Use of an incontinent end-on colostomy in a dog with annular rectal adenocarcinoma

An 11-year-old, mixed-breed dog with dyschezia, tenesmus and haematochezia was presented. A rectal stricture caused by an adenocarcinoma was diagnosed. Following the failure of a rectal ‘pull-through’ procedure, which dehisced seven days later, an incontinent end-on colostomy was performed, allowing amputation of the colorectum with the anus and perineal skin. A two-piece device consisting of a flange and a drainable pouch was used for postoperative faecal evacuation and collection. Mild peristomal dermatitis was the only complication. Patient management was easily carried out by the owner at home, and the dog survived for four months with a satisfactory quality of life. Incontinent end-on colostomy may prove to be a useful treatment for canine annular colorectal tumours.

INTRODUCTION

Colorectal adenocarcinoma is a rare tumour in dogs. In most cases, the tumour is pedunculated or polypoid and the postoperative prognosis is fairly good (Holt and Lucke 1985, Church and others 1987). Dogs with annular colorectal adenocarcinomas have a poor prognosis (Holt and Lucke 1985, Church and others 1987, Prater and others 2000). Most reported cases were euthanased following persisting clinical signs of dyschezia and haematochezia.
An 11-year-old, mixed-breed male dog, weighing 11.9 kg, was presented to the authors' hospital with dyschezia, tenesmus and haematochezia. On first presentation, rectal palpation revealed an annular stricture about 5 cm from the anus. No other significant abnormalities were present on physical examination, which included a complete blood count and biochemical profiles.

Contrast radiography revealed narrowing of the rectal lumen, but no compression from the surrounding tissues was detected (Fig 1). Radiographic examination revealed neither enlargement of the iliac lymph nodes nor nodular lesions in the lung suggestive of metastasis. Endoscopic evaluation revealed mild to moderate inflammation of the mucous membrane at the site of the rectal stricture. Computed tomography showed that the rectal stricture was due to annular thickening of the intestinal wall (Fig 2). Rectal neoplasia was suspected.

**Surgical procedures**

**Procedure 1**
Rectal pull-through was performed to remove the rectal stricture, relieve the clinical signs and to obtain a pathological diagnosis. The dog was premedicated with atropine sulphate (0·05 mg/kg subcutaneously) and diazepam (0·5 mg/kg intravenously [IV]). Anaesthesia was induced with thiamyl sodium (10 mg/kg IV) and maintained with isoflurane after intubation. A full-thickness 360° incision of the rectum was made, leaving 1 cm of rectal wall attached to the anus. The rectum was pulled out by bluntly dissecting along the external wall, and the lesion was transected with 2 cm margins of macroscopically normal cranial rectum. Microscopically, neoplastic proliferation of epithelial cells was observed, with prominent invasion of the surrounding tissue. The rectal thickening was histopathologically diagnosed as an adenocarcinoma and the surgical margin was incomplete.

The patient's tenesmus and haematochezia did not improve postoperatively and stricture and dehiscence were found at the site of surgery within a week. The lesion was again biopsied and the specimen was histopathologically diagnosed as a recurrence of the neoplasm with invasion of the surrounding perianal skin.

**Procedure 2**
In the second surgical procedure, the colon-rectum was amputated with a wide resection of perianal skin, and a paralumbar end-on colostomy was performed. Anaesthesia was as described for the first surgery. The dog was placed in right lateral recumbency and a circular incision was made in the skin on a relatively flat area of the left paralumbar region, just above the centre of a line connecting the costochondral junction of the last rib and the ilium. The incision was extended through the abdominal wall. After repositioning the dog in dorsal recumbency, a caudal midline laparotomy was performed. The colon was transected just proximal to the pubis. Both ends of the colon were temporarily oversewn and the proximal end was passed through the paralumbar aperture and exteriorised from the abdomen. The circumference of the serosal surface of the colon was sutured to the abdominal musculature with 3-0 polyglyconate suture (Maxon; United States Surgical) in a simple interrupted pattern. A stoma was formed by suturing the full thickness of the
evaginated colon to the skin of the circular aperture with 3-0 polyglyconate in a simple interrupted pattern (Fig 3).

The abdomen was temporarily closed by suturing the abdominal wall and skin in a continuous pattern with silk. After repositioning the dog in ventral recumbency, an extensive area of the perianal skin with underlying muscle was dissected free and the distal colorectum including the anus was pulled out from the pelvic cavity. After complete closure of the perianal wound, the dog was again positioned in dorsal recumbency and, after lavaging with warm saline, the abdomen was closed in a routine fashion.

Postoperatively, antibiotics (enrofloxacin 50 mg [Baytril; Bayer] twice daily subcutaneously) were given for two weeks, but analgesia was not needed. For the management of the colostomy, a two-piece appliance (Varicare Natura; Convatec) (Fig 4) was attached to the dog to allow faecal evacuation and collection. For attachment of the appliance, the dog was placed in right lateral recumbency, the stoma and surrounding skin were cleansed with 1 percent chlorhexidine gluconate, and the haircoat was clipped. Having checked the diameter of the stoma, an adhesive flange (Varicare Natura Flange; Convatec) was cut to the appropriate size, and stoma adhesive paste (Varicare Paste; Convatec) was applied around the inner opening. The flange was then positioned with the stoma in the centre of the opening and held down to allow a firm adhesion to the skin (Fig 5); tape was applied to the flange to reinforce adhesion. Finally, the pouch (Varicare Natura Drainable Pouch; Convatec) was attached. This colostomy procedure was initially performed twice daily.

**Postoperative recovery and outcome**

The dog was hospitalised for two weeks. On discharge, after suture removal, the owner was instructed in the daily maintenance of the colostomy. The pouches were changed twice daily when filled with faeces, a procedure which took only a few minutes. Flanges were changed two or three times a week, generally when they were non-adherent or when faecal soiling was evident between the skin and flange. The time taken to perform flange maintenance was about 20 minutes. Skin irritation was treated with local antibiotics and corticosteroids (Rinderon-VG; Shionogi) when any dermatitis was observed.

The dog was given 5 ml of lactulose orally twice daily to prevent constipation. Adjunctive chemotherapy included carboplatin (Paraplatin; Bristol Pharmaceuticals) at a dosage of 300 mg/m² once monthly for two treatments. The dog was evaluated in the hospital every one or two weeks to check the adequacy of colostomy maintenance, and to monitor for dermatitis, metastasis or recurrence of the tumour. The dog's bodyweight was maintained and it could move and exercise normally. The stoma did not appear to cause the dog any annoyance and thus neither an Elizabethan collar nor a muzzle was required to prevent biting or licking of the site. However, for cosmetic reasons, the owner made a jacket for the dog which covered the whole trunk and the pouch, and this turned out to be useful in securing the pouch against the body.

Recurrence of the tumour in the perineal skin three months after the second procedure was confirmed by fine needle aspiration. Metastasis to the inguinal lymph node was also confirmed by fine needle aspiration. Following recurrence, a single dose (20 mg/m²) of doxorubicin (Adriacin; Kyowa Hakko Kogyo) was injected, but was ineffective. Thereafter, only symptomatic treatments were carried out, such as diuresis (furosemide [Lasix; Hoechst] 20 mg twice daily orally) to alleviate oedema, antibiotics (enrofloxacin [Baytril; Bayer] 50 mg twice daily orally) to prevent infection, fluid therapy for dehydration, and alminoprost (Minalfen; Fujirebio, 100 mg twice daily orally) and butorphanol tartrate (Stadol; Bristol Pharmaceuticals, 1 mg intramuscularly when needed) as analgesia. The dog died 121 days after construction of the stoma (194 days after first presentation).

**DISCUSSION**

Colostomy is not frequently attempted by veterinary surgeons as a treatment for colorectal disease, presumably because of diffi-
Use of an incontinent end-on colostomy (Corman 1998) reported a method of managing a diverting loop colostomy in five dogs with rectal disease, it appears that, in humans, loop colostomy prolapses more frequently than end-on colostomy (Corman 1998). Thus, an end-on colostomy may be selected when the distal segment of colon need not be retained.

In the present case, the authors performed an end-on colostomy and a pro-lapse did not occur. The selection of a site free of skin folds is vital to obtain adhesion, albeit the human flange adheres poorly to canine skin. The location of the stoma is important. The flank was the site of choice, as it offers a large flat area of skin from which to construct the stoma. Further, the paste in the present case usefully filled the space between stoma and flange to minimise the amount of exposed skin. No other complications other than a mild dermatitis were observed. As the skin irritation was correctly treated, the stoma itself did not annoy the dog. The colostomy worked well and it maintained an adequate quality of life for the dog for several months.

The continent colostomy is an alternative technique, which has been reported previously in dogs (Kock and others 1974, Kosorok 1995, Williams and others 1999). This technique (with no pouch attached) requires the daily removal of faeces that are liquefied with enema solutions. Maintenance is therefore very difficult in terms of home management. Conversely, although the incontinent colostomy requires more frequent changes of the flange than does the continent colostomy (Williams and others 1999), the daily home procedures are very easy.

Canine intestinal adenocarcinomas have been grossly classified into pedunculated, having two nodular masses, more than two nodular masses, annular or intra-luminal masses, and the prognosis differs for each type (Church and others 1987, Prater and others 2000). The annular type has the worst prognosis, with a mean survival period of 1-6 months; in most reported cases, the patients were euthanased due to severe clinical signs. Several treatment approaches have been reported for rectal adenocarcinoma, including cryosurgery, radical excision, chemotherapy, radiotherapy, electrocoagulation and simple palliative therapy with stool softeners (Couto 1992, Phillips 2001). One dog with a rectal adenocarcinoma underwent flank colostomy and attachment of a bag, but survived only seven days before developing perforation following leakage (Hardie and Gilson 1997). In the present case, the end-on colostomy made it possible to resect the rectum with a large margin around the anus, and the clinical signs such as haematochezia, dyschezia and tenesmus were eliminated. Furthermore, the procedure extended the survival period.

Effective chemotherapy of colorectal adenocarcinoma of dogs has not been reported in detail (Church and others 1987, Phillips 2001). In the present case, carboplatin and doxorubicin were used as adjunctive therapies. These therapeutic agents have been effective against various types of tumours (Morrison 1998, Phillips 2001). Although the tumour showed no recurrence for three months, the efficacy of the chemotherapy is not clear. Adjunctive therapy for rectal adenocarcinoma of the dog is an area requiring further study.

Conclusions

The present report describes the techniques for performing and maintaining an incontinent end-on colostomy in a dog with annular rectal adenocarcinoma. The management of the colostomy was easily carried out by the owner, and this treatment contributed to preserving the dog's quality of life. The incontinent end-on colostomy is a technique to consider when the distal bowel must be resected. The present report may positively influence owners' and veterinarians' willingness to select incontinent end-on colostomy for the management of dogs with colorectal neoplasia, trauma and stricture.

References


