CASE REPORT

Transpelvic urethrostomy in a Staffordshire bull terrier: a new technique in the dog

An eight-year-old male Staffordshire bull terrier was presented with a bleeding mass in the urethral mucosa 1.5 cm distal to the ischial arch. After cytological findings suggestive of a squamous cell carcinoma and confirmation of the mass with urethroscopy, total penile amputation followed by transpelvic urethrostomy using an ischial symphyseal ostectomy was performed. The procedure successfully produced a tension-free anastomosis of the urethra to the skin in the scrotal position and no major complications were observed in the postoperative period. Histologically, the lesion was reported as a ruptured vascular structure with thrombosis and repair tissue. Seven months after surgery the dog is free of clinical signs.

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INTRODUCTION

Permanent urethrostomy in dogs is indicated for the treatment of severe urethral trauma, stricture, obstruction or loss of the more distal urethra and following tumour resection. It is described in a penile, scrotal or perineal location with or without a concurrent penile amputation (Bjorling 2002). Scrotal urethrostomy is the preferred location, as the urethra lies relatively superficial in that area, is only covered by a thin layer of cavernous tissue, and complications are usually minimal with the appropriate surgical technique. Perineal urethrostomies are associated with more postoperative haemorrhage as the urethra lies under a thicker layer of corpus spongiosum penis and in a deeper position relative to the skin (Kyles and others 1996). To avoid undue tension between the urethra and the skin during urethrostomy closure, enough urethral length to span the distance between ischial arch and skin must be available. Should a more aggressive resection be necessary, prepubic urethrostomy has been described as a salvage procedure (Mendham 1970, Bradley 1989, Kyles and others 1996). However, complications such as urinary obstruction, urine scaling, urinary incontinence and urinary tract infections (UTIs) have been reported with this technique in the cat (Baines and others 2001); additionally, prostatic enlargement in males can complicate surgery (Kyles and others 1996).

Bernardé and Viguier (2004) published a technique for transpelvic urethrostomy in 11 male cats using an ischial ostectomy for primary treatment of urinary tract obstructions or as a salvage procedure after failed perineal urethrostomy. We adapted this technique and successfully applied it in a Staffordshire bullterrier that presented with a haemorrhaging urethral mass.

CASE HISTORY

An eight-year-old male entire Staffordshire bull terrier was referred to Davies Veterinary Specialists with a 72-hour history of penile haemorrhage. This occurred after urination and during excitement and had previously led to the development of a mild, but acute anaemia with a packed cell volume (PCV) of 26%. A catheter placed by the referring veterinary surgeon had passed freely. Treatment had consisted of sedation with acepromazine subcutaneously and amoxicillin/clavulanic acid and carprofen orally. On our initial clinical examination, the dog showed pale mucous membranes; on rectal examination, the prostate was smooth, non-painful and mildly enlarged (6 cm in diameter). Active penile haemorrhage was evident and all other clinical parameters were within normal limits. An abdominal ultrasound scan revealed the presence of hypoechoic contents in the urinary bladder suggestive of blood clots or sediment and mild and uniform prostatic enlargement with homogenous prostatic tissue. An ultrasound-guided core biopsy of the prostate confirmed benign prostatic hyperplasia. Seven months after surgery the dog is free of clinical signs.

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a 10 mm filling defect was evident within the urethra approximately 1.5 cm distal to the ischial arch (Fig 1). A 10-F urinary catheter was advanced into the urethra and traumatic aspiration biopsies were taken from the prostatic, ischial and penile urethra under ultrasound guidance. Cytology results were suggestive of the presence of a squamous cell carcinoma associated with mild neutrophilic urethritis at the penile and ischiatic aspiration site (Fig 2). The dog was treated with sedation using 0.01 mg/kg of acepromazine (ACP 2 mg/ml, Novartis) and 0.2 mg/kg butorphanol (Torbegesic 10 mg/ml, Fort Dodge Animal Health) to minimise excitement; anti-inflammatory treatment was changed to meloxicam (Metacam, Boehringer-Ingelheim), while laboratory results were pending. Clinical signs improved for 3 days but profuse haemorrhage resumed on day 4. The smooth urethral outline on the cystourethrogram did not seem to be consistent with urethral squamous cell carcinoma, and it was decided to perform normograde cystourethroscopy to confirm the radiographic findings and evaluate the urethral mucosal lining. The possibility for a re-biopsy and histopathological evaluation of the sample was discussed with the owners; however, because of the continuous profuse haemorrhage, they opted for a definitive surgical solution should it be possible. The dog was anaesthetised and received an iv injection of 20 mg/kg amoxicillin/clavulanic acid (Augmentin, Glaxo Smith Kline) at the time of induction. In dorsal recumbency, a 3 cm caudal coeliotomy was performed, and via a 1 cm cystotomy, a 4 mm flexible endoscope was introduced into the bladder lumen and passed into the urethra. A 7 mm, reddish-brown round raised mucosal lesion was identified in the urethra just distal to the ischiatic arch. A cystostomy tube (Foley catheter, 8 F, Smith Medical) was placed and the incisions in the bladder and abdominal wall were closed in a routine fashion.

Subsequently, a total penile amputation was performed by initially incising elliptically around the prepuce and scrotum followed by castration. The penis was reflected caudally and the ischiocavernosus and ischiourethralis muscles were transected close to their origin at the ischial arch. The pelvic symphysis was denuded by elevation of the adductor, gracilis and parts of the external obturator muscles and a bone segment 2 cm long and 1.5 cm wide removed from the ischial symphysis using a pneumatic burr and rongeurs (Fig 3). The dorsal penile and bulbous veins and penile artery were ligated and transected, the retractor penis muscle was transected and the remaining penile attachments

FIG 1. Retrograde urethrocystogram showing a smooth urethral filling defect approximately 1.5 cm distal to the ischial arch

FIG 2. Ischial urethral mucosa via traumatic catheterisation: sheet of uroepithelial cells showing cellular crowding and nuclear moulding, with moderate anisokaryosis and anisocytosis, cells having an oval irregularly thickened nuclear membrane around coarsely stippled to slightly reticular chromatin and variable sized, single to multiple, nucleoli. Their cytoplasm is polygonal and moderately basophilic with occasional indiscrete perinuclear vacuolations. Rare mitotic figures, variable keratinisation and neutrophils are not shown in this photo (May Grunwald Giemsa. ×1000)
freed from the ischium. The penis was removed by transecting the urethra immediately proximal to the bulbospongious muscle leaving 0.5 cm of urethra intact distal to the ischial arch to facilitate tension-free closure (Fig 4). The urethra was catheterised, elevated to the skin and spatulated ventrally. The urethral mucosa was sutured to the skin using simple interrupted 2-metric (3/0 USP) polypropylene sutures (Prolene, Ethicon). The remaining wound was closed in a routine fashion. The resected penis and urethra were submitted for histopathology, which indicated an injured vascular structure with thrombosis, haemorrhage and repair tissue; no neoplastic cells were found (Fig 5).

The dog made an uneventful recovery from anaesthesia and surgery. He was continent and able to urinate through the urethral stoma immediately following surgery. Mild bruising and urine soiling of the surrounding skin was present for 10 days following surgery and urine scald was prevented by strict hygiene and the application of petroleum jelly (Vaseline cream, Unilever). Furthermore, he received a 5-day course of amoxicillin/clavulanic acid (Synulox, Pfizer) and meloxicam (Metacam, Boehringer-Ingelheim). Sutures were removed on day 14 at which stage there was no evidence of stricture (Fig 6). On a telephone interview seven months after surgery, the dog is clinically normal, he is continent, not dysuric, no urine soiling is present and his urination behaviour is unaltered compared with his preoperative urination behaviour. The owners are very satisfied with the outcome.

**DISCUSSION**

Urethrostomies for the treatment of urethral pathologies are described in the prescrotal, scrotal, perineal or prepubic area, depending on nature and location of the lesion. In our case, the location of a lesion 1.5 cm distal to the ischial arch required an urethrostomy location proximal to the perineal area. With total penile amputation and subsequent transpelvic urethrostomy, the intrapelvic urethra could be elevated and apposed to the skin without undue tension. Mild urine soiling was present for 10 days; this was treated with strict hygiene of the inner thighs and application of petroleum jelly.

Haemorrhage is common after prescrotal, scrotal and perineal urethrostomies with 72% of dogs reported to bleed for an average of 4.2 days after scrotal urethrostomies (Bilberry and others 1991). Our dog did not develop haemorrhage after surgery, most likely because all erectile tissues including the corpora cavernosum and spongiosum penis were removed during the procedure.
All urethroscopy techniques predispose the patient to the development of UTIs due to loss of urethral length and 15% of dogs with scrotal urethrostomies are reported to develop UTIs (Bilberry and others 1991). The risk for UTI after perineal urethrostomies is especially high because of the close proximity of the stoma site to the anus and potential contamination with faeces (Bergmeister 1986). With the transpelvic technique, the stoma site is in a more favourable location just caudal to the ischial arch. This might have contributed to the lack of evident UTI in our dog. However, urethral length is still significantly shortened, and it has been shown that UTI can be present even without clinical evidence (Ling 1995, Forrester and others 1999), so long-term monitoring for UTI including bacteriological examination of a cystocentesis sample is advisable in dogs following this procedure.

Urinary incontinence is reported to be a problem following prepubic urethrostomies: Mendham (1970) reported 9% of cats permanently incontinent. Bradley (1989) reported normal urinary function in two dogs and seven cats with prepubic urethrostomies; however, the time after surgery at which this was achieved was not reported in that study. In the most recent study of Baines and others (2001), 6 of 16 cats were permanently incontinent after the procedure. Our dog was continent immediately after surgery, and we believe that sufficient urethral length was preserved to maintain urinary continence. Additionally, no excessive dissection was necessary dorsal to the pelvic urethra that could potentially damage urethral nerve supply.

Stricture formation is rarely reported after urethrostomies in dogs and is mainly a problem if tension is created at the stoma site (Kyles and others 1996). In cats, stricture formation is usually secondary to an inadequately sized perineal urethrostomy or to a stoma creation in the penile urethra rather than in the wider pelvic urethra. Bernardé and Viguier (2004) reported resection of subcutaneous fat before suture placement in 2 of the 11 cats with transpelvic urethrostomy to reduce tension on the suture line. In our Staffordshire bull terrier, the large muscle mass resulted in a stoma that lies relatively deep to the skin. However, preservation of 0.5 cm of penile urethra facilitated tension-free closure. No stricture formation was evident at the time of suture removal and at the seven-month telephone conversation, the owners do not report any sign of urinary obstruction.

Cytological results were suggestive of a squamous cell carcinoma with a concurrent pyogranulomatous urethritis. In the light of difficulty to distinguish neoplastic versus inflammatory cells cytologically, a re-biopsy of the lesion for histopathology was considered. However, clinical signs of profuse haemorrhage refractory to hypotensive and anti-inflammatory treatment with acepromazine and meloxicam,
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respectively, and the cytological findings
together with the confirmation of a lesion
during antegrade urethroscopy led to the
decision for surgery. The cytological find-
ings were not confirmed on histopathol-
ogy which showed a ruptured vascular
structure with thrombosis, haemorrhage
and repair tissue.

Expansion of the mass due to blood
perfusion \textit{in vivo} might explain the size
discrepancy seen between the lesion on
the retrograde urethrocystogram (Fig 1)
and the resected tissue (Fig 5). In con-
clusion, the dog reported had a haemor-
rhagic mucosal lesion 1.5 cm distal to the
ischial arch. A squamous cell carcinoma
was suspected from preoperative catheter
suction aspirations. The novel technique of
transpelvic urethrostomy was successfully
performed and led to an excellent clinical
outcome. Postoperatively, mild bruising
and urine soiling was present for 10 days,
no other complications were observed.
However, larger case numbers are neces-
sary to fully explore complications of the
transpelvic urethrostomy technique in
dogs. The promising results in our dog
may encourage surgeons to consider this
technique in the dog as a salvage proce-
dure in selected cases of proximal urethral
lesions.

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