

## Use of Polymethylmethacrylate in Anal Sac Removal – Sacculectomy in Dogs

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### Abstract

The use of polymethylmethacrylate aims to delineate the anal sac structures, proving to be the most efficient method in sacculectomy, as it petrifies within the glands, greatly facilitating surgical excision; although the literature recommends paraffin, as well as other substances. The objective of this article is to report a clinical case of the use of polymethylmethacrylate in the removal of anal sacs – sacculectomy in dogs. It was possible to conclude that this technique is the most efficient for sacculectomy in dogs, and can be performed by any veterinary surgeon, as well as the ease with which polymethylmethacrylate is found in the dental materials market.

**Keywords:** Polymethylmethacrylate; Sacculectomy; Surgery

### Introduction

The anal sacs are two oval structures situated between the fibers of the anal sphincter. Sacculectomy is imperative in cases of chronic inflammation, chronic fistulas, recurrent sacculitis, and the presence of adenocarcinomas. However, this is known to be a challenging procedure to perform, given the location and the high risk of contamination. Care must be taken to ensure that no fragments of the anal sac's glandular epithelium remain at the surgical site, as this could lead to recurrence and subsequent fistula formation. The anal sacs are roughly the size of an olive pit and drain into a small orifice

located bilaterally at the anocutaneous junction. These structures serve as a reservoir for secretions produced by sebaceous and apocrine sweat glands. This secretion is expelled in small amounts during normal defecation, acting as a territorial marker [1]. Anal sac disorders include infections, impaction, abscesses, and neoplasia. This condition affects approximately 10% of dogs, causing severe pain and chronic fistulation that leads to infections or duct obstruction [2]. While this pathology can occur in animals of any age, breed, or sex, it is more common in small and toy breeds. In some animals, it may be associated with seborrheic dermatitis or other dermatoses [3-5]. The specific causes of sacculitis remain unknown, though it is recognized as a multifactorial condition. According to Curti et al. [1], inflammation or impaction of the anal sacs leads to recurrence and chronicity; this may be linked to inadequate management and nutrition, as well as infectious, endocrine, allergic, behavioral, and idiopathic mechanisms. The use of polymethylmethacrylate aims to delineate the anal sac structures; it has proven to be the most efficient method for saculectomy because the material solidifies within the glands, greatly facilitating surgical excision—even though the literature also advocates for the use of paraffin and other substances. The use of paraffin is discouraged due to its heat sensitivity; the substance does not harden sufficiently to clearly delineate the anal sacs, and given that dogs have body temperatures exceeding 38°C, the paraffin may melt or be expelled during surgical manipulation. The aim of this article is to report a clinical case involving

the use of polymethylmethacrylate in the removal of anal sacs (saculectomy) in dogs.

## Literature Review

Clinical signs associated with sacculitis include irritation in the anal region, dyschezia, and constipation. Animals with abscesses may present with recurrent fistulas. In cases of neoplasia, ataxia, lumbar spine pain, and paresis or paralysis of the pelvic limbs may be observed, among other signs [1]. A presumptive diagnosis of anal sac disease can be made through physical examination and digital rectal examination [1,2]. The anal sac should be gently compressed to evaluate its contents [3]. Treatment depends on the stage of infection. Flushing, topical antibiotics, and dietary modification effectively treat most anal sac problems. Chronic cases may require the use of antibiotics based on antimicrobial susceptibility test results.

When medical management fails to produce clinical improvement or the cause is neoplastic, anal sacculectomy is indicated [4]. Surgical treatment involves the removal of both anal sacs; various techniques

exist for this procedure, such as the open and closed techniques [5]. In the open technique, the anal sac lumen is exposed, allowing secretions to come into contact with the surgical wound and hindering healing. In the closed technique, the structure is dissected without exposing the lumen.

According to Neto et al. [1], the closed technique allows for the use of filling material within the anal sac to facilitate its localization and differentiation from subcutaneous tissues.

Materials used for this purpose include paraffin, plaster of Paris, silicone sealant, dental acrylic, India ink, and distilled water. Both techniques are invasive, and additional procedures may be required. The surgeon's skill and proficiency are crucial for preserving structures such as the anal sphincter musculature. Short-term complications include excessive drainage, scooting, inflammation, and seroma formation. Long-term complications include persistent licking of the surgical site, fecal incontinence, fistulas, stenosis, tenesmus, rectal prolapse, dyschezia, and hematochezia.

### Clinical Case Report

Patient preparation involved a 12-hour fast and a rectal lavage two hours prior to surgery. After anesthesia was administered and the patient was placed in ventral recumbency, a cushion was positioned under the pelvic region, and the tail was elevated and tied up. The rectum was occluded with gauze, and the area underwent thorough local aseptic preparation. Polymethylmethacrylate was prepared in a small crucible, ensuring the consistency was not too thick, so that it could be drawn into a 5 mL syringe with a nozzle (Figure 1).



**Figure 1:** Preparation of polymethylmethacrylate.

Next, the syringe tip is inserted into the anal duct opening, applying pressure to fill the anal sac (Figure 2). After introducing a sufficient amount

to distend the anal sac, the syringe is held in place to prevent leakage until polymerization occurs.



**Figure 2:** Insertion of the syringe tip into the anal duct opening.

After a few minutes, hardening and a rise in local temperature of the anal sacs were observed, resulting from heat generated by the chemical polymerization reaction of polymethylmethacrylate. Once hardening was complete, the ablation of the anal sacs—with the glands defined by the polymerized

polymethylmethacrylate within them—was performed using a monopolar electrosurgical unit, taking care to spare the anal sphincter muscles, which are closely adhered to these structures. This technique has been performed on 85 dogs between 2018 and 2025 (**Figure 3 and 4**).



**Figure 3:** Anal sac ablation.



**Figure 4:** Anal sac ablation.

Subsequently, antibiotic coverage was provided using ceftriaxone (50 mg/kg) for 7 days and meloxicam (0.2 mg/kg) for 3 days. We conclude that this is the most efficient technique for saculectomy in dogs—performable by any veterinary surgeon—and note the ease with which polymethylmethacrylate can be obtained from the dental supply market.

### **Discussion**

Most authors agree that anal sacculitis is commonly observed in small animal clinical practice; it can occur in animals of any age, breed, or sex, though it is more prevalent in small and toy breeds (such as Poodles, Chihuahuas, and Cocker and English Springer Spaniels) and rare in cats [1,2]. While the breed of the patient in this report differs from those typically cited, the case confirms that all breeds are predisposed to developing the condition. As noted by Vieira Júnior [1], sacculitis can have an inflammatory or neoplastic origin. Inflammatory forms include inflammation proper, impaction, and abscess formation. Both cause discomfort and compromise the animal's quality of life, consistent with the case reported here, in which

the animal developed an infection resulting from duct obstruction that progressed to inflammation of the anal sacs. The most frequent clinical signs observed in the patient were dyschezia, pain, fecal incontinence, frequent dragging or rubbing of the anus on the ground, purulent discharge, tenderness, and behaviors such as circling and tail-biting; these findings corroborate descriptions in the literature [3-5]. The diagnosis for the animal in this report was based on the patient history and physical examination; the history revealed tail-chasing behavior, reluctance to sit, and dyschezia, while the physical examination showed a strong odor in the perianal region and edematous, easily palpable anal sacs. According to Fossum, the choice of therapy depends on the severity of the infection; options include medical management—such as manual expression, lavage, antibiotic therapy, and dietary changes—or surgical intervention in cases of recurrent severe impaction, anal sacculitis, abscesses, and anal sac adenocarcinoma. Given the chronic nature of the condition in this patient, preoperative tests were performed with a view to performing a saculectomy as the definitive treatment [4,5].

Two types of surgical procedures are employed: the open technique and the closed technique. The closed technique was used for this patient because it is less invasive, reduces the risk of contamination, and promotes healing. According to Vieira Junior, various materials have been used to fill and contour the anal sacs. In this case, polymethylmethacrylate was used; this was crucial in minimizing trauma to the structures adjacent to the anal sacs, thereby preventing postoperative complications. The prognosis for the patient in this report was considered favorable; according to the literature, the prognosis is good when the disease is non-neoplastic and not associated with perianal fistula. Postoperative antibiotic coverage was provided with ceftriaxone (50 mg/kg) for 7 days and meloxicam (0.2 mg/kg) for 3 days.

### **Conclusion**

Infection or obstruction of the anal sac ducts is a condition commonly diagnosed in routine canine clinical practice, and its etiology is considered multifactorial. This report demonstrates that a thorough clinical examination and an adequate patient history are sufficient for diagnosing the condition and selecting the best treatment. Surgical treatment utilizing polyethylene

facilitated good visualization of the anal sacs, resulting in an uncomplicated postoperative course.

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