

# Radiographic Diagnosis of a Rectourethral Fistula in a Dog

An English bulldog was referred to the Veterinary Medical Teaching Hospital–University of Wisconsin (VMTH-UW) for re-evaluation of an 8-year history of chronic, recurrent prostatitis and cystitis. The patient was first referred to the VMTH-UW at 11 months of age with a history of antibiotic-responsive hematuria and stranguria. Four urinary tract contrast studies were performed during the 8-year time span; however, a rectourethral fistula was not diagnosed until the fourth study. The article presents a literature review of rectourethral fistula, describes the case management of the dog in this study, and provides an explanation as to the potential reasons the fistula was not diagnosed on the three previous imaging studies. *J Am Anim Hosp Assoc* 2001;37:573–576.

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## Introduction

Rectourethral fistulas may occur either as congenital or acquired anomalies in humans and animals.<sup>1-8</sup> Urethral anomalies are rare and usually occur in association with other congenital malformations.<sup>9-12</sup> This paper describes the case of a rectourethral fistula, without any other demonstrated congenital anomalies, in a male English bulldog. Other cases noted in the literature with a similar diagnosis include dogs (n=7),<sup>13-16</sup> a male calf (n=1),<sup>17</sup> an equine gelding (n=1),<sup>9</sup> and a spayed female cat (n=1).<sup>18</sup> The presenting signs are evident at a young age and include simultaneous urination via the penis and rectum (in the male) or vulva and rectum (in the female), hematuria, dysuria, and recurring urinary tract infections (UTI).<sup>1,3,4,6,19</sup> Diagnosis of the fistula is accomplished with the aid of contrast radiography, either by retrograde colonography or by retrograde or antegrade (i.e., voiding) contrast urethrography.<sup>1,3,4,6,19</sup> Previous reports describe survey abdominal radiographs as being unremarkable, and the contrast radiographic visualization of the fistula as being quite difficult, requiring a continuous flow of contrast.<sup>11</sup> Treatment is by surgical excision and medical management of the UTI.<sup>1,3,4,6,19</sup>

## Case Report

An 11-month-old, 23-kg, intact male English bulldog was first referred to the Veterinary Medical Teaching Hospital–University of Wisconsin (VMTH-UW) with a history of antibiotic-responsive hematuria and stranguria. The owner reported that frank blood had been dripping from the penis. Upon initial presentation to the referring veterinarian, 3+ blood and numerous bacteria were identified on urinalysis. No abnormalities were noted on a positive-contrast cystogram performed by the referring veterinarian. On general examination at the VMTH-UW, the prostate was of normal size but was irregular on palpation. Based on the patient's age, the suspected causes of the hematuria were a UTI, possibly the result of a congenital anomaly (e.g., ectopic ureter or urethral



**Figure 1**—Contrast urography performed in an 11-month-old, male English bulldog at first presentation to the Veterinary Medical Teaching Hospital—University of Wisconsin (VMTH-UW). A left-lateral, oblique view of a double-contrast cystogram following a urethrogram is shown. The occurrence of mild, diffuse thickening (2 mm) of the urinary bladder wall is observed. A localized collection of contrast extending from the caudal prostatic urethra (arrows) is present. A radiographic diagnosis of mild cystitis and probable prostatitis was made.

anomaly). Prostatitis was considered to be a likely reason for the palpably irregular prostate. A urethrogram and double-contrast cystogram were performed; however, no congenital anomalies were observed [Figure 1]. Ultrasonography of the prostate, urinary bladder, and kidneys was also performed, with the only abnormality noted being a small area of suspect calcification within the prostatic urethra. Cultures of the urethra and of urine collected by cystocentesis demonstrated the presence of  $\alpha$ -hemolytic *Streptococcus*. A diagnosis of mild cystitis and probable prostatitis was made. A 6-week regimen of amoxicillin-clavulanic acid<sup>a</sup> (375 mg per os [PO] *bid*) was prescribed to treat the cystitis.

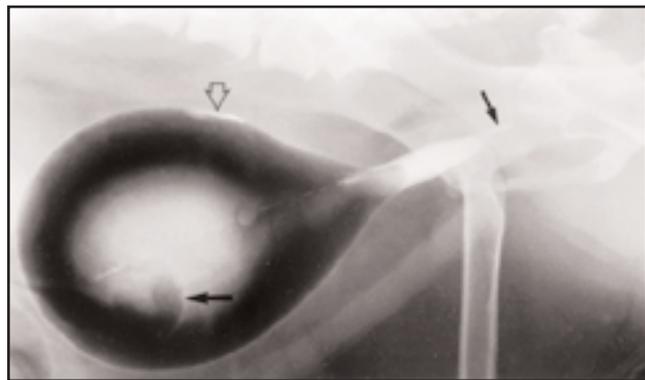
On the second VMTH-UW presentation, 8 months (19 months of age) after the first presentation, the patient continued to experience recurrent cystitis. On physical examination, a thickened bladder wall and a normal-sized but irregular prostate were noted. The complete blood count (CBC) and serum biochemistry profile were within reference ranges. A slightly enlarged prostate was diagnosed on ultrasonography, and areas of hypoechoogenicity suggested fluid accumulation in the prostate. Culture of the urine collected by cystocentesis and fluid from a prostatic wash yielded *Escherichia coli* (*E. coli*), *Klebsiella pneumoniae*, *Proteus mirabilis*, and two strains of enterococci. Castration was performed to improve the chances for recovery from chronic prostatitis. The patient was discharged with trimethoprim-sulfa<sup>b</sup> (TMS; 960 mg PO, *sid*).

On the third VMTH-UW presentation, 6 months (25 months of age) after the second presentation, the patient returned for evaluation of his immune system as a potential cause for the recurrent cystitis. A systemic immunoincompetence was suspected, involving a defect in either the cell- or humoral-mediated immunity. The patient was diagnosed to be immunocompetent, as immunoglobulin quantitation and lymphocyte blastogenesis were within reference

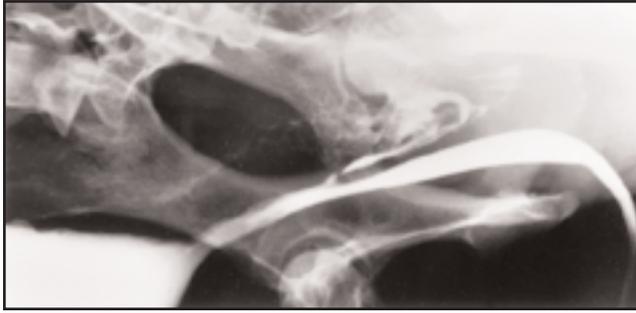
ranges. A double-contrast cystogram was performed to assess progression of the cystitis [Figure 2]. A small diverticulum at the level of the prostate was observed and suspected to be the site of urine retention. The patient was discharged with an 8-week course of ciprofloxacin<sup>c</sup> (250 mg PO, *bid*) for cystitis.

At 8.5 years of age, the patient began urinating from the rectum. Physical examination and CBC were within reference ranges, but a mixed bacterial infection involving both gram-positive and gram-negative bacteria was found on a culture of urine collected by cystocentesis. A rectourethral fistula in the prostatic urethra was diagnosed via a urethrogram [Figure 3]. During injection of an undiluted contrast agent<sup>d</sup> into the prostatic urethra, contrast was seen escaping at the level of the prostatic urethra through a fistula into the rectum. The urinary tract was further evaluated by an excretory urogram/double-contrast cystogram to look for evidence of pyelonephritis or progression of the cystitis [Figure 4]. The radiographic diagnosis was chronic, severe cystitis and bilateral ureteral dilatation, probably associated with chronic inflammation at the ureterovesicular junction.

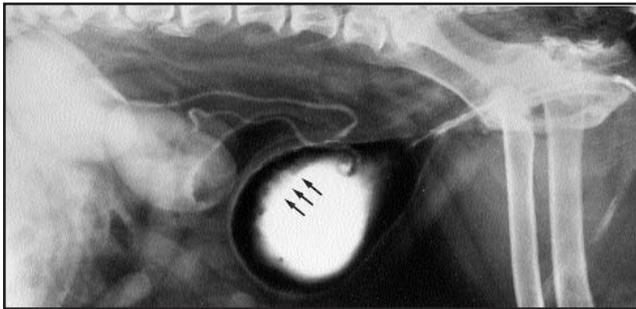
Surgical excision of the rectourethral fistula was performed. The fistula was transected, and the urethral defect was closed through a ventral urethrotomy. Upon histopathological examination of the resected fistula, a tube with a lumen, mucosa, and muscularis were found. The patient was discharged to the owner with a 2-week course of ciprofloxacin (250 mg PO, *bid*), metronidazole<sup>e</sup> (750 mg PO, *sid*), and amoxicillin<sup>f</sup> (250 mg PO, *bid*). One week after release, *Proteus spp.* was cultured in the urine. Treatment with enrofloxacin<sup>g</sup> (68 mg PO, *bid*) ameliorated the infection. The patient returned to the referring veterinarian four times in the subsequent 2 years for unrelated problems. The dog experienced no further complications from the fistula.



**Figure 2**—At 25 months of age, the English bulldog from Figure 1 was presented to the VMTH-UW for a third time. On a left-lateral, oblique view of a double-contrast cystogram, mild thickening of the urinary bladder wall was again seen with localized adherence of contrast to the dorsal bladder wall (open arrow). A filling defect is seen in the contrast puddle (large arrow). The previously noted, irregular contrast filling in the prostatic urethra is again seen (small arrow). The radiographic diagnosis was persistent cystitis and probable intraluminal blood clot in the bladder. The prostatic irregularity was thought to be a prostatic diverticulum or dilated duct.



**Figure 3**—At 8.5 years of age, the English bulldog from Figure 1 was presented to the VMTH-UW for a fourth time. A left-lateral, oblique view centered at the pelvic inlet. A positive-contrast cystogram and urethrogram were performed. During injection of an undiluted contrast agent into the prostatic urethra, contrast can be seen escaping at the level of the prostatic urethra through a fistula into the rectum.



**Figure 4**—A lateral view of an excretory urogram/double-contrast cystogram performed after the urethrogram [see Figure 3]. Following removal of positive contrast, the bladder was distended with carbon dioxide, after which 50 cc of contrast agent was injected intravenously and an excretory urogram was performed. The ureters are tortuous and moderately dilated (3.5 mm), while the renal pelvises appear normal. The bladder wall is considerably thicker than was seen in previous studies. An irregular-filling defect is seen in the bladder (arrows). The contrast which stains the hair over the perineum was due to the escape of contrast through the rectum during the urethrogram. Based on the radiographic findings, a diagnosis was made of chronic, severe cystitis and mild, bilateral ureteral dilatation, probably associated with chronic inflammation at the ureterovesicular junction.

## Discussion

The rectourethral fistula diagnosed in this 8-year-old bulldog was likely present since birth. On a ventrodorsal view of the referral positive-contrast cystogram/urethrogram, done when the dog was less than 9 months old, it appeared that contrast was escaping from the prostatic urethra. That finding was overlooked, as it was not seen on the lateral views and no oblique views were taken. Radiographically, evidence of urethrorectal fistula was not convincing until the fourth contrast study, when the catheter tip was placed just caudal to the prostate, which, during the pressure of injection, allowed contrast to flow into the fistula. In the first two urethrograms performed at the VMTH-UW [Figures 1, 2], placement of

the catheter may have compromised evaluation because of incomplete distention of the prostatic urethra. Using normo-grade filling of the urethra (i.e., a voiding urethrogram) or placement of the catheter end within the prostatic urethra may have enhanced opacification of the fistula. Chronic inflammation and fibrosis in the fistula may also have limited entry of contrast, as evidenced by no urination through the rectum until 8 years of age. Pooling of contrast in the prostatic urethra at the site of the fistula was observed on the earlier studies, however. The catheter tip was ideally placed for the prostatic urethrogram performed at the fourth visit to the VMTH-UW [Figure 3]. Proximity of the catheter end to the fistula may have provided the additional pressure needed for contrast to enter the fistula and be seen radiographically.

Prior to the onset of signs, there was no history of endoscopy of the rectum or urinary tract or catheterization of the urethra. Location of the fistula was radiographically similar to fistulas reported in four other male English bulldogs. Thus, the authors suspect that the defect was congenital, as has been suggested in the other four male English bulldogs reported with urethrorectal fistulas.<sup>13-15</sup> Also, the location of the prostatic defect noted on the first and second VMTH-UW radiographic studies matched the location of the fistula diagnosed 6.5 years later. The developmental pathogenesis of rectourethral fistula involves a persistent communication between the embryo's urogenital sinus and rectum.<sup>5,13</sup> This may arise from incomplete medial fusion of the urorectal fold<sup>13</sup> or by failure of complete separation of the cloaca by the urorectal septum.<sup>5,16,20</sup> A perforation in the rectum, leading to the formation of a fistula, may also arise from fetal *in utero* inflammatory or necrotizing disease caused by infection from *Herpesviridae* or *Streptococci spp.*, or by polymicrobial infection from obligate anaerobes (i.e., *Bacteroides spp.*, *Fusobacterium spp.*).<sup>13</sup>

Complications from this condition occur early in the neonate and can be corrected by surgery.<sup>1,3,4,6,19</sup> The occurrence of congenital rectourethral fistulas without atresia ani is also rare in humans. Reports describe human patients as experiencing chronic UTI and the passage of urine through the anus. The physical examination findings were variable in the reported canine cases. A female miniature poodle was observed to have an enlarged clitoris and a longer-than-normal distance between the anus and vulva.<sup>13</sup> One male English bulldog was reported to have a slightly ventrally elongated anal orifice.<sup>13</sup> A "key hole"-shaped anus was observed in one male miniature poodle.<sup>16</sup> Diagnosis is often difficult to achieve, requiring repeated contrast radiological studies before a definitive diagnosis can be made.<sup>21</sup> The placement of the urinary catheter tip just distal to the prostate may aid in identifying this condition when performing urethrography. Although balloon-tipped Foley catheters facilitate holding the catheter in place and prevent leakage of the distended urethra, the authors prefer to use a soft feeding-tube catheter for urethrography. Soft feeding-tube catheters allow for ease of movement within the ureter during urethrography, and a properly sized feeding-tube

catheter will not allow reflux to occur. Computed tomography (CT) can provide adequate detail for the determination of the type of surgical procedure necessary to correct the anomaly.<sup>22</sup> Meconium was present in the urine of most of the human and calf neonates in the cited cases.<sup>7,8,17</sup> The authors do not know if meconium-stained urine was observed with their patient. In each UTI involving the English bulldogs, *Proteus spp.* and *E. coli* bacteria were isolated as the causative agents.<sup>13-15</sup> It is likely the fistula allowed fecal contamination of the bladder to occur.<sup>10</sup> The possibility of a rectourethral fistula should be considered in a male English bulldog presenting with recurrent UTI. Castration of affected patients is recommended, as rectourethral fistula is likely a genetic, gender-specific defect in this breed.<sup>13</sup>

### Conclusion

The presentation of rectourethral fistula in the case of this study is similar to four previously reported English bulldogs with rectourethral fistulas.<sup>13-15</sup> This dog had a history of antibiotic-responsive, chronic recurrent UTI beginning prior to maturity. The clinical signs in all five bulldogs were similar and included UTI, dysuria, hematuria, and urine passing through the rectum.<sup>13-15</sup> The bulldog of this report is unique in that the rectal urination was not observed until 8 years of age. In the other reported cases, the onset of signs began at a few weeks of age and persisted until surgically corrected.

<sup>a</sup> Clavamox; Pfizer Animal Health, Eaton, PA

<sup>b</sup> Bactrim; Roche, Nutley, NJ

<sup>c</sup> Ciprofloxacin; Bayer Corporation, Shawnee Mission, KS

<sup>d</sup> Hypaque; Nycomed Inc., Princeton, NJ

<sup>e</sup> Flagyl; Searle, Chicago, IL

<sup>f</sup> Amoxil; SmithKlein Beecham, Eaton, PA

<sup>g</sup> Baytril; Bayer Corporation, Shawnee Mission, KS

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