Surgical Excision of Primary Canine Rectal Tumors by an Anal Approach in Twenty-Three Dogs

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Objective—To describe an anal approach for excision of primary rectal tumors in dogs and to report outcome.

Study Design—Retrospective study.

Animals—Dogs (n = 23) with primary rectal tumors.

Methods—Review of medical records (1990–2000) of dogs with primary rectal neoplasia excised surgically using an anal approach with rectal prolapse. With dogs anesthetized, the rectum was prolapsed, stabilized with stay sutures during tumor excision with 1 cm margins to the level of the muscularis, then the rectal mucosa was sutured.

Results—Each dog had only 1 tumor type (adenocarcinoma [8], solitary polyp [5], carcinoma [4], plasmacytoma [2], adenoma [1], leiomyoma [1], mucinous carcinoma [1], and papilloma [1]). Mean tumor volume was 3.1 cm³ (range 0.1–37.7 cm³). Postoperative complications (rectal bleeding [5], tenesmus [4]) were mild and resolved within 7 days after surgery; another dog had partial mucosal dehiscence identified at 6 days. The primary tumor was incompletely excised in 1 dog (4.3%), and local recurrence occurred 16 and 24 months after surgery in 2 dogs. Outcome beyond the immediate postoperative period was known for 18 dogs, including 2 dogs still alive. Mean postoperative disease-free interval for these 18 dogs was 36.8 months (range 5–84 months).

Conclusion—Surgical excision of tumors of the caudal rectum can be accomplished through the anus after rectal prolapse.

Clinical Relevance—An anal approach facilitated by rectal prolapse should be considered as a viable option for the surgical treatment of selected cases of tumors of the caudal aspect of the rectum in dogs.

INTRODUCTION

PRIMARY CANINE RECTAL tumors are an uncommon but clinically important disease.1–4 Reports of occurrence of canine rectal tumors are sparse, but ~50% are reportedly malignant, with adenocarcinoma being most prevalent.5 Other malignancies affecting the canine rectum include leiomyosarcoma, lymphosarcoma, and hemangiosarcoma.5,6 Benign neoplasms such as adenoma, fibroma, and leiomyoma also occur; however, in 1% report, 50% of benign adenomatous polypoid lesions had histologic evidence of malignant transformation within specimens, ranging from villous or adenomatous cells to highly dysplastic carcinoma cells.7 Whereas identification of malignant elements within cells of canine tumors classified as benign has been reported,7–9 this phenomenon is not well understood. In humans, however, observation of cellular transition to a malignant phenotype is considered indicative of increased potential for malignancy.6–8 Little has been reported about primary rectal neoplasia in the dog or outcome after surgical excision. Surgery of the rectum can be challenging because of the regional anatomy; however, an anal approach with rectal prolapse...
has been described for resection of rectal masses located caudal to the pelvic inlet. Our purpose was to retrospectively determine the clinical course, histologic findings, and results of surgical excision of primary rectal masses using an anal approach facilitated by rectal prolapse.

**MATERIALS AND METHODS**

**Criteria for Inclusion**

Medical records of dogs with primary rectal masses examined between 1990 and 2000 were identified and reviewed. Primary rectal neoplasia was defined as presence of a rectal tumor without identification of other primary tumors. Only dogs with rectal neoplasia, confirmed histologically, and treated by surgical excision by an anal approach facilitated by rectal prolapse were included.

**Data Retrieved**

Data collected was signalment, history, clinical signs, results of physical examination (including location and size of the tumor), results of other diagnostic tests, description of surgical excision, histologic findings, survival, and evidence of recurrence. Tumor volume was estimated from three-dimensional measurements. Recurrence was confirmed histologically. Outcome was obtained for all patients until death, loss to follow-up, or until the preparation of this report by either hospital examination or telephone contact with owners and referring veterinarians.

**Surgical Procedure**

Preoperative preparation consisted of no special preparation (n = 11), enemas (7), or oral osmotic drugs (2), and 3 dogs were administered enemas and oral osmotics. Preinduction analgesia included administration of either morphine (0.5–1.0 mg/kg subcutaneously [SQ] or intramuscularly [IM]), or hydromorphone (0.1–0.2 mg/kg SQ or IM). Opioids were administered postoperatively as needed to control pain. Anesthesia was induced with either thiopental (10–20 mg/kg intravenously [IV]) or propofol (4 mg/kg IV), and maintained with either isoflurane or sevoflurane in oxygen.

Atraumatic forceps were used to grasp the rectal mucosa, and the mass and adjacent rectum were prolapsed caudally through the anus. Caudal retraction and exteriorization of the mass was maintained by stay sutures placed through the mucosa and submucosa of the rectum cranial to the mass or by similar placement of Babcock forceps. In all dogs, the mass was resected to the level of the muscularis including at least a 1 cm margin of grossly normal adjacent rectal tissue. The rectal defect was closed with 2.0 or 3.0 polygactin 910 in a single layer, simple continuous pattern. In 1 dog, the mass was excised in stages by incising and suturing in succession until the lesion was removed and wound closure completed. After tissue excision and wound closure, the rectum was reduced into the pelvic canal. Excised tissue was submitted for histopathologic examination.

**RESULTS**

Records for 23 dogs (4 intact and 10 neutered males, 3 intact and 6 neutered females) that met the inclusion criteria were reviewed. Breeds distribution was German Shepherd (5), mixed breed (4), Doberman Pinscher (2), and Airedale Terrier, Beagle, Brittany Spaniel, Boxer, Golden Retriever, Great Dane, Keeshond, Labrador Retriever, Miniature Poodle, Rhodesian Ridgeback, Scottish Terrier, and St. Bernard (1 each). Mean age at diagnosis was 8 years (range, 2–13 years). Initial clinical signs included rectal bleeding (16% dogs, 70%) tissue protrusion from the anus (8; 36%), tenesmus (8), and diarrhea (1). Mean duration of clinical signs before examination was 30 weeks (range, 0–156 weeks).

All tumors were identified by digital rectal examination. Mean estimated tumor volume was 3.1 cm³ (range, 0.1–37.7 cm³; Table 1). Sublumbar lymph nodes were evaluated for enlargement by abdominal radiography (4 dogs) and ultrasonography (10 dogs). Abdominal radiographs in 1 dog revealed an enlarged soft tissue opacity in the sublumbar region, but abdominal ultrasonography was not performed and abdominal metastasis was not confirmed. Metastasis to the sublumbar lymph nodes was not identified by ultrasonography, surgery, or necropsy in any dog.

Rectal tumors were polypoid in 6 dogs. Only 1 tumor type was identified in each dog. Histologic diagnoses were adenocarcinoma (8), solitary polyt (5), carcinoma (4), plasmacytoma (2), adenoma (1), leiomyoma (1), mucinous carcinoma (1), and papilloma (1). All tumors were excised by an anal approach with rectal prolapse. Psyllium fiber (Metamucil, Proctor & Gamble Co., Cincinnati, OH) was administered to 2 dogs (typically, 3 tablespoons in food once daily for 2–3 weeks after surgery).

Complications occurred in 10 dogs (Table 1). In 9 dogs, signs associated with rectal bleeding (5) and mild tenesmus (4) resolved within 7 days after surgery; bleeding and tenesmus occurred concurrently in 3 dogs. Dogs were re-evaluated by digital rectal palpation only if clinical signs persisted. During re-evaluation of 1 dog 6 days after surgery, it was observed that part of the wound closure appeared to be healing by second intention, suggestive of dehiscence; no further treatment was performed. Wound infection, rectal stricture, and fecal incontinence were not observed.

All dogs had surgical resection of their primary rectal mass. Distance of the mass cranial from the anal sphincter, reported for 10 dogs, was 2.5 cm (range, 1–5 cm). Only 1 (4.3%) dog had histologic evidence of incomplete excision of a mucinous carcinoma at its aboral margin. This dog was euthanatized for unrelated reasons after a disease-free interval of 38 months. Two other dogs, each with a benign adenomatous polyp, appeared to have complete surgical excision on histologic exami-
nation; however, 1 dog had local recurrence of an adenocarcinoma 16 months later, and after complete excision of that mass, had a disease-free interval of 86 months. The other dog had local recurrence of a carcinoma 24 months after surgery and this was completely excised. This dog was euthanatized for unrelated reasons after a disease-free interval of 14 months. Tissue excised from 3 dogs during initial surgery, including both dogs with local recurrence, had histologic characteristics suggestive of malignant transformation. These changes ranged from adenomatous cells to the presence of highly dysplastic carcinoma cells. The third dog that had features suggesting malignant transformation was euthanatized for unrelated reasons after a disease-free interval of 5 months.

Outcome

Five dogs (plasmacytoma, adenocarcinoma[2], polyp, and leiomyoma) were lost to immediate follow-up (14 days). Mean follow-up on 18 dogs was 33 months with a disease-free interval of 34.8 months (range, 5–84 months). Six of these dogs were lost to later follow-up (range, 17–72 months) after surgery with a disease-free interval of 29.8 months. Nine dogs died for reasons unrelated to surgery or rectal tumor, and mean disease-free interval in these dogs at death was 39.8 months (range, 5–84 months). One dog had rectal bleeding associated with recurrence of a carcinoma, and the owners elected euthanasia 24 months after surgery. Two dogs are still alive 24 and 38 months after surgery.

DISCUSSION

We found that primary rectal tumors have low frequency (23 in 10 years) in our hospital population and that excision via an anal approach facilitated by rectal prolapse resulted in few complications and facilitated surgical excision of primary tumors of the
caudal rectum. Incomplete excision and local recurrence after surgery using an anal approach were relatively infrequent complications as has been reported previously.6 The small sample size and relatively long period of case accrual makes it challenging to draw definite conclusions about the treatment of choice for primary canine rectal neoplasia. However, the results of this study suggest that this is an effective surgical approach for treatment. Initial clinical signs and mean dog age at diagnosis were similar to previous reports.8,11 We identified all tumors by digital rectal examination whereas in previous studies only 60–63% were detected by rectal palpation.1,9 Depending on mass location within the rectum, various surgical approaches have been reported. Masses located in the caudal rectum have been removed by pedicle ligation with sharp dissection, tonsil snare, electrosurgery, cryosurgery, a dorsal rectal approach, and rectal pull-through techniques.1,12,11 Because of the regional anatomy, an anal approach for tumors of the cranial rectum may be more challenging, and colorectal, pararectal, intra-pelvic, and intra-abdominal structures cannot be accessed or inspected with this method.6 However, an anal approach with rectal prolapse, as we report, provided excellent exposure of caudal rectal lesions.

The extent of normal rectal tissue adjacent the tumor resected could not be determined from the medical records; however, at least a 1 cm margin of grossly normal adjacent rectal tissue was removed in each dog. It has been recommended that a minimum of 1–1.5 cm margins of adjacent normal tissue be removed in an attempt to ensure complete tumor excision, but there are no data to support this recommendation.12 Complications after surgical excision, particularly fecal incontinence, have been attributed to damage or removal of the caudal rectum (loss of storage capacity) or damage to the musculature or innervation of the anal sphincter. These complications are more likely to occur when aggressive resection is performed. Incontinence, infection, and stricture were not observed in our dogs but certainly should be considered as potential complications.

Complications occurred in 10 dogs (43%). These were limited to bleeding that required no further treatment and ceased within 24–48 hours after surgery and tenesmus, which resolved within 7 days after surgery. The presence of granulation tissue at the site of tumor resection in 1 dog suggested wound dehiscence, but no clinical signs were associated with this, and the wound had closed at 6 days.

Two dogs with apparently complete resection of benign polyps had local recurrence (1 carcinoma, 1 adenocarcinoma). Rectal tissue excised from these 2 dogs and 1 other had histological characteristics that suggested malignant transformation that ranged from adenomatous to highly dysplastic carcinoma cells. The apparent progression in these cases from rectal dysplasia to rectal carcinoma and adenocarcinoma is interesting, because observations of such histological changes have been suggested to be indicative of a higher propensity to malignant transformation.6,8 Progression from benign rectal polyps to invasive malignant disease has been clearly established in humans,13 but a relationship between adenomatous polyps and malignant transformation to carcinoma in dogs is unclear. However, observation of histologic characteristics suggestive of malignancy in otherwise benign rectal tumors in dogs suggests that such dogs should be examined at regular intervals after surgery and that a guarded prognosis should be given because of increased potential for recurrence.

**REFERENCES**