fistula.

8. Which of the following postoperative procedures is not appropriate following the treatment of urethrococcal fistula?
   a. treatment of concurrent clinical problems (e.g., urolithiasis, UTI)
   b. treatment with stool softeners in order to allow easier passage of feces
   c. removing the urinary catheter
   d. providing proper analgesia (e.g., opiates, NSAIDs)

9. What type of tissue typically lines urethrococcal fistulas?
   a. columnar epithelium
   b. stratified squamous epithelium
   c. transitional epithelium
   d. smooth muscle

10. When the fistula is successfully excised, dogs can have
    a. an excellent prognosis.
    b. a fair prognosis.
    c. a guarded prognosis.
    d. a poor prognosis.