

ORIGINAL ARTICLE

Local treatment for canine anal sacculitis: A retrospective study of 33 dogs

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Abstract

Background: Little information has been published regarding treatment of canine anal sacculitis (AS).

Objectives: Primary objective: determine the outcomes of AS local treatment at the referral dermatology service of the authors' institution. Secondary objective: determine signalment, body condition score (BCS), stool quality and comorbidities associated with AS.

Animals: Thirty-three dogs with AS presented to the referral dermatology service between 1 January 2010 and 31 March 2021.

Materials and methods: An electronic medical record search was conducted. Information regarding sex, breed, age at disease onset, weight, BCS, stool quality, comorbidities, treatment and treatment outcome were collected. Treatment outcome was categorised as “resolved clinically”, “clinical signs resolved per owner”, “did not complete treatment” or “failed”. Dogs were excluded if seen by another service, not treated for AS, or if perianal sinuses (fistulae), anal sac masses, or anal sac abscesses were identified.

Results: Nineteen dogs were male and 14 female. Twenty-four breeds were included. Average age at disease onset was 4.4 years. Average BCS was 5.8 of 9. Stool quality was “poor” in seven of 33 and normal in 23 of 33 cases. Atopic dermatitis was the most common comorbidity (12 of 33). Treatment typically consisted of anal sac flushing with saline followed by infusion using a commercially available steroid/antibiotic/antifungal ointment. Treatment was repeated on average 2.9 times. Resolution of AS was obtained in 24 of 33 cases, clinical signs resolved per owner in four of 33, five of 33 cases did not complete treatment, and no cases failed treatment.

Conclusions and clinical relevance: Local treatment with flushing and infusion is effective for treating AS in dogs.

KEY WORDS

anal sac, anal sacculitis, canine, dog

INTRODUCTION

Non-neoplastic anal sac disease (NASD) is common in dogs with an incidence ranging from 2% to 15.7%.^{1,2} A large epidemiological study reported a prevalence of 4.4% in nonreferral small animal hospitals.³ Non-neoplastic

anal sac disease can include impaction, inflammation with or without infection (also termed sacculitis), and abscessation. These conditions are seen as a continuum and differentiation between the individual conditions is poorly defined.³ The common criteria for diagnosis are: (i) impaction, defined as overfilling and distention of the

anal sac; (ii) anal sacculitis (AS), defined as inflammation of the sac lining with or without infection; and (iii) anal sac abscessation, which is when the walls of the anal sac are compromised due to infection, leading to localised cellulitis and eventually draining tracts.^{3,4} Anal sacculitis accounts for approximately 12% of all forms of NASD.³

For such a common disease, surprisingly little evidence-based information exists regarding risk factors and medical treatment of AS. Anal sacculitis is typically considered secondary to an underlying condition or risk factor. Occasionally, it is considered idiopathic.⁵ Risk factors including stool quality, diet type and changes, obesity, skin disease and breed have been proposed.^{2,6} Fibre-rich diets have been investigated for the treatment and prevention of NASD and treatment of AS with oral antibiotics has been discussed previously.⁷⁻¹⁰ Antibiotic resistance requires that systemic antibiotics be used judiciously. Treatment via anal sac flushing and infusion with a topical antibiotic and/or anti-inflammatory also has been described; the protocol and described outcomes are largely anecdotal.^{4,11}

This study was conducted to provide additional information on the features of AS in dogs and to validate the authors' perceived success with their anal sac flush and infusion protocol. The primary objective of this retrospective study was to determine the outcomes of local treatment for AS. A secondary objective was to determine signalment, body condition score (BCS), stool quality and comorbidities of dogs with AS.

MATERIALS AND METHODS

Computerised medical records from the authors' institution were searched electronically between 1 January 2010 and 31 March 2021 using the drop-down diagnosis of "anal sacculitis" or "infection - anal sac" and species as "canine". Clinical diagnosis was made based on the presence of clinical signs associated with AS (licking/chewing the perianal region, scooting, blood in the stool, or leaking anal sacs).¹² Diffuse thickening of the anal sac wall; haemorrhagic or purulent discharge during anal sac expression; and/or the presence of a larger than expected number of inflammatory cells, erythrocytes, large numbers of coccoid bacteria, intraneutrophilic bacteria, or yeast on cytological evaluation were subjectively used to support the diagnosis of AS.^{6,12-14} Gross appearance of anal sac contents and cytological composition were not used for diagnosis without corresponding clinical signs as both can be highly variable in clinically normal canine anal sacs.¹²⁻¹⁵ Dogs were excluded if (i) AS was diagnosed and treated by another service at the authors' institution as diagnostic criteria and treatment were not always consistent with that of the referral dermatology service, (ii) they were not treated for the disease, and (iii) they had one of the following conditions: perianal sinuses (fistulae), anal sac masses or anal sac abscesses – in such cases the AS was considered secondary.

The following epidemiological data were retrieved from the patients' medical records: sex, breed, age at disease onset reported by owners, age at presentation, weight and BCS. In addition, stool quality reported by the owners at the time of presentation and

comorbidities were collected. The following data were retrieved based on treatment before presentation at the authors' referral dermatology service: systemic antibiotics and glucocorticoid prescribed for the condition, other systemic medications, information regarding anal sac flush and/or infusions, and frequency of anal sac expression(s). The following data were collected based on treatment by the authors' referral dermatology service: perianal topical treatment prescribed at initial appointment, systemic treatment prescribed at initial appointment, anal sac flushing material, infusion medication, number of anal sac treatments, interval between treatments, and treatment outcomes.

Treatment outcome was classified as "resolved clinically" if resolution of AS clinical signs was confirmed by the clinician along with reported resolution of clinical signs by the owner; "clinical signs resolved per owner" if clinical signs were reported resolved by phone conversation with the dog's owner without confirmation of clinical resolution; "did not complete treatment" if the owner elected not to return as per recommendation or no communication with the owner was documented after the last treatment; and "failed" if AS did not resolve after six infusions performed in hospital.

Statistical methods

Descriptive statistics (mean, minimum, maximum, percentage) were performed on the information collected using EXCEL (Microsoft; Redmond, WA, USA).

RESULTS

There were 218 dogs diagnosed with "anal sacculitis" or "infection - anal sac" at the authors' institution during the study period. Of these, only 57 were patients of the referral dermatology service. Dogs were excluded for the following reasons: AS was treated by a different service (10), presence of perianal sinuses (fistulae) (eight), no treatment was performed for AS (three), presence of anal sac neoplasia (one), anal sac abscess (one), and infusions performed at home by the dog's owner (one). A total of 33 dogs met the study inclusion criteria.

Incidence

There were 3,731 dogs seen by the authors' referral dermatology service between 1 January 2010 and 31 March 2021. Based on the evaluated period, the incidence of AS was 1.5%.

Signalment, weight and BCS

Fourteen of 33 (42.4%) dogs were neutered males, 14 of 33 (42.4%) were neutered females and five of 33 (15.2%) were intact male dogs. There were 24 breeds (or mixes thereof) retrieved in this study. The average age at disease onset reported by owners was 4.4 years old (range = 0.4–11.1 years) and the average age at

TABLE 1 Patient signalment, weight, body condition score (BCS), comorbidities, and stool quality in dogs presenting with anal sacculitis

Case	Age at presentation	Age at disease onset	Breed	Sex	Weight (kg)	BCS (of 9)	Comorbidities	Stool quality
1	6.8	Unknown	Chihuahua	FN	3.1	Not recorded	None	Normal
2	8.3	6.3	Papillon	MN	13.2	7	AD	Normal
3	4.8	Unknown	Plott hound	FN	22.5	4	Ear margin seborrhoea	Not recorded
4	10.7	9.7	American bulldog	MN	41.0	4	AD, IBD, OE, bilateral CCLr	Diarrhoea
5	1.5	1.5	Irish wolfhound	MI	52.2	5	Pododermatitis	Normal
6	0.7	0.7	Chinese crested	MN	7.7	7	Deep pyoderma, OE	Normal
7	9.8	9.5	Labrador retriever	MN	45.0	8	None at time (later diagnosed with pelvic neoplasia)	Normal
8	2.9	2.8	Yorkshire terrier	FN	4.1	5	None	Normal
9	9	8	Labrador retriever	FN	29.7	6	Cutaneous mass	Normal
10	5	4.5	Maltese	FN	4.1	5	AD, OE	Normal
11	4.6	4.1	Golden retriever	FN	30.0	6	None at time (later diagnosed with AD)	Normal
12	6.5	6.3	Mixed breed dog	FN	9.7	5	AD, pinnal margin vasculitis, heart murmur	Normal
13	7.1	5.1	Vizsla	MN	25.5	5	Lipoma	Normal
14	9.2	7.2	Dachshund	MN	9.0	8	AD, cutaneous mass	Loose
15	5.1	4.6	Wirehaired dachshund	MN	5.2	5	None (later diagnosed with AD)	Normal
16	2.6	2.6	Golden retriever	FN	30.5	6	AD, OE, pododermatitis, lipoma	Normal
17	7.4	7.4	German shepherd dog	FN	28.0	5	Urinary incontinence, SLO	Not recorded
18	1	0.8	German shepherd dog	MI	32.2	4	Pica/dietary indiscretion	Normal
19	1.9	1.8	German shepherd dog	MI	47.5	5	None (later suspected to have AD)	Normal
20	2.7	1.7	Border collie	MN	23.9	6	None	Normal
21	7.9	Unknown	German shorthaired pointer	MN	51.7	9	AD, superficial pyoderma, OE, multiple cutaneous and subcutaneous masses, excessive nail growth	Normal
22	6.1	5.5	America Staffordshire terrier pitbull	MN	39.1	6	AD, OE, pododermatitis, oral mass	Normal
23	2	1.5	Labradoodle	MI	38.2	7	AD	Normal
24	2.9	Unknown	Miniature schnauzer	MN	10.9	6	AD	Normal
25	0.8	0.4	Plott hound	FN	16.4	5	None	Normal
26	4.2	1.2	Yorkshire terrier	FN	8.9	6	AD, perivulvar dermatitis, struvite crystals	Normal

TABLE 1 (Continued)

Case	Age at presentation	Age at disease onset	Breed	Sex	Weight (kg)	BCS (of 9)	Comorbidities	Stool quality
27	2.3	2	Labrador retriever	MIN	34.1	Not recorded	None	Normal
28	5.7	3.7	Goldendoodle	FN	26.2	7	AD, perivulvar dermatitis, arthritis	Not recorded
29	6	5.1	German shepherd dog	MI	46.3	7	Intermittent diarrhoea of unknown cause	Diarrhoea
30	7.3	5.3	Irish setter	FN	33.0	6	Intermittent diarrhoea of unknown cause, heart murmur	Soft
31	11.3	11.1	Brittany spaniel	MIN	22.5	6	Lymphadenopathy, OE, multiple cutaneous and subcutaneous masses	Loose
32	6.4	6	Boxer	FN	25.5	4	Gastrointestinal parasitism	Diarrhoea
33	2.3	2	American bulldog	MIN	29.3	5	Gastrointestinal parasitism	Soft

Note: Weight, BCS, comorbidities and stool quality reflect what was recorded at initial presentation. Abbreviations: AD, atopic dermatitis; BCS, body condition score; CCLr, cranial cruciate ligament rupture; IB, inflammatory bowel disease; OE, otitis externa; SLO, symmetrical lupoid onychodystrophy; FN, female neutered; MIN, male neutered; MI, male intact.

presentation to the authors' referral dermatology service was 5.2 years old (0.7–11.3 years). The average weight of the dogs was 25.6 kg (3.1–52.2 kg). The average BCS based on a scale of 1–9 was 5.8 (4–9). For this grading scale, a BCS of 4–5 was considered ideal.¹⁶ These findings are detailed in Table 1.

Stool quality and comorbidities

Stool quality was considered "poor" in seven (21.2%) cases. This included cases with diarrhoea (three), soft stool (two) and loose stool (two). Stool quality was considered normal in 23 (69.7%) cases and was not recorded in three (9.1%) cases. This was based on a subjective assessment made by owners and clinicians.

Patients with AS were recorded as having a total of 33 comorbidities. The most common comorbidity recorded was atopic dermatitis (AD), present in 12 (36.4%) cases. No comorbidities were recorded in nine (27.3%) cases. A complete list of stool quality and comorbidities is included in Table 1.

Treatment and outcomes

Eighteen of 33 (54.5%) dogs received systemic antibiotics for AS before presentation to the referral dermatology service. Of these dogs, five (27.8%) received a single course of a single antibiotic, three (16.7%) received multiple courses of a single antibiotic, nine (50.0%) received multiple courses of multiple antibiotics and one (5.6%) received systemic antibiotics but the type(s) were not recorded. Flushing and/or infusions had been performed before referral in eight (24.2%) dogs. Treatments prior to presentation are reported in Table 2.

At the initial referral service appointment, unilateral treatment was performed in six (18.2%) dogs, bilateral in 26 (78.8%) dogs, and laterality was not recorded in one (3.0%) dog. Apart from one case of unilateral disease which was treated bilaterally and one case where the affected side was not specifically recorded, side of disease and treatment corresponded directly. Although the AS treatment protocols were not standardised among the clinicians, generally it was similar and included: (i) expression of the anal sac using a gloved, lubricated finger; (ii) evaluation of the anal sac content for abnormalities (blood and/or purulent material) followed by cytological examination; (iii) gentle insertion of a lubricated Tom Cat catheter [3.5 French × 5½ inch (14 cm)], cut approximately in half at a right angle, into the anal sac opening and through the anal sac duct; (iv) attachment of a 6 mL syringe to the catheter and flushing the anal sac until the fluid obtained on expression ran clear; and (v) infusion of the anal sac using the same catheter with a commercially available steroid, antibiotic, and antifungal otic ointment until the anal sac was felt to be full and the product began to come out of the sac. The procedure was repeated until resolution of clinical signs, usually at two week intervals. Sedation to facilitate the treatment was performed according to

TABLE 2 Treatment of anal sacculitis (AS) before presentation

Case	Antibiotics prescribed for AS	Steroids prescribed for AS	Other medications for AS	Anal sac flushing and/or infusion
1	None	Tapering course of prednisone	None	No
2	Enrofloxacin, cefovecin, clindamycin, amoxicillin/clavulanic acid	Multiple methylprednisolone injections	Loratidine	No
3	None	None	None	None
4	Metronidazole, amoxicillin, clindamycin	Currently on prednisone for IBD	None	Yes, one performed one year ago, unknown protocol
5	Cefalexin [†]	None	None	No
6	None [‡]	None	None	No
7	Sulfa antibiotic	Prednisone	None	Yes, flushes with betadine, no infusion
8	None	None	Diphenhydramine, Otomax topically	Yes, one infusion
9	Enrofloxacin, clindamycin	None	None	No
10	Cefalexin	Tapering course of prednisone	Hydroxyzine, chlorpheniramine, diphenhydramine	No
11	None	None	None	Yes, flushed with dilute chlorhexidine and infused, two performed at two month interval
12	Amoxicillin/clavulanic acid [†]	Tapering course of prednisone	EnteDerm topically	Yes, 1 infusion performed
13	Metronidazole	None	None	No
14	Clindamycin, enrofloxacin, amoxicillin/clavulanic acid	None	Traumeel	Yes, infused three times at 3–4 day intervals and three times at 5–10 day intervals
15	None	None	None	No
16	None	None	None	No
w17	None	None	None	No
18	None	None	None	No
19	Cefalexin	None	Carprofen	No
20	Cefalexin (unknown amount)	None	None	Yes, unknown protocol or frequency
21	None	None	Oclacitinib	No
22	Ciprofloxacin, amoxicillin/clavulanic acid	None	Modified ciclosporin	No
23	None	None	Oclacitinib, carprofen, Glandex	No
24	Metronidazole	None	Oclacitinib, Long Dan Er Miao San, chiropractic care	No
25	None	None	None	No
26	Enrofloxacin, amoxicillin/clavulanic acid, cefpodoxime, metronidazole	Yes, no response	Lokivetmab, cold laser therapy	No
27	Amoxicillin/clavulanic acid [†]	None	Oclacitinib, carprofen	No
28	None	None	Carprofen, diphenhydramine	No
29	Amoxicillin/clavulanic acid, enrofloxacin	Yes, tapering course of prednisone	Otomax, tacrolimus, modified ciclosporin, ketoconazole	No
30	None	None	Oclacitinib	No
31	Enrofloxacin, cefalexin	None	None	No
32	None	None	None	No
33	Cefalexin, cefpodoxime	None	Glandex	No

Note: Treatments listed above reflect what was recorded in the medical records of the authors' institution. In cases where records from the primary veterinarian were available, these also were reviewed and information was included. Proprietary drug names:

nystatin/neomycin/thiostrepton/triamcinolone acetate (EnteDerm Ointment, MWI Animal Health; Boise, ID, USA), gentamicin sulfate/betamethasone valerate/clotrimazole (Otomax Otic Ointment, Merck Animal Health; Millsboro, DE, USA), a homeopathic anti-inflammatory gel (Traumeel, Heel-Vet; Baden-Baden, Germany) and a fibre supplement (Glandex, Vetnique Labs; Naperville, IL, USA).

[†]Denotes multiple courses of a single antibiotic.

[‡]Patient was on cefpodoxime for a deep bacterial infection at the time of presentation.

each patient's needs. The flushing fluid was sterile saline in 27 (81.8%) cases and was not recorded in six (18.2%) cases. An ointment containing gentamicin, mometasone, and clotrimazole was used for infusion in

24 (72.7%) dogs, and an ointment containing nystatin, neomycin, thiostrepton and triamcinolone was used in nine (27.3%) dogs. In one dog, an ointment containing nystatin, neomycin, thiostrepton and triamcinolone was

used initially, and then was switched to an in-hospital compounded solution of 1 mL ticarcillin clavulanate 3.1 g and 0.5 mL dexamethasone 4 mg/mL based on culture and susceptibility of *Pseudomonas aeruginosa*.

Anal sacculitis resolved clinically in 24 of 33 (72.7%) cases; clinical signs resolved per owner without clinical confirmation in four of 33 (12.1%) cases and five of 33 (15.2%) cases did not complete treatment. No cases met the criteria for failed treatment.

For the 28 dogs that completed treatment, the average number of flushings and infusions was 2.9 (1–6). The average interval between flushings and infusions was 16.8 days (5–80 days) and the median was 14 days. The type of infused medication did not appear to have affected the treatment outcome. Three (10.7%) of the 28 dogs experienced recurrence of AS. Two of these dogs were categorised as “resolved clinically”. The recurrence happened at an interval of 85 days for one and 445 days for the other. For both dogs, factors contributing to the development of AS were unknown. Another dog was categorised as “clinical signs resolved per owner” and experienced recurrence at 345 days. This dog later was diagnosed with seasonal AD which the attending clinician believed contributed to the development of AS. All three dogs who experienced recurrence responded well to a second round of treatment. Treatment and outcomes for each dog are summarised in Table 3.

At the initial appointment, topical perianal treatment was prescribed in 14 (42.4%) cases and new systemic medications were prescribed in seven (21.2%) cases. No systemic medications were prescribed in 19 (57.6%) cases. In five (15.2%) cases, medications for comorbidities were continued. The perianal abnormalities identified on physical examination, topical treatment and systemic treatment are detailed in Table 3.

DISCUSSION

This is the first retrospective study to report the success rate of local treatment of AS in dogs. Based on these results local treatment of AS is considered an effective alternative to oral antibiotic therapy. Using this approach, 72.7% of the cases achieved complete clinical resolution and an additional 12.1% had resolution of clinical signs as indicated by the owner. A previous prospective study found that one local infusion of 80% aqueous phenol solution following flushing with 0.9% saline solution was effective at resolving 100% of cases of AS for up to 60 days.¹⁷ While encouraging for the successful treatment of AS with local therapy, that study was limited by lack of detail about diagnosis and resolution, as well as having a small number of cases in each treatment category. Another study reported an estimated 60% success rate with oral antibiotics with or without flushing of the anal sacs.⁹ However, that study did not describe the number of dogs that received oral antibiotics alone, the number of dogs that received flushing of the anal sacs, and the total number of dogs that experienced resolution. Unfortunately, this lack of information impedes comparing the current study findings with this report.

In another more detailed study, NASD led to systemic antibiotic use in 1% of dogs in first-opinion practices in the UK, a similar rate to pyoderma.³ Over half of the dogs included in the current study had a history of systemic antibiotics prescribed for AS. Of these, 52.6% had multiple courses of multiple different antibiotics prescribed, and still required further treatment, indicating that AS may be a significant area of concern for unnecessary use of systemic antibiotics. The use of topical therapy alone could greatly improve antibiotic stewardship.

The incidence of AS identified in this study was lower than identified in previous studies. This discrepancy may be explained by the fact that previous studies evaluated the combined occurrence of NSAD in small animal practice, while this study only investigated AS in a specialty referral practice.^{1–3} One study identified a high incidence of AS of 12.5% in a combination of three veterinary practices in England and Australia.¹⁸ This may indicate a geographical difference, a changing incidence over time, and/or a difference between the patient populations of a general practice and referral dermatology service.

Several factors including stool quality, diet type and changes, BCS, skin disease, and breed have been suggested to lead to the development of AS.^{2,3,6} However, few studies investigating the aetiology of this condition exist.^{19,20} Of the comorbidities identified in this study, AD was the most frequent. This is consistent with the view that perianal inflammation and self-trauma, which occur with allergic skin disease, may contribute to anal sac duct stenosis, leading to impaction and sacculitis.³ Owing to the retrospective nature and limited number of dogs included in this study, the relationship between AS and the comorbidities identified could not be determined. Although a small percentage of dogs experienced recurrence, these recurrences may illustrate that the local treatment of AS addresses the condition and not the underlying cause. Therefore, further studies should focus on investigating the predisposing causes and risk factors for AS.

A previous study identified 75% of cases of AS as having a history of diarrhoea seven to 21 days before onset of clinical signs of AS.⁶ Diarrhoea was typically mild and self-limiting within one to two days.⁶ Sixty per cent of dogs in that study ate an all-meat diet and had poorly formed stool.⁶ A further 15% were regularly fed chop bones and had a history of rectal impaction.⁶ The current study suggests that stool quality plays a smaller role in the development of AS, with only 20.6% of dogs having poor stool quality at the time of presentation. The difference could be explained by the fact that all except two dogs in this study were primarily fed commercially available dog food. It also is possible that some incidences of poor stool quality may have resolved by the time of presentation and were not recorded in the medical records. Increased BCS also has been reported to be implicated in the development of AS.⁴ In the current study, the average BCS was 5.8 on a 9 point scale. Of dogs for whom body condition score was recorded, 54.8% were overweight with a BCS >6 and 9.7% were obese with a BCS of 8–9. Nearly half of the dogs had an

TABLE 3 Recorded treatment of anal sacculitis at initial appointment and treatment outcomes

Case	Perianal abnormalities	Perianal topical treatment	New systemic medication	Anal sac(s) affected	Anal sac(s) treated	Fluid used for flush	Medication used for infusion	Number of infusions	Interval between treatments (days)	Treatment Outcome
1	Erythema, alopecia	Mometamax	None	Both	Both	Sterile saline	Mometamax	3	12, 14	Resolved clinically
2	None	Mometamax	Glucocorticoid	Both	Both	Sterile saline	Mometamax	2	15	Did not complete treatment
3	None	None	Glucocorticoid	Both	Both	Not recorded	Mometamax	1	N/A	Clinical signs resolved per owner
4	Erythema, abrasions	Mometamax	None	Left	Left	Sterile saline	Mometamax	2	13	Did not complete treatment
5	Brown staining, erythema	Mometamax	None	Both	Both	Sterile saline	Mometamax	5	15, 14, 14, 14	Resolved clinically
6	None	None	None	Not recorded	Not recorded	Not recorded	Panolog	2	30	Did not complete treatment
7	None	None	None	Left	Left	Sterile saline	EnteDerm	6	9, 6, 14, 6, 35	Resolved clinically
8	Erythema, inflammation, pain	EnteDerm	None	Not recorded	Both	Sterile saline	EnteDerm	3	8, 8	Resolved clinically
9	Salivary staining	None	None	Both	Both	Sterile saline	EnteDerm†	5	5, 7, 7, 7	Resolved clinically
10	Erythema	EnteDerm	None	Left	Left	Sterile saline	EnteDerm	2	14	Resolved clinically
11	Hyperpigmentation, crust, comedones, abrasions	None	None	Both	Both	Sterile saline	Mometamax	3	16, 14	Resolved clinically
12	Erythema	None	None	Both	Both	Sterile saline	Mometamax	3	14, 11	Resolved clinically
13	Swelling, pain	EnteDerm	None	Both	Both	Sterile saline	EnteDerm†	2	16	Resolved clinically
14	Erythema	None	Psyllium husk	Both	Both	Sterile saline	Mometamax	1	N/A	Did not complete treatment
15	None	EnteDerm	None	Both	Both	Not recorded	EnteDerm	1	N/A	Clinical signs resolved per owner†
16	None	Mometamax	None	Both	Both	Sterile saline	Mometamax	2	13	Resolved clinically
17	Erythema, hypotrichosis	Chlorhexidine wipes	None	Both	Both	Sterile saline	Mometamax	2	14	Resolved clinically†
18	Erythema, scale, staining	Chlorhexidine wipes, EnteDerm	Diphenhydramine	Both	Both	Sterile saline	EnteDerm	2	12	Resolved clinically
19	None	None	Continue carprofen	Both	Both	Sterile saline	Mometamax	3	15, 13	Resolved clinically
20	Irritation	None	None	Both	Yes	Not recorded	Mometamax	3	13, 19	Resolved clinically
21	None	None	None	Left	Flush and infusion left, flush right	Sterile saline	Mometamax	3	14, 19	Resolved clinically
22	None	None	None	Both	Both	Sterile saline	Otomax	3	9, 13	Resolved clinically
23	Faecal material	None	None	Both	Both	Sterile saline	Mometamax	2	14	Resolved clinically
24	None	None	None	Both	Both	Not recorded	Mometamax	3	15, 68	Resolved clinically
25	None	None	None	Both	Both	Sterile saline	Mometamax	2	12	Resolved clinically†
26	Erythema, swelling, papule	None	None	Left	Both	Not recorded	Mometamax	4	14, 7, 80	Resolved clinically
27	None	Mometamax	None	Both	Both	Sterile saline	Mometamax	4	14, 64, 8	Resolved clinically
28	Brown staining, erythema	None	Glucocorticoid	Both	Both	Sterile saline	Mometamax	3	14, 20	Resolved clinically
29	Erythema, thickening, crusts, indentations	Tacrolimus, Otomax	Glucocorticoid	Both	Both	Sterile saline	Mometamax	3	14, 14	Clinical signs resolved per owner

TABLE 3 (Continued)

Case	Perianal abnormalities	Perianal topical treatment	New systemic medication	Anal sac(s) affected	Anal sac(s) treated	Fluid used for flush	Medication used for infusion	Number of infusions	Interval between treatments (days)	Treatment Outcome
30	Erythema, lichenification, hyperpigmentation	None	Glucocorticoid	Left	Both	Sterile saline	Mometamax	2	19	Did not complete treatment
31	Suspect sebaceous adenomas	None	None	Left	Left	Sterile saline	Mometamax	2	15	Resolved clinically
32	None	None	None	Both	Both	Sterile saline	Mometamax	3	14, 34	Clinical signs resolved per owner
33	Small erythematous nodule	Otomax	None	Both	Both	Sterile saline	Mometamax	2	16	Resolved clinically

Note: Perianal abnormalities and anal sac(s) affected reflect what was recorded at the initial appointment. New systemic treatment and perianal topical treatment reflect what was prescribed at the initial appointment. Proprietary drug names:

gentamicin sulfate/mometasone furoate monohydrate/clotrimazole (Mometamax Otic Suspension, Merck Animal Health; Millsboro, DE, USA); nystatin/neomycin/thiostrepton/triamcinolone acetate (EnteDerm Ointment, MWI Animal Health; Boise, ID, USA); nystatin/neomycin sulfate/thiostrepton/triamcinolone acetate (Panolog Ointment, Zoetis; Parsippany, NJ, USA); nystatin/neomycin sulfate/thiostrepton/triamcinolone acetate (Animax Ointment, Dechra Veterinary Products; Overland Park, KS, USA); gentamicin sulfate/betamethasone valerate/clotrimazole (Vetromax; Dechra Veterinary Products), and gentamicin sulfate/betamethasone valerate/clotrimazole (Otomax Otic Ointment; Merck Animal Health).

*Denotes a switch in infusion medication. In the first case, a compounded dexamethasone and ticarcillin/clavulanate was used for subsequent infusions and for the second, Animax® for the second infusion.

†Denotes recurrence of anal sacculitis. In the first case, the patient experienced a recurrence at 345 days. In the second, recurrence occurred at 445 days. In the third, recurrence occurred at 85 days.

ideal BCS of 4–5, so no conclusions can be drawn about the role of obesity in the formation of AS.

The primary limitations of this study are its retrospective nature and lack of standardisation of therapy. In some cases not all subjects of interest were recorded. Despite some differences in the treatment protocol, the recommendations were fairly consistent based on the clinical experience of the authors.

This study indicates that flushing and infusion using a steroid/antimicrobial topical medication is an effective treatment for AS. This offers an alternative to oral antibiotic therapy for this condition, aiding in antibiotic stewardship. Further investigation into this much neglected area of study is needed including aetiology, risk factors, prevention and prospective investigation of local AS treatment. Evaluation of the outcome of anal sac flushing without infusion and infusions with topical steroid with and without topical antibiotics are areas worthy of future study.

AUTHOR CONTRIBUTIONS

Annette Therese Lundberg: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; writing – original draft. **Sandra Nogueira Koch:** Conceptualization; methodology; project administration; supervision; writing – original draft. **Sheila MF Torres:** Conceptualization; methodology; project administration; supervision; writing – original draft.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

- Harvey CE. Incidence distribution of anal sac disease in the dog. *J Am Anim Hosp Assoc.* 1974;10:573–7.
- Corbee RJ, Woldring HH, van den Eijnde LM et al. A cross-sectional study on canine and feline anal sac disease. *Animals.* 2022;12:95.
- O'Neill DG, Hendricks A, Phillips JA et al. Non-neoplastic anal sac disorders in UK dogs: Epidemiology and management aspects of a research-neglected syndrome. *Vet Rec.* 2021;189:e203.
- Paterson S, Steen S. Anal sacs: a new approach to an old problem? *Vet Pract.* 2016;31–3.
- Bloom P. Anal sacculitis refractory to standard treatment. *Vet Med.* 2011;106:122.
- Halnan CR. The diagnosis of anal sacculitis in the dog. *J Small Anim Pract.* 1976;17:527–35.
- Beynen AC. Diet and anal-sac impaction in dogs. *Dier-en-Arts.* 2019;12:312–3. Available at: https://www.researchgate.net/publication/337811246_Diet_and_anal-sac_impaction_in_dogs. Accessed June 22, 2021.
- Ehrenzweig J. Novel fiber-rich supplement effective for prevention and treatment of acute, episodic and chronic anal gland disease in dogs and cats. *Int J Vet Anim Med.* 2018;1:104.

9. Halnan CR. Therapy of anal sacculitis in the dog. *J Small Anim Pract.* 1976;17:685–91.
10. Jones RL, Godinho KS, Palmer GH. Clinical observations on the use of oral amoxicillin/clavulanate in the treatment of gingivitis in dogs and cats and anal sacculitis in dogs. *Br Vet J.* 1994;150:385–8.
11. van Duijkeren E. Disease conditions of canine anal sacs. *J Small Anim Pract.* 1995;36:12–16.
12. James DJ, Griffin CE, Polissar NL et al. Comparison of anal sac cytological findings and behaviour in clinically normal dogs and those affected with anal sac disease. *Vet Dermatol.* 2011;22:80–7.
13. Lake AM, Scott DW, Miller WH et al. Gross and cytological characteristics of normal canine anal-sac secretions. *J Vet Med A.* 2004;51:249–53.
14. Robson DC, Burton GG, Lorimer MF. Cytological examination and physical characteristics of the anal sacs in 17 clinically normal dogs. *Aust Vet J.* 2003;81:36–41.
15. Pappalardo E, Martino PA, Noli C. Macroscopic, cytological and bacteriological evaluation of anal sac content in normal dogs and in dogs with selected dermatological diseases. *Vet Dermatol.* 2002;13:315–22.
16. Chun JL, Bang HT, Ji SY et al. A simple method to evaluate body condition score to maintain the optimal body weight in dogs. *J Anim Sci Technol.* 2019;61:366–70.
17. Durmus AS. Treatment of anal sacculitis in dogs. *Indian Vet J.* 2006;83:214–5.
18. Halnan CR. The frequency of occurrence of anal sacculitis in the dog. *J Small Anim Pract.* 1976;17:537–41.
19. McColl I. The comparative anatomy and pathology of anal glands. Arris and Gale lecture delivered at the Royal College of Surgeons of England on 25th February 1965. *Ann R Coll Surg Engl.* 1967;40:36–67.
20. Halnan CR. The experimental reproduction of anal sacculitis. *J Small Anim Pract.* 1976;17:693–7.

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Résumé

Contexte - Peu d'informations ont été publiées concernant le traitement de la sacculite anale canine (SA).

Objectifs – Objectif principal : déterminer les résultats du traitement local de la SA au service de dermatologie des auteurs. Objectif secondaire : déterminer le signalement, le score d'état corporel (BCS), la qualité des selles et les comorbidités associées à la SA.

Animaux – Trente-trois chiens SA présentés au service de dermatologie entre le 1er janvier 2010 et le 31 mars 2021.

Matériels et méthodes – Une recherche dans le dossier médical électronique a été effectuée. Des informations concernant le sexe, la race, l'âge au début de la maladie, le poids, le BCS, la qualité des selles, les comorbidités, le traitement et les résultats du traitement ont été recueillies. Le résultat du traitement a été classé comme « résolu cliniquement », « signes cliniques résolus par le propriétaire », « n'a pas terminé le traitement » ou « échec ». Les chiens ont été exclus s'ils étaient vus par un autre service, non traités pour la SA, ou si des sinus périanaux (fistules), des masses du sac anal ou des abcès du sac anal étaient identifiés.

Résultats – Dix-neuf chiens étaient des mâles et 14 des femelles. Vingt-quatre races ont été incluses. L'âge moyen au début de la maladie était de 4,4 ans. Le BCS moyen était de 5,8 sur 9. La qualité des selles était « mauvaise » dans sept cas sur 33 et normale dans 23 cas sur 33. La dermatite atopique était la comorbidité la plus fréquente (12 sur 33). Le traitement consistait généralement en un rinçage du sac anal avec une solution saline suivi d'une perfusion à l'aide d'une pommade stéroïde/antibiotique/antifongique disponible dans le commerce. Le traitement a été répété en moyenne 2,9 fois. La résolution de la SA a été obtenue dans 24 des 33 cas, les signes cliniques ont disparu dans quatre des 33 cas, cinq des 33 cas n'ont pas terminé le traitement et aucun cas n'a échoué au traitement.

Conclusions et pertinence clinique – Le traitement local par rinçage et perfusion est efficace pour traiter la SA chez le chien.

Resumen

Introducción- se ha publicado poca información sobre el tratamiento de la sacculitis anal canina (AS).

Objetivos – Objetivo primario: determinar los resultados del tratamiento local de la AS en el servicio de referencia dermatológica de la institución de los autores. Objetivo secundario: determinar la presentación clínica, la puntuación de la condición corporal (BCS), la calidad de las heces y las comorbilidades asociadas a la AS.

Animales – Treinta y tres perros con AS presentados al servicio de dermatología de referencia entre el 1 de enero de 2010 y el 31 de marzo de 2021.

Materiales y métodos – Se realizó una búsqueda en la historia clínica electrónica. Se recopiló información sobre sexo, raza, edad de inicio de la enfermedad, peso, BCS, calidad de las heces, comorbilidades, tratamiento y resultado del tratamiento. El resultado del tratamiento se clasificó como "resuelto clínicamente", "signos clínicos

resueltos por propietario", "no completó el tratamiento" o "fracasó". Los perros fueron excluidos si fueron vistos por otro servicio, no tratados por AS, o si se identificaron senos perianales (fístulas), masas en los sacos anales o abscesos en los sacos anales.

Resultados- diecinueve perros eran machos y 14 hembras. Se incluyeron veinticuatro razas. La edad promedio de inicio de la enfermedad fue de 4,4 años. BCS promedio fue 5.8 de 9. La calidad de las heces fue "mala" en siete de 33 y normal en 23 de 33 casos. La dermatitis atópica fue la comorbilidad más común (12 de 33). El tratamiento generalmente consistía en enjuagar el saco anal con solución salina seguido de una infusión usando un ungüento de esteroide/antibiótico/antifúngico disponible en el mercado. El tratamiento se repitió un promedio de 2,9 veces. La resolución de AS se obtuvo en 24 de 33 casos, los signos clínicos se resolvieron por propietario en cuatro de 33, cinco de 33 casos no completaron el tratamiento y ningún caso fracasó en el tratamiento.

Conclusiones y relevancia clínica- el tratamiento local con lavado e infusión intrasacular es eficaz para tratar la AS en perros.

Zusammenfassung

Hintergrund – Es gibt nur wenig publizierte Information über die Behandlung der analen Sackulitis des Hundes (AS).

Ziele–Primäres Ziel: Untersuchung der Ergebnisse lokaler AS-Behandlung im dermatologischen Überweisungszentrum der Institution des Autors. Sekundäres Ziel: Bestimmung von Signalement, Körperzustandswert (BCS), Kotqualität und Komorbiditäten im Zusammenhang mit AS.

Tiere – Dreiunddreißig Hunde mit AS wurden dem dermatologischen Überweisungszentrum zwischen 1. Jänner 2010 und 31. März 2021 vorgestellt.

Materialien und Methoden – Es wurde eine elektronische Datensuche durchgeführt. Es wurden Informationen in Bezug auf Geschlecht, Rasse, Alter bei Krankheitsbeginn, Gewicht, BCS, Kotqualität, Komorbiditäten, Behandlung und Behandlungsergebnis gesammelt. Das Behandlungsergebnis wurde eingeteilt in „klinisch geheilt“, „klinische Zeichen laut Besitzer geheilt“, „Behandlung nicht beendet“ oder „misslungen“. Hunde, die von einem anderen Service untersucht wurden, die nicht auf AS behandelt wurden, oder wenn perianale Fisteln (Fistulae), Analbeutelmassen oder – abszesse auftraten, wurden ausgeschlossen.

Ergebnisse – Neunzehn Hunde waren männlich und 14 weiblich. Es wurden vierundzwanzig Rassen inkludiert. Das Durchschnittsalter bei Krankheitsbeginn lag bei 4,4 Jahren. Der durchschnittliche BCS lag bei 5,8 von 9. Die Kotqualität war bei sieben der 33 Hunde „schlecht“ und bei 23 der 33 Fälle normal. Eine atopische Dermatitis war die häufigste Komorbidität (12 von 33). Behandlungen bestanden typischerweise aus Analbeutelspülungen mit Kochsalzlösung, gefolgt von einer Infusion mit einer kommerziell verfügbaren Salbe bestehend aus einem Gemisch aus Steroid/Antibiotikum/Antimykotikum. Die Behandlung wurde durchschnittlich 2,9mal wiederholt. Eine Heilung der AS wurde bei 24 der 33 Fälle erzielt, die klinischen Zeichen verschwanden laut BesitzerInnen bei vier der 33 Fälle, fünf von 33 Fällen beendeten die Behandlung nicht und bei keinem Fall ist die Behandlung misslungen.

Schlussfolgerungen und klinische Bedeutung – Eine lokale Behandlung mit Spülung und lokaler Infusion ist bei der Behandlung von AS von Hunden wirksam.

要約

背景 - 犬の肛門囊炎(AS)の治療に関する情報はほとんど発表されていない。

目的-第一の目的:著者らの施設の紹介皮膚科サービスにおけるASの外用治療の結果を明らかにする。第二の目的:シグナルメント、ボディコンディションスコア(BCS)、便の質、ASに関連する併発疾患を明らかにする。

供試動物 - 2010年1月1日から2021年3月31日の間に紹介皮膚科に来院したASの犬33頭。

材料と方法 - 電子カルテ検索を実施した。性別、犬種、発症年齢、体重、BCS、便の質、併発疾患、治療内容、治療結果に関する情報を収集した。治療結果は、「臨床的に解決した」、「臨床症状が飼い主ごとに解決した」、「治療が完了しなかった」、「失敗した」に分類された。他の診療科で受診した犬、ASの治療を受けていない犬、肛門周囲洞(瘻孔)、肛門囊腫瘍、肛門囊膿瘍が確認された犬は除外された。

結果-19頭がオス、14頭がメスであった。24の犬種を含んだ。発症時の平均年齢は4.4歳であった。便の質は33例中7例で「不良」、23例で「正常」であった。アトピー性皮膚炎が最も多く併存していた(33例中12例)。治療は、生理食塩水による肛門囊洗浄、市販のステロイド・抗生物質・抗真菌剤配合軟膏による注入であった。治療は平均2.9回繰り返された。33例中24例でASが消失し、33例中4例で臨床症状が消失し、33例中5例で治療が完了せず、治療が失敗した例はなかった。

結論と臨床的意義-犬のAS治療にはフラッシングおよび注入による外用治療が効果的であった。

摘要

背景-关于犬肛门囊炎 (AS) 治疗的已发表信息很少。

目的-主要目的:确定作者所在皮肤科转诊机构的AS 外部治疗效果。次要目的:确定与 AS 相关的体征、身体状况质量 (BCS)、粪便质量和并发症。

动物-2010年01月01日至2021年03月31日期间, 33只 AS 犬到转诊到皮肤科。

材料和方法-进行电子病历检索。收集了关于性别、品种、发病年龄、体重、BCS、粪便质量、并发症、治疗和治疗效果的信息。治疗结果分类为“临床症状消退”、“动物主人认为临床症状消退”、“未完成治疗”或“失败”。如果犬因其他原因就诊, 未接受 AS 治疗, 或者如果发现肛周瘻(瘻道)、肛门囊肿块或肛门囊脓肿, 则将其排除。

结果-19只犬为雄性, 14只为雌性。包括24个品种。发病时的平均年龄为4.4岁。平均 BCS 为5.8/9。33例中7例粪便质量“差”, 23例正常。特应性皮炎是最常见的并发症 (12/33)。治疗通常包括用生理盐水冲洗肛门囊, 然后使用市售类固醇/抗生素/抗真菌软膏灌注。平均重复治疗2.9次。24/33个病例的 AS 得到缓解, 4/33个病例主人认为临床症状缓解, 5/33个病例未完成治疗, 没有病例治疗失败。

结论和临床相关性-冲洗和灌注的外部治疗可有效治疗犬AS。

Resumo

Contexto – Poucas informações foram publicadas sobre o tratamento da saculite anal (SA) canina.

Objetivos – Objetivo primário: determinar os desfechos do tratamento tópico localizado da SA em um serviço especializado de dermatologia veterinária da instituição do autor. Objetivo secundário: determinar as manifestações clínicas, escore de condição corporal (ECC), qualidade das fezes e comorbidades associadas à SA.

Animais – Trinta e três cães com SA apresentados ao serviço de dermatologia entre 1º de janeiro de 2010 e 30 de março de 2021.

Materiais e métodos – Realizou-se um levantamento de prontuários eletrônicos. Foram coletadas informações sobre sexo, raça, idade no surgimento da doença, peso, ECC, qualidade das fezes, comorbidades, tratamentos e desfecho do tratamento. O desfecho do tratamento foi categorizado como “resolvido clinicamente”, “sinais clínicos resolvidos de acordo com o tutor”, “não completou o tratamento” ou “falhou”. Os cães foram excluídos do estudo se tivessem sido tratados em outro serviço, não tivessem sido tratados para SA, ou se fossem identificados abscessos, massas ou fístulas nos sacos anais.

Resultados – Dezenove cães eram machos e 14 fêmeas. Vinte e quatro raças foram incluídas. A idade média no surgimento da doença foi de 4,4 anos. O ECC médio foi 5,8 em 9. A qualidade das fezes foi ruim em sete de 33 cães e normal em 22 de 33 casos. A dermatite atópica foi a comorbidade mais comum (12 de 33). O tratamento tipicamente consistiu de lavagem dos sacos anais com solução salina seguido de infusão de uma solução comercial contendo esteroide/antibiótico/antifúngico. O tratamento foi repetido em média 2,9 vezes. Resolução da SA foi alcançada em 24 de 33 casos, os sinais clínicos se resolveram de acordo com o tutor em quatro de 33 casos, cinco de 33 casos não completaram o tratamento e em nenhum caso houve falha terapêutica.

Conclusões e relevância clínica – Tratamento tópico com lavagem e infusão é eficaz para tratar SA em cães.