A case of penis amputation and scrotal urethrostomy

Author: Kate Parkinson

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ABSTRACT

Penis amputation and scrotal urethrostomy in a dog is indicated for several conditions, including severe wounds of the distal penile shaft. Hair ligatures are a common cause of penile injury and should be ruled out in all cases of penile prolapse and paraphimosis.

The author found the surgery challenging, but suitable for colleagues comfortable with their soft tissue handling skills. A scrotal urethrostomy is the preferred site. Scrotal ablation is advised and aggressive pain relief during and after surgery is indicated. A round-bodied needle is recommended for suture of the urethral stoma to the skin. Fashioning the stoma was the most technically demanding part of the procedure.

Veterinary surgeons should discuss complications and postoperative expectations with owners, including the possibility of postoperative haemorrhage and the potential requirement of a lengthy postoperative period. The patient’s temperament is an important consideration.

A five-year-old castrated male retriever-type dog with suspected penile prolapse presented to the clinic as an emergency, following a three-hour mounting session with a long-coated bitch.
The owners reported the dog seemed unable to retract his penis into its sheath, he was in pain and was attempting to urinate, but seemed incapable of passing urine.

The patient was ambulatory on admission, with a prolapsed, discoloured and tumescent penis. No initial sign of penile trauma was apparent. Following application of a commercial lubricant and lavage with a hypertonic sugar solution, the penis rapidly became flaccid. However, the patient was still unable to pass urine and the penis remained extruded from the prepuce.

Following a more detailed examination, a constricting hair ligature was found encircling the penis just distal to the bulbus glandis. A dose of medetomidine (10µg/kg IV) and butorphanol (0.2mg/kg IV) resulted in good sedation. The ligature was removed gently with scissors. Following ligature removal, 1L of concentrated urine was removed from the bladder via catheterisation.

The penis was lubricated and replaced within the prepuce. A purse-string suture was placed around the preputial opening to prevent further prolapse before sedation was reversed using atipamezole.

IV lactated Ringer’s solution was provided at 5ml/kg/hr via the cephalic vein. Pain relief (meloxicam 0.1mg/kg by mouth once daily) and broad-spectrum antibiotic treatment (amoxicillin/clavulanate 12.5mg/kg by mouth twice daily) were instituted. An Elizabethan collar was applied to prevent injury to the penis.

**Hair rings**

Hair rings have been documented as a cause of reproductive injury in cats, bulls, chinchillas and humans, as well as other food-producing animals. Although our patient had been castrated by
another vet several years prior to presentation, this had not prevented a prolonged period of mounting. This is not unusual, even in castrated male dogs, as behavioural responses to castration may vary.

**Indication for penile amputation**

![Figure 2. Necrotic penis protruding from prepuce.](image)

The purse-string suture was removed 24 hours after presentation and the penis was examined (Figure 1). The patient was passing urine normally by this time. However, the penis was mildly prolapsed (Figure 2) and the shaft of the penis distal to the ligature was discoloured. Twice-daily lubrication was instituted, and pain relief and broad-spectrum antibiotic cover was continued. The prognosis appeared guarded and the potential for penile amputation was discussed with the owners at this stage.

At 48 hours after presentation, the shaft distal to the ligature had become necrotic. The dog was bright, urinating, eating and comfortable. Due to the advanced stage of the necrosis, it was clear a salvage procedure, such as amputation followed by urethrostomy, was the only remaining surgical option. The author researched surgical techniques with the help of *Small Animal Surgery* and the Veterinary Information Network website.

**Surgery preparation**

Unfortunately, referral of the case was not an option due to financial concerns. At first, the patient’s owners were reluctant to consider amputation due to fear of an unacceptable cosmetic outcome, and euthanasia was discussed at this time. Following a conversation, which included photographs of similar cases and discussion of potential complications, surgery was scheduled for the following day.
At 72 hours after presentation, the distal portion of the penile shaft sloughed and the dog consumed the portion of necrotic tissue en route to the main clinic, despite the use of an Elizabethan collar.

A premedication of acepromazine (0.01mg/kg) and morphine (0.1mg/kg; used under the cascade) was administered IM and general anaesthesia was induced by IV propofol given to effect. Following intubation, anaesthesia was maintained with isoflurane. A urinary catheter was inserted and the patient’s bladder was drained prior to surgery. The urethral opening was difficult to locate due to the advanced state of necrosis, and placement of the urinary catheter aided intraoperative location of the urethra prior to scrotal urethrostomy. A constant rate IV infusion of morphine and ketamine was used during surgery and continued until 24 hours after surgery.

**Surgical technique**

An elliptical incision was made around the genitalia and the penis was dissected carefully from the abdominal wall. The preputial and caudal superficial epigastric vessels were carefully ligated with 3-0 polydioxanone suture material. The penis was dissected from the body in a caudal direction.

The dorsal penile vessels were identified and ligated and the penis was separated from the abdominal wall just caudal to the os penis. A tourniquet was used just proximally to the urethrostomy site during the early stages of surgery. This proved invaluable in reducing intraoperative haemorrhage. As the patient retained a small scrotum, despite castration, a scrotal ablation was performed.

To create the urethrostomy opening, the urethral mucosa was incised over the indwelling catheter. The incision was about 3cm in length. An incision length of 2cm to 4cm is recommended to ensure sufficient lumen size after healing is complete. The urethral mucosa was flared and sutured to the skin with a simple interrupted pattern of 5-0 polydioxanone suture. This was the most technically demanding stage of the surgery.

The skin was closed using a simple interrupted pattern of 3-0 polyglactin 910 suture. Simple continuous closure patterns have also been described. A swaged reverse cutting needle was used to place the sutures, beginning at each corner of the flared urethra before suturing around the edges of the stoma. The incised edges of the corpus cavernosum were incorporated into the suture using a “sandwich” technique, in the hope this method would reduce postoperative bleeding. No additional haemostasis was required.

**Urethrostomy site**
Several urethrostomy locations are possible in small animals. Preputial urethrostomy was deemed inappropriate in this case, due to the proximal location of the injury. This procedure, when feasible, is desirable as the dog can still urinate through the prepuce – reducing the risk of skin irritation or urine scalding in the postoperative period\textsuperscript{10}.

Transpelvic urethrostomy using an ischial ostectomy has been performed by specialist surgeons with good results\textsuperscript{11}. However, this radical approach was not a treatment the author was familiar with or comfortable performing.

Scrotal or perineal urethrostomy in the dog is a widely recognised and well-documented procedure, associated with good surgical outcomes. A caudally positioned stoma ensures urine is voided straight down the perineal urethra. Careful assessment of the site and excision of any remaining scrotal folds is necessary to prevent postoperative urine scalding. This option was chosen by the author due to the ease of the procedure and high chance of a successful postoperative outcome (Figure 3).

**Postoperative care**

An Elizabethan collar was used post-surgery to prevent licking. The patient’s inguinal region and inner thighs were clipped short to prevent urine staining (Figure 4) and zinc barrier cream was used generously in this region to prevent urine scald. Petroleum jelly is a good alternative due to the risk of zinc toxicity\textsuperscript{12} if large quantities of zinc cream are consumed.

Bandages were applied to both hindfeet for several days post-surgery to prevent traumatic damage. Broad-spectrum antibiotic cover was continued until five days postoperatively. The patient was exercised on flat ground only for two weeks following his operation to encourage a squatting.
position while urinating. Exercise was strictly limited to short lead walks only. The sutures were dissolvable.

**Pain relief**

A constant rate IV infusion of morphine (0.25mg/kg/hr) and ketamine (0.8mg/kg/hr) was used intraoperatively and continued until 24 hours post-surgery. Maropitant (1mg/kg SQ once daily) was administered in the initial postoperative procedure to provide additional visceral pain relief. NSAIDs (meloxicam 0.1mg/kg by mouth once daily) were administered for several days following the procedure.

**Complications**

Figure 4. Patient two days after surgery.

The patient experienced some moderate post-surgical haemorrhage when urinating. This haemorrhage continued for 14 days post-surgery. This is a recognised complication and may have been marginally exacerbated with the use of a reverse cutting needle to suture the urethrostomy site.

For this reason, round-bodied needles are preferred if available. The haemorrhage was not clinically significant, although it was sufficiently dramatic that the dog was hospitalised for the full 14 days. This should be taken into account when calculating presurgical estimates and managing owner expectations.

Due to the potential for postoperative and intraoperative haemorrhage, penis amputation and scrotal urethrostomy would not be recommended in patients with coagulation defects. Excitement in some dogs can also lead to excessive haemorrhage from the urethrostomy site and sedation.
may be necessary to control the bleeding in these cases.

Complications associated with penile amputation and scrotal urethrostomy were evaluated in a small study\textsuperscript{13}. A total of 18 dogs were evaluated following surgery. All 18 dogs experienced some postoperative bleeding for up to 21 days following surgery.

Four dogs (22.2\%) experienced minor post-surgical complications at suture removal, including haemorrhage at the site of suture removal, postoperative bruising and swelling, and granulation of the edge of the surgical site.

One dog experienced a major postoperative complication when post-surgical dehiscence caused a stricture of the stoma. All dogs with non-neoplastic diseases had excellent long-term outcomes.

A retrospective study of 38 dogs with scrotal urethrostomies\textsuperscript{14} found 26 of 36 dogs (72.2\%) enrolled in the study experienced similar post-surgical bleeding. Mean duration of postoperative bleeding in the study population was of much shorter duration (3.1 days), indicating the length of postoperative bleeding is reduced if urethrostomy is performed without penile amputation.

Urine scalding is another potential complication of this surgery. Excision of all redundant skin is crucial. A caudally positioned perineal or scrotal urethrostomy is less likely to cause scald as the urine is voided straight down the pelvic urethra.

Squatting to urinate should be encouraged as this urination posture is less likely to cause contamination of the inguinal region with urine. Urination should be closely monitored, good hygiene observed and barrier cream used when necessary.

Stricture of the urethrostomy site is associated with incisional dehiscence. Dehiscence should be repaired without tension if required. One advantage of a scrotal urethrostomy is a subsequent perineal urethrostomy can be performed if needed.

**Temperament**

The patient experienced no other postoperative complications and coped well with the long postoperative hospitalisation period. He was a very relaxed dog with an exceptionally good temperament.

Aggressive animals would be much more difficult to manage postoperatively and this must be taken into account when planning surgery and postoperative care.

**Outcome**

Long-term outcome was excellent. Three months following surgery, the urethrostomy site had
healed well and the patient was able to pass urine easily, although his coat had to be kept clipped short to prevent scald. His owners were pleased with the outcome.

**Conclusion**

In conclusion, this was an interesting surgery well within the abilities of the average general practitioner. The author found the surgery of comparable difficulty to a mammary strip or mature spay in a large breed dog.

A scrotal urethrostomy is generally preferred to prevent urine scald and a urethral incision of at least 2cm is recommended to prevent stricture formation at the stoma. A round-bodied needle is recommended when placing sutures between the skin and urethral mucosa.

Aggressive pain relief is necessary in the initial postoperative period and some haemorrhage is to be expected. As with all surgeries, the importance of managing the client’s expectations, as well as excellent communication, cannot be overestimated. A prolonged postoperative period of hospitalisation may be required. For this reason, patients of good temperament are better suited to this procedure than aggressive or nervous dogs, whose natural tendencies may be exacerbated by fear, pain and anxiety resulting from a change in their daily routine.

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**References**

7. [www.vin.com](http://www.vin.com)


Further Reading