

Perianal sinus: A medical disease?

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Figure 1
Typical appearance of perianal sinus in the German Shepherd dog.

KEY POINTS

- Perianal sinus mainly affects German Shepherd dogs, although it is not restricted entirely to this breed.
- The diagnosis of this condition is relatively simple – the differential diagnosis is limited, with anal sac abscess and perianal neoplasia being the most likely alternatives.
- Two recent studies in the use of cyclosporin A in the management of perianal sinus have demonstrated great promise.

INTRODUCTION

Perianal sinus (anal furunculosis, perianal fistula) is a term given to a disease entity involving pyogranulomatous inflammation of the perianal skin and sub-cutis in the dog (Figure 1) (1). The condition mainly affects German Shepherd dogs (GSDs), although it is not restricted entirely to this breed. It may be chronic and destructive, with varying degrees of discomfort experienced by affected dogs. Unless treated, it causes a loss of defecatory function or intolerable pain in most cases.

Various treatment regimens have been recommended, and until recently the weight of opinion lay with a surgical approach. Recent studies using cyclosporin have challenged this view.

ETIOLOGY AND PATHOGENESIS

Many mechanisms have been suggested for the cause of this disease and its progression. It was initially likened to *fistula in ano* in humans, caused by impaction of fecoliths in the anal crypts and pillars (2); this leads to sinus formation at the site and, eventually, to fistulae between the rectum and perianal skin.

This is not the case in the dog, where a true recto-cutaneous

fistula formation is very uncommon (3). For this reason the term 'perianal sinus(es)' is preferred. In one study, hidradenitis of the apocrine sweat glands in the cutaneous zone of the anus was the earliest and most common lesion seen. Several studies have highlighted the progression from abscessation of hair follicles and/or cutaneous glands to sinus formation (1–4). This is now accepted as the true version of the development of this disease.

The underlying etiology or combination of factors causing progression of the disease is more problematic. It has been assumed that there is some sort of immunological mechanism or fault for this (5), and a primary genetic factor must be suspected due to the overwhelming predisposition of the GSD. However, despite extensive pedigree analysis, no evidence of simple inheritance has been uncovered. The presence in the predisposed group of GSDs of an underlying immunological defect is supported by the high incidence of concurrent inflammatory bowel disease in affected dogs (6).

Historically, attention was focused on the hygiene of the perianal region. The tight tail carriage and moist perineum of the GSD has been cited as a likely underlying cause (2). However, these are not features of all affected GSDs, and high tail amputation is not a successful treatment in all cases (7). Also, breeds with a similar conformation to the GSD are not as frequently affected (3).

A micro-anatomical explanation was sought, but although the GSD was shown to have a higher density of apocrine glands in the perianal skin compared with other breeds, this is not enough to explain the initiation of disease (8). More recently, the relationship between thyroid status and this disease has been examined without the establishment of a link (9).

In the same study, some dogs were shown to have a degree of immunosuppression, as gauged by lymphocyte stimulation response tests. Some of these dogs improved following recovery from disease. However, studies of inflammatory cells (B-lymphocytes/plasma cells and T-lymphocytes) in tissue excised from affected dogs (GSDs and other breeds) and normal dogs failed to provide evidence of a simple immunological defect responsible for the breed predisposition (10). Likewise, histological examination of tissue taken from affected GSDs and other breeds failed to reveal a significant difference in the



Figure 2 Lesions overlying the opening of the anal sac ducts.



Figure 3 Severe disease limited to the glabrous cutaneous zone of the anus.



Figure 4 Chronic disease with marked anal stenosis.

appearance of the pathology in the two groups (4).

Recent trials have involved cyclosporin in the treatment of this disease (5, 11). Cyclosporin exerts specific effects on the immune response, blocking proliferation of activated T-lymphocytes, specifically T-helper cells, by inhibiting IL_2 production (12). The efficacy of this drug in almost all dogs treated, and the failure of corticosteroids to ameliorate the condition suggests once more that a specific immunological mechanism is involved. While a genetic defect of some kind is suggested by the predisposition of a single breed, the wide age range at first presentation with perianal sinus (unlike most genodermatoses) suggests that other factors are involved. The area of these specific trigger factors requires more work, as individual management may help to reduce the recurrence rate in predisposed dogs.

CLINICAL PRESENTATION

Perianal sinuses are tracks of varying depth involving the perianal skin and the cutaneous zone of the anus. Lesions are frequently found in the area overlying the anal sacs (**Figure 2**). Sinuses may extend to a considerable depth and may track under the ventral aspect of the tail, into and through the pelvic diaphragm, and along the medial aspect of the thigh. Perhaps surprisingly, true recto-cutaneous fistulae are rare. In some cases, however, disease appears to be limited to the glabrous cutaneous zone of the anus (**Figure 3**).

The disease has an enormous range of clinical signs (**Table 1**). In some dogs with apparently severe disease, lesions may be noticed only at routine examination or if hemorrhage occurs. In many cases the owners become aware of the condition only when the dog suddenly starts to lick at the perianal region. This is not a cause of disease.

In other cases, the disease may be associated with severe pain on defecation and there may be marked tenesmus. Feces may be changed in shape (smaller or flatter), and some dogs may show considerable reluctance to defecate at all. Some long-standing cases may show severe stenosis of the anal canal (**Figure 4**). In others there is a previous history of anal sac disease (but this is not a consistent feature).

The age range at first presentation is considerable, studies having documented cases where disease has commenced at anything from 6 months to 10 years of age (2, 3). There is no evidence of a sex predilection.

Table 1

Clinical signs associated with perianal sinus

- Tenesmus
- Dyschezia
- Excessive licking of perianal region
- Change in shape of feces
- Constipation
- Rectal or anal bleeding
- Malodorous discharge from sinuses or anus
- Diarrhea
- Weight loss

DIAGNOSIS

The diagnosis of this condition is relatively simple. The differential diagnosis is limited, with anal sac abscess and perianal neoplasia being the most likely alternatives. In the GSD, anal sac abscess may lead to a persistent sinus and is an important initiating factor. Should there be any doubt about the diagnosis following history and clinical examination, a biopsy of the affected area should be performed prior to therapy. The histological appearance is, however, not pathognomonic, and chronic, nonspecific inflammation with fibrosis and granulation is most frequently discovered (3). This will, however, rule out neoplasia.

Assessment of the extent and depth of sinuses has been recommended, as this may influence the surgical technique required (**Figures 5, 6**). The prognosis is not always proportional to the extent of disease, and it can be very difficult to assess the likelihood of recurrence.

The presence of concurrent disease should be identified; hypothyroidism and inflammatory bowel diseases are relatively common in affected dogs. While neither of these conditions cause perianal sinus, failure to identify or control them will result in a reduced chance of successful treatment. Other causes of immunosuppression, such as hyperadrenocorticism, may be involved, particularly in non-GSD breeds. For this reason, a full history and clinical examination should be made in all dogs with perianal sinus.

In the GSD, perianal sinus may be accompanied by more generalized disease in the form of German Shepherd folliculitis, furunculosis, and cellulitis syndrome. This condition is histologically almost indistinguishable from perianal sinus and is also thought to involve an immunological defect (13). However, it differs in being





Figure 5 Disease may appear to be quite mild on the first examination...



Figure 6 ...But sinuses may connect and be of considerable length and depth.

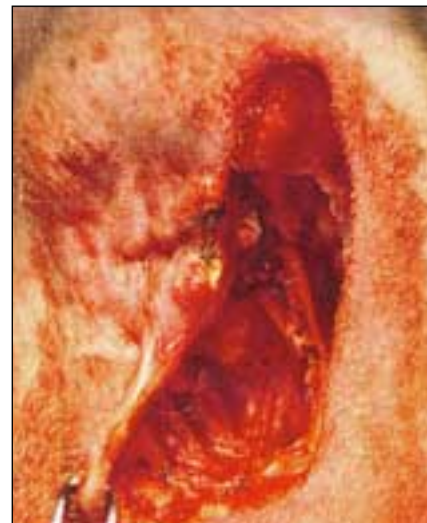


Figure 7 Extensive dissection may be necessary to excise all affected tissue.

amenable, in most cases, to antibacterial therapy although lengthy courses are usually needed.

TREATMENT

Surgical

Many surgical techniques have been used to treat perianal sinus. Most of these have involved:

- The deroofing of sinus tracks followed by either chemical cautery (14), electrical fulguration (15), or cryosurgery (16).
- The surgical ablation of all diseased tissue. This has been achieved using sharp surgery, diathermy excision (17), or, more recently, the ND/YAG laser (18).

It has been emphasized in most studies that meticulous dissection should be undertaken in order to ensure the removal of all sinus tracks and to avoid the removal of no more sphincter musculature than is necessary (**Figure 7**). Obviously, the more muscle that is removed, the greater the likelihood of fecal incontinence.

Following surgical ablation of all sinus tracks, primary closure is attempted or wounds are left to undergo secondary intention healing. Despite the contamination likely in the perianal region, leaving wounds open does not appear to reduce the likelihood of healing. All of these techniques have been variously accompanied by the removal of the anal sacs, either routinely or if considered involved in the disease.

One other approach has been recommended – that of high tail amputation (at the C2/C3 level) (6).

None of the surgical techniques suggested are universally successful, and recurrence rates or complications may be high. Reported cure rates have varied widely, as has the severity of disease in different reports, making the results of different studies difficult to compare (**Table 2**). For example, the use of deroofing followed by chemical cautery would appear to be very successful, and yet this technique has been rejected by most workers in the field. It is accepted that for severe disease, complete excision of sinus tracts is essential and that in many studies the removal of anal sacs has improved cure rates significantly (3, 17).

Medical

Until recently it was widely accepted that medical management was not as successful as surgery in treating perianal sinus in the dog (1, 3, 11). Despite the isolation of many bacterial forms from affected

Table 2

Comparison of different surgical techniques

Technique (Reference)	No. of cases	Successful outcome %	Recurrence %	Complications %	
				Stenosis	Incontinence
Excision (2)	43	60	45	9	28
Cryosurgery (16)	40	88	10	3	0
Chemical cautery (14)	28	96	17	0	0
Deroofing and fulguration (15)	30	60	70 ¹	10	7
Tail amputation (6)	25	80	20	5	0

¹ Any cases requiring further treatment were deemed in this study to have recurred, even if they failed to respond to the initial therapy.

tissue (especially *E. coli*, *Staphylococcus aureus*, and β -hemolytic streptococci) (19), lengthy treatment with antibiotics chosen on the basis of antimicrobial sensitivity testing is rarely effective in the resolution of sinuses or in the prevention of recurrence. Recently, however, two studies in the use of cyclosporin A in the management of perianal sinus have demonstrated great promise (5, 11). Unfortunately the cost of this treatment may render it inappropriate in many cases. One of these studies (5) has questioned the dosage rate required; should lower doses than those initially studied be effective, this situation may change.

Another finding is the potential role of the anal sacs in the continuation of disease. Previous involvement of the anal sacs was demonstrated as a major cause of continued or recurrent sinuses. Their removal was once more recommended. It would appear that anal sac removal is wise whichever mode of therapy is undertaken (3, 5).

CONCLUSIONS

Perianal sinus is a difficult disease to manage. Currently, the surgical approach, involving the meticulous removal of all diseased tissue, including the anal sacs, appears to be the most likely to be successful. However it is important to identify and correct underlying and concurrent disease. In the future, the promise of therapies such as cyclosporin may limit or remove the need for surgical intervention.

On presentation

Initially a full history is taken, paying particular attention to signs of concurrent bowel disorders and, in older dogs, to signs suggestive of underlying endocrinopathy. Within the history of the perianal disease, initiating factors such as severe constipation (usually following ingestion of bones) or previous anal sac disease are sought. It is also important to define the extent of the problem: If the dog shows no signs of discomfort, it is inappropriate to rush into surgery and leave the dog with fecal incontinence.

Following the history, a complete physical examination is performed, followed by assessment of the severity of disease. The latter may only be performed under general anesthesia, and even then the depth of sinuses may only be judged in some cases on excision of overlying granulation tissue. Examination for anal sacs or their remnants is also useful.

Should there be evidence of underlying disease, this should be investigated before surgery unless the dog is in severe discomfort. At the same time, antibiotics may be administered to reduce the bacterial component prior to surgical intervention. This should address the added possibility of anaerobic infection. It must be remembered that the use of potentiated sulfonamide antibiotics are inappropriate if the dog is to be tested for thyroid function.

Following history-taking and examination, discussion of the prognosis, the aims of therapy, and possible long-term complications may take place. In a disease as likely to recur as this, it is essential to define the objectives and to try to assess a realistic goal for therapy, which may not be clinical cure in all cases.

Surgical technique

Preparation for surgery

Prior to surgery, dogs should be starved for at least 36 hours. Once anesthetized, the perineal region is clipped. The anal sacs, if present, are emptied and flushed with saline. The dog is positioned in sternal recumbency, preferably with the table tilted. The perineal region is scrubbed and draped for surgery, remembering that the sinuses may extend far beyond the visible lesions.

Surgical approach

Starting at the periphery, all affected tissue is excised by diathermy excision. If disease is limited to the cutaneous zone of the anus, the whole zone may have to be removed. Care should be taken to preserve as much underlying muscle as possible. Good lighting is an essential prerequisite for this, as the differentiation between affected and normal tissue may be small. Unless the dissection avoids the area of the anal sacs completely, these should be removed. If anal sacs cannot be located visually, pressure applied to the appropriate region may produce some tell-tale discharge.

Once all sinuses have been removed, the wound may be assessed for closure. While primary closure is the ideal, wound dehiscence is common, even in the absence of tension. If the wound is to be left to heal by second intention, meticulous control of hemorrhage is necessary, as owners are often unable to avoid self-trauma, even if an Elizabethan collar is fitted.

Postoperative care

Dogs are hospitalized overnight in order to watch for postoperative bleeding. Analgesia is maintained for a minimum of 5 days, as is antibiotic cover. Fecal softeners are given until wound healing is complete. If healing is by second intention, this may take up to 6 weeks.

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