Anal sacs: a new approach to an old problem?

THERE are numerous reasons why dogs will "scoot" on their bottoms but the most common of these is an attempt for them to empty their anal sacs.

Whilst we are uncertain what opportunities veterinary undergraduates get to hone their anal sac emptying skills before they qualify, there is no doubt that the frequent requests from dog owners to perform the ritual emptying during routine small animal consultations means that it doesn't take long for them to become highly adept at the art of anal sac evacuation once they do get their coveted MRCVS.

SUE PATERSON and STEPHEN STEEN review this common problem, including how often they should be emptied, and discuss some of the misconceptions about antibiotics to use for infections

What are anal sacs and why do they fill up? Anal sacs, sometimes mistakenly referred to as anal glands, are two small structures located between the internal and external sphincter muscles.

Each sac is lined with both sebaceous and apocrine glands whose combined secretions produce a semi-oil foul smelling brown liquid.

As the anal sphincter muscles expand, as defaecation occurs, pressure on the sacs leads to the expulsion of their contents over the faeces.

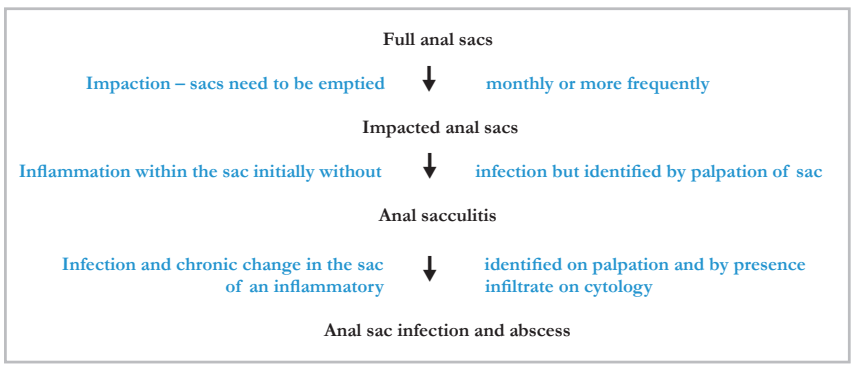

Figure 1. Possible progression of anal sac disease.

Table 1. Suggested reasons why anal sacs fill up

Reason	Comments
Change in the character of the secretion	Many anal sacs can be difficult to empty due to thick caseous nature of discharge. However, not all glands contain thick discharge
Excessive secretions	Histopathology from anal sacs does show hyperplastic changes in glandular tissue
Soft faeces or diarrhoea	Less likely as bacterial flora of anal sac does not mirror that of faeces (faecal flora typically *E. Coli*, *C. perfringens*, Enterococci, *Bacteroides spp.*)
Poor muscle tone	Anal sac problems seen in all ages and breeds and body scores of dogs; less likely cause
Obesity	

Table 2. Factors suggesting anal gland disease

Factor	Suggestive of anal sac disease	Suggestive of other cause of perianal irritation
Response to emptying anal sacs	Dog will stop scooting on perianal area without use of anti-inflammatory drugs but signs return within one month	Where scooting does not stop or only stops for a few days suggestive of other causes of perianal pruritus, e.g. allergy
Palpation of anal sacs	Anal sac feels knobbly or thickened	Anal sac feels smooth and thin
Anal sac contents	Thickened caseous discharge especially if blood stained	Thin discharge of any colour (providing not blood stained)
Anal sac cytology	Secretion shows signs of an inflammatory infiltrate, often with erythrocytes, with bacteria, often a mixture of rods and cocci (**Figure 2**)	Secretion shows signs of bacteria often rods and cocci without an inflammatory infiltrate (**Figure 3**)

Problems arise when this emptying process does not occur and the secretions build up in the sac, causing obvious discomfort to the dog.

There is very little high-quality information as to why anal sacs "overfill". Suggested reasons include change in the character of the secretion, excessive secretions, soft faeces or diarrhoea, poor muscle tone and obesity. Poodles, Chihuahuas and Lhasa apsos are said to be at increased risk of developing anal sac disease although most of this information is anecdotal.

The more difficult question to answer is how often should anal sacs be emptied and when if ever should they be packed or removed? When anal sacs are emptied it is important this is done per rectum.

Briefly, a gloved, lubricated finger should be inserted into the anus. Gentle pressure should be applied against a juxtaposed thumb. The discharge should be collected onto clean cotton wool. A bacteriology swab or cytology can be taken from the cotton wool.

The empty sac should be palpated to check for swelling and to assess the thickness of the walls. The perianal area should be cleaned with dilute antiseptic and the procedure should be repeated on the other side.

When the walls of a normal anal gland are palpated between finger and thumb they should feel smooth and the thickness of a balloon. Where there is chronic hyperplastic change in the wall or there is neoplasia they feel thickened and leathery.

One possible progression of the disease process is outlined in the flow chart – **Figure 1**.

Clinical decisions as to when over-full anal sacs progress to anal impaction, anal sacculitis, and then anal sac infection and abscessation, are challenging and must rely on history, clinical examination, cytology and where necessary culture.

In Hedlund and Fossum's *Small Animal Surgery* they suggest that anal sacculitis is diagnosed when moderate or severe pain is elicited on palpation and secretions are liquid yellow, blood tinged or purulent. Cytology, they suggest, reveals cellular debris, large numbers of leukocytes and numerous bacteria.

Several studies have compared anal sac cytology from normal and diseased sac. Studies by Lake (2004) and Robson (2003) suggest neutrophils and erythrocytes are rarely found in normal anal sac cytology. Lake's paper also suggests the characteristics of the discharge can be very variable in normal animals and that the colour, consistency and quantity of secretions can give little clue as to the status of the gland.

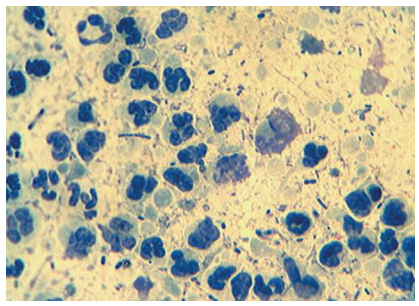

Figure 2. Cytology from anal gland showing inflammatory infiltrate with rods and cocci.

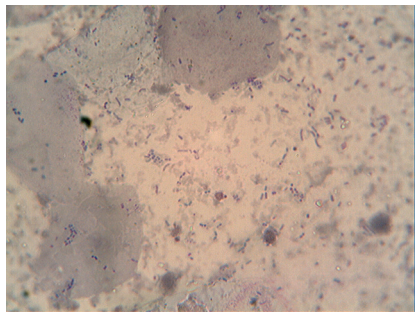

Figure 3. Cytology from anal gland showing rods and cocci but no inflammatory infiltrate.

Figure 4. Anal sacs may be flushed and then packed with an antibiotic solution.

A more recent study by James (2010) also showed that dogs with anal sac disease do have more neutrophils on cytology than normal dogs; however, the increased frequency of neutrophils in affected dogs was not found to be statistically significant.

That same study suggested there was no cytological difference between anal sac cytology from normal dogs and those with anal sac disease. However, many of the dogs in this study needed their anal glands emptying (evidenced by a return to "bottom scooting") after only seven days, suggesting that their perianal pruritus may have been caused by other factors.

Where relief of pruritus is so short-lived, perianal allergy must be a significant alternative reason for the "bottom scooting" (Maina, 2014). Important factors in the history that suggest the problem is related to anal

Table 3. Bacteria and yeast identified from normal anal sacs

Bacteria and yeast identified from normal anal sacs	Percentage of 20 anal sacs found to have organisms
E. coli	100
Enterococcus faecalis	70
Proteus mirabilis	30
Staphylococcus pseudintermedius	20
Pseudomonas aeruginosa	10
Enterococcus casseliflavus	10
Malassezia pachydermatis	10

Table 4. Bacteria and yeast identified from infected anal sacs

Bacteria and yeast identified from infected anal sacs	Percentage of 20 anal sacs found to have organisms
Enterococcus faecalis	90
E. coli	90
Proteus mirabilis	70
Pseudomonas aeruginosa	10
Streptococcus canis	20
Staphylococcus pseudintermedius	5
Malassezia pachydermatis	0

sac disease are summarised in **Table 2**.

Whilst the authors would accept that the presence of bacteria, erythrocytes and neutrophils on cytology could be suggestive of anal sac disease, a diagnosis should only be made when other criteria are included. The authors would suggest at least three out of four of the criteria in **Table 2** should be present to suggest anal sac disease.

Where dogs are re-presented on a regular basis to have their anal sacs emptied, and where abnormalities are detected, then it is often beneficial to flush and pack the sacs. Where such a procedure fails to resolve the problem then anal sac removal may be necessary.

There are many misconceptions as to the best antibiotics to use for anal sac infections. The authors examined the discharge from 20 normal anal sacs of 10 dogs considered not to be diseased (based on the criteria in **Table 2**) and 20 anal sacs from 20 dogs with disease (either anal sac infection or anal sac abscessation) to identify the bacterial flora present and their antibiogram. The data are contained in **Tables 3 and 4** *(see overleaf)*.

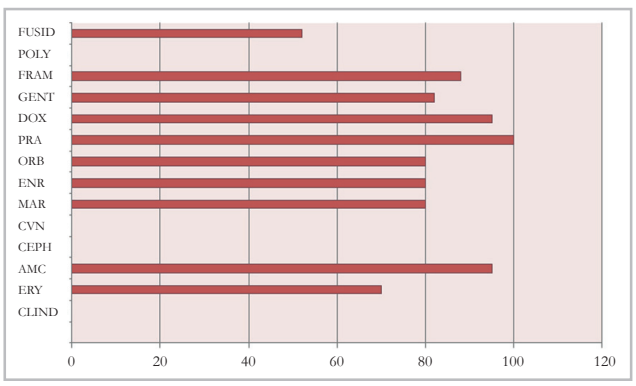

Table 5. Antibiotic sensitivity pattern of* Enterococcus faecalis *(y axis antibiotic, x axis percentage).

Key to antibiotics: Fusid – fusidic acid, Poly – polymyxin, Fram – framycetin, Gent – gentamicin, Dox – doxycycline, Pra – pradofloxacin, Orb – orbifloxacin, Enr – enrofloxacin, Mar – marbofloxacin, Cvn – cefovecin, Ceph – cephalexin, Amc – clavamox, Ery – erythromycin, Clind – clindamycin.

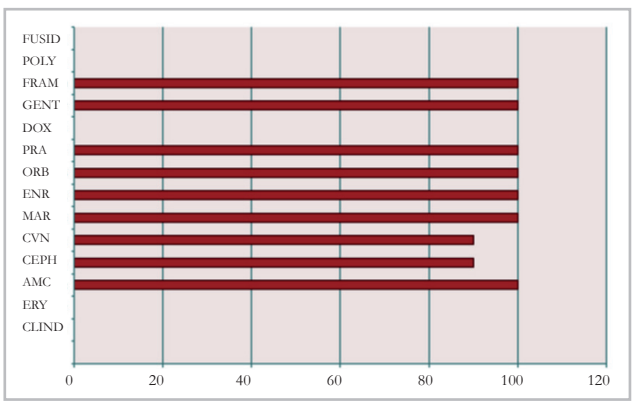

Table 6. Antibiotic sensitivity pattern of* Proteus mirabilis *(y axis antibiotic, x axis percentage).

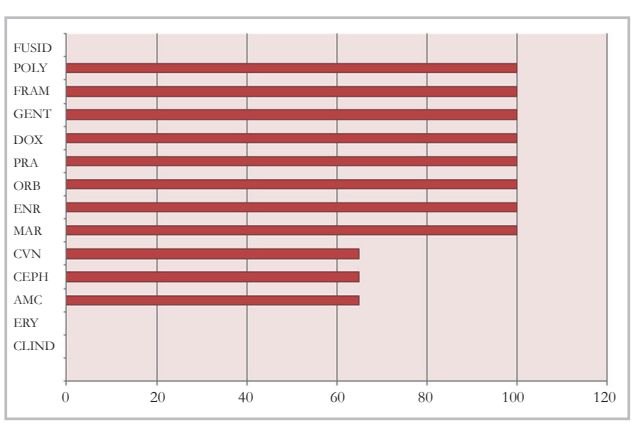

Table 7. Antibiotic sensitivity pattern of* E. coli *(y axis antibiotic, x axis percentage).

The bacteria found in normal anal sacs and infected sacs are very similar, which is why culture results alone should not be used to make a diagnosis of anal sac disease. Interestingly, the profile of the anal sac organisms from normal sacs does not mirror that of either canine skin or faeces.

The most significant change in pathogen profile between these two small studies is the increased numbers of *Proteus mirabilis* in the group of dogs with infection.

Proteus mirabilis (like *E. coli*) is a Gram-negative facultative anaerobic rod-shaped bacterium. It characteristically produces a very distinct "fishy odour" which probably accounts for a large part of the smell associated with anal sac secretions.

Whilst *Enterococcus faecalis* is capable of growing at a wide range of different temperatures, *Proteus mirabilis* and *E. coli* grow best at mammalian body temperatures, the optimum growth temperature for *Proteus mirabilis* being slightly higher at 40ºC than *E. coli* (37ºC), which might explain why inflammation within an infected sac may lead to a switch in the two populations of bacteria.

The second stage of this study, undertaken by the authors, was to assess antibiotic sensitivity for a range of topical and systemic antibiotics.

Although antibiotic sensitivity was performed for all of the organisms identified on culture, only the results for the most "significant" organisms – *Enterococcus faecalis*, *E. coli* and *Proteus mirabilis* – are reported in **Tables 5, 6, 7 and 8**.

Antibiotic sensitivity becomes important when anal sac infections require therapy. Where there is anal sacculitis and infection within an intact anal sac, the authors would generally select a topical antibiotic.

A suitable protocol might include, after sampling the sac for cytology and culture, to flush the sac using an antiseptic solution such as chlorhexidine and triz EDTA, and then pack it with a topical antibiotic (**Figure 4**).

Although off-license use of bovine intramammary preparations containing clavamox and prednisolone is useful, the author (SP) would prefer to use a product with an anti-yeast component.

Ear preparations containing aminoglycosides such as framycetin and gentamicin would seem good first choices. Fluoroquinolones should be used as a second choice antibiotic.

Where possible, the author (SP) would choose a preparation that is oil-based rather than propylene glycol-based to avoid any potential irritant reactions to the latter. Where anal sacs have formed an abscess and ruptured, systemic antibiotics are important.

Useful choices in these situations, based on **Table 8**, would be clavamox as a first line choice and a fluoroquinolone as a second line option, the data showing no significant difference between enrofloxacin, marbofloxacin and pradofloxacin.

Whilst the authors are aware that Gram-negative rods display innate resistance to certain of the antibiotics listed, notably fusidic acid, erythromycin and clindamycin, and enterococci are innately resistant to clindamycin and the cephalosporins, this is not something that clinicians are familiar with and likely explains the very high incidence with which clindamcyin is prescribed in anal sac disease.

Where disease is recurrent or where palpation of the sac suggests the potential presence of neoplasia, anal sac removal is preferable.

References and further reading

James, D. J., Griffin, C. E., Polissar, N. L. and Neradilek, M. B. (2011) Comparison of anal sac cytological findings and behaviour in clinically normal dogs and those with anal sac disease. *Vet Derm* **22** (1): 80-87.

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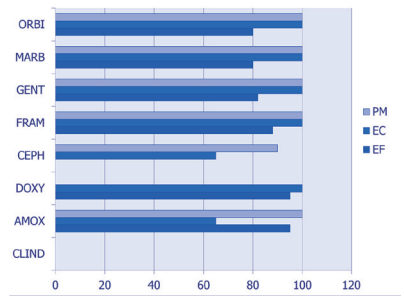

Table 8. Selected systemic and topical antibiotics with sensitivity patterns against common anal sac pathogens [*Proteus mirabilis *(PM),* E. coli *(EC),* Enterococcus faecalis *(EF)] (y axis antibiotic, x axis percentage).

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