

Anal Sacculectomy

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ABSTRACT: Removal of the anal sacs is a frequently performed surgery in dogs. It is most often indicated for definitive treatment of chronic anal sacculitis. The anal sacs are intimately associated with the external anal sphincter; therefore, fecal incontinence resulting from damage to this muscle or its innervation is a potential complication of anal sacculectomy. Fistula formation and incisional infection are other possible complications. In general, the overall incidence of complications after anal sacculectomy is low.

Anal sacculectomy is a commonly performed surgical procedure in dogs. It is infrequently performed in cats.

ANATOMY

The anal sacs are specifically paranal sinuses formed by paired invaginations of the inner cutaneous zone between the internal and external anal sphincter muscles. The external anal sphincter is innervated solely by the caudal rectal nerves.¹ These nerves branch from the pudendal nerves in the ischiorectal fossa and enter the external anal sphincter at the caudolateral aspect of the muscle bilaterally, ventral to the anal orifice and in close proximity to the anal sacs. In the dog, the anal sac ducts open in the lateral margin of the anus at the anocutaneous junction, approximately at the 4- and 8-o'clock positions (Figure 1). The anal sacs and ducts are lined with squamous epithelium, with primarily apocrine glands and a few sebaceous glands embedded in the epithelium. In the cat, the ducts open in a more lateral position, and the anal sacs contain a more even distribution of sebaceous and apocrine glands. These anatomic differences may account for the low occurrence of anal sac disease in cats compared with dogs.²

INDICATIONS

The most common indication for anal sacculectomy is chronic anal sacculitis. Anal sac abscessation and neoplasia are also common reasons for anal sac removal. The exact cause of anal sacculitis is unknown,

although numerous predisposing factors, such as the size of the animal, obesity, skin disease, inflammatory intestinal disease, diet, and inactivity, have been proposed.^{2,3} The decision to surgically remove the anal sacs is based on the frequency of medical intervention, evidence of chronic impaction, or development of abscessation. Before surgery, the dog should be aggressively medically managed to decrease inflammation and infection and thereby help minimize postoperative complications. Simultaneous bilateral anal sacculectomy is typically performed in these cases.

The most common neoplasm associated with the anal sac is apocrine gland adenocarcinoma. This is a highly malignant tumor that is thought to most commonly affect older female dogs, although a more even distribution between sexes has been reported.^{4,5} This tumor is associated with a high rate of paraneoplastic hypercalcemia of malignancy. Metastasis, typically regional spread to the sublumbar lymph nodes, is common. Anal sacculectomy is only one aspect of treatment; resection of lymph node metastasis, radiation therapy, and chemotherapy are thought to be beneficial to survival. The median survival of treated dogs was reported in one study to be 544 days.⁶ Long-term survival (median duration: 20.6 months) has been reported in five dogs with metastatic anal sac carcinoma.⁷

TECHNIQUES

There are several different methods for anal sacculectomy, but surgical approaches can be simply

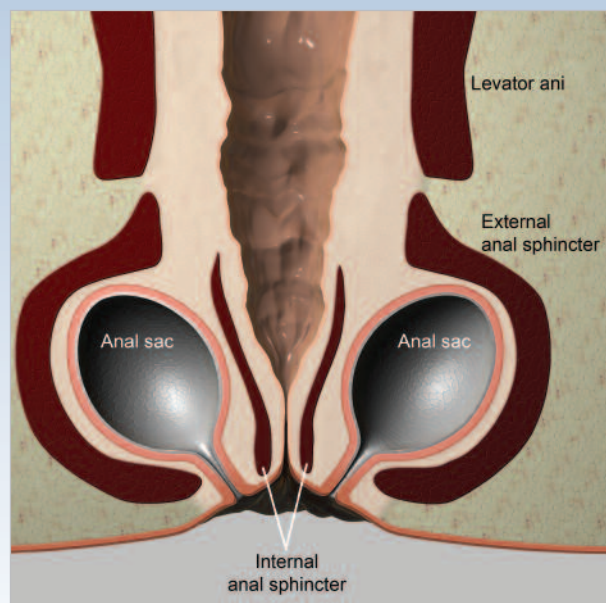
Figure 1. Position of anal sacs and ducts in relation to other anatomic structures.

Illustration demonstrating the relationship between the anal sacs and ducts and the internal and external anal sphincter muscles.

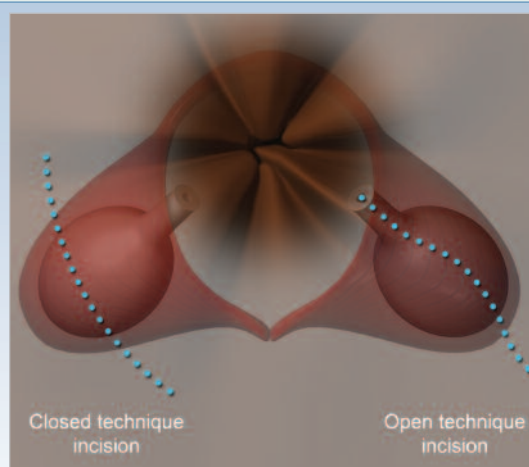


Photograph demonstrating the relationship between the anal sacs and ducts and the anal orifice.

categorized as open or closed techniques (Figure 2). Some surgeons prefer an open approach because of its speed and simplicity and because the lining of the anal sac is visualized to ensure complete removal.⁸ However, more extensive contamination of the surrounding tissue occurs than with use of a closed technique, which may increase the potential for postoperative incisional infection. Closed techniques are indicated in animals undergoing anal sacculectomy for tumor excision; however, some surgeons also prefer closed methods for cases of anal sacculitis due to the decrease in surgical site contamination. Regardless of the technique used, the potential for hemorrhage exists, particularly with aggressive dissection. Hemorrhage can be controlled with digital pressure or electrocautery. Blind grasping for bleeding tissue using hemostats or forceps can result in damage to the caudal rectal nerve and should be avoided.

Both open and closed techniques for anal sacculectomy can be performed using a carbon dioxide laser.⁹ The proposed advantages of this modality include decreased bleeding, reduced pain, less swelling, and decreased rate of infection relative to standard techniques.

Perioperative antimicrobial use is advocated because anal sacculectomy is considered a contaminated procedure based on the location of the surgi-

**Figure 2. Schematic diagram demonstrating the surgical incision locations for closed and open anal sacculectomy techniques.**

cal site. Regardless of the technique used, the animal is positioned in sternal recumbency with its hindlimbs hanging over the edge of a well-padded table (Figure 3). The tail is reflected over the dorsum of the dog and secured using 2-inch medical tape. A purse-string suture is placed to close the anal orifice, leaving the duct openings outside the suture. The perianal area is then surgically prepped.



Figure 3. A canine patient positioned in sternal recumbency for perianal surgery.

Open

Open techniques involve direct incision of the anal sac to expose the secretory lining. Using a scalpel blade, incise from the duct orifice down the entire length of the gland. Alternatively, pass one blade of sharp Metzenbaum scissors into the duct and anal sac. Elevate the tissue toward the surface while closing the scissors, thereby incising the gland and the overlying external anal sphincter muscle fibers, subcutaneous tissue, and skin. The open technique can also be accomplished by placing a grooved director through the duct into the most ventral part of the sac.⁸ Bring the tip toward the skin surface and make an incision over the director with a scalpel blade, spanning the entire length of the duct and sac.

Regardless of how the open incision is performed, grasp the anal sac with forceps and retract it through the incision. The sac can be distinguished from the surrounding tissue by the uniquely gray color of the epithelial lining, which may also have a shiny appearance. Using sharp and blunt dissection, completely remove the anal sac from the surrounding external anal sphincter. Take care to stay as close as possible to the anal sac to avoid additional damage to the sphincter muscle.

A modified open technique that requires only partial opening of the sac has also been described.¹⁰

Box 1. Filling Materials Reportedly Used in Closed Anal Sacculectomy Techniques

- | | |
|------------------------|--------------------|
| • Suture material | • Plaster of paris |
| • Umbilical tape | • Melted paraffin |
| • String or thread | • Curved hemostat |
| • Anal sac gel | • Grooved director |
| • Self-hardening resin | • Foley catheter |
| • Dental acrylic | |

This technique allows for a smaller incision and less trauma to the external anal sphincter than a traditional open technique. To perform this procedure, incise the duct orifice and continue the incision only until the lining of the sac is identified. Clamp hemostats on the incised tissue and continue dissection from the sac orifice in a ventrolateral direction toward the base of the sac. Keep dissection as close as possible to the anal sac to avoid damaging surrounding tissue without perforating the anal sac.

Closed

Closed techniques attempt to keep the anal sac completely intact, and dissection is directed from the base of the gland toward the duct. Make a vertical incision lateral to the anal orifice over the base of the sac. Use careful sharp and blunt dissection to free the anal sac from the muscular fibers of the external anal sphincter. The most difficult part of the procedure can be dissecting the anal sac away from the surrounding tissue. Tools that can help with this aspect of the surgery include delicate, curved Metzenbaum scissors, which can be used to follow the angles of the sac; a scalpel blade held at a flat angle, used to peel the muscle fibers away from the sac; and low-voltage electrocautery, used to strip away the surrounding tissue. Continue dissection from the base of the gland toward the duct. Ligate the duct with a small (4-0) monofilament absorbable suture before transection.

Several materials have been used to fill the sac to allow easier resection; however, some heated or self-hardening materials could cause dermal or subcutaneous inflammation¹¹ (Box 1). I prefer the Foley catheter technique described by Downs and Stampley¹¹ (Figure 4). In this technique, the balloon of a 6-Fr Foley catheter is inflated with 3 mL of saline. The distal part of the catheter beyond the balloon can be cut off to allow easier placement, particularly in smaller patients. The balloon is deflated, the catheter is inserted into the anal sac, and the balloon is reinflated. An incision is made over the base of the sac, which is now easily palpated. The sac is easily dissected from the tissue, and the balloon allows the sac to be removed with minimal disruption of the external anal sphincter. The size of the patient can be a limitation to the use of this technique because even the smallest Foley catheter may be too large for small dogs and cats.

Closure

Regardless of the technique used, the area should be thoroughly lavaged and closed routinely. In an open technique, the fibers of the external anal



Figure 4. A 6-Fr Foley catheter with the balloon inflated.

sphincter are reapposed with 3-0 or 4-0 monofilament absorbable suture using a simple interrupted pattern. Subcutaneous tissues are closed in a simple interrupted or simple continuous pattern using 3-0 or 4-0 monofilament absorbable suture. The skin is closed with simple interrupted or cruciate sutures using 3-0 monofilament nonabsorbable suture. An alternative is to appose the skin using a continuous

intradermal pattern using 3-0 or 4-0 monofilament absorbable suture. I prefer this closure method because it seems to minimize irritation in the perianal area and decrease the animal's tendency to lick the incision.

POSTOPERATIVE CARE

Postoperatively, dogs should be prevented from licking the surgical site through use of an Elizabethan collar. Stool softeners can be administered, although they are not usually necessary. Postoperative pain can typically be managed with oral analgesics. Opioids and opioid-like substances may cause constipation; therefore, NSAIDs may be preferred if there are no contraindications to their use. Antibiotics are often continued until suture removal because of the high level of contamination at the surgical site. The incision should be monitored closely for signs of infection until the sutures are removed 10 to 14 days after the surgery.

COMPLICATIONS

A recent retrospective study found that the standard open technique was associated with a greater number of short-term and long-term complications

Clinical Pearls

- Anal sacculitis is the most common indication for anal saccullectomy. The decision to perform surgery is based on the frequency of medical intervention, evidence of chronic impaction, or development of abscessation.
- Anal saccullectomy can be performed with either an open or closed technique. A closed technique has less surgical site contamination; an open technique allows visualization of the anal sac lining, facilitating complete removal.
- Regardless of the technique used, the surgeon should keep dissection as close to the sac as possible to minimize damage to the external anal sphincter and avoid injury to the caudal rectal nerves.

compared with a closed or modified open technique.¹⁰ Complications associated with anal saccullectomy include postoperative straining, incisional infection, fistula formation, anal stricture, and fecal incontinence. Fecal incontinence occurs if there is significant damage to the external anal sphincter or caudal rectal nerve. Damage is typically caused by aggressive dissection when removing the sac. If only one caudal rectal nerve is injured or if less than 50% of the external anal sphincter muscle is traumatized, fecal continence is usually retained. Transient fecal incontinence lasting from several days to 2 weeks may occasionally occur due to mild injury to the external anal sphincter muscle, neuropraxia resulting from surgical inflammation, or the animal's initial discomfort associated with voiding.

A fistula can form when any part of the epithelial lining of the anal sac is left behind. This complication also seems to be more likely when an open technique is used.¹⁰ Surgical exploration and resection of any residual tissue are required to resolve this complication. This is often a more technical surgery because the area must be delicately explored for all epithelial tissue, and the risk for nerve damage and hemorrhage is greater.

The overall rate of complications for anal saccullectomy is very low; therefore, the prognosis for nonneoplastic anal sac disease following anal saccullectomy is good to excellent.

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