Feline Colon Diseases: Understanding the Role of Diet & Drugs in the Management of Colitis & Constipation
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**INTRODUCTION**

Colonic causes of diarrhea in cats are less common, compared to diseases or disorders of the stomach or small intestine. However, constipation, the other major dysfunction of the colon in cats, is a relatively common problem, which has a variety of causes - many of which if identified can be completely resolved. The aim of this review is to discuss the medical and dietary management of chronic diseases of the colon in cats.

**DISEASES CAUSING LARGE-BOWEL DIARRHEA IN CATS**

Diseases of the colon that cause diarrhea are associated with signs of tenesmus, increased mucus in the stool, hematochezia, increased frequency but decreased volume of stool, and generally occur without vomiting or weight loss. However, diarrhea with small-bowel characteristics may occur with inflammatory or infectious diseases that affect both segments of the GI tract. Colitis (e.g., colonic inflammatory bowel disease [IBD]) is the most common diagnosis in cats with chronic large-bowel diarrhea, but dietary intolerance or indiscretion, bacterial, parasitic and neoplastic diseases are also causes of colonic disease that must be considered.

**Colitis**

Inflammatory diseases of the colon are common causes of large-bowel diarrhea, but often a cause is not identified and the diagnosis is based upon histopathologic description. Whether or not a definitive diagnosis is obtained, the end result of inflammatory disease in the colon is a reduction in water and electrolyte absorption and a change in motility that results in an increased frequency and urgency of defecation. Colonic goblet cells are stimulated to increase mucus production, and in severe cases mucosal ulceration occurs, resulting in hematochezia. The most common inflammatory response in colitis is an increase in lymphocytes and plasma cells, and the histologic diagnosis is given as lymphocytic plasmacytic colitis. However, the cellular infiltrate may consist of eosinophils, neutrophils, lymphocytes, plasma cells or macrophages, or a combination of these. The presence of these inflammatory cells in the lamina propria of the colon or small intestine has been termed inflammatory bowel disease (IBD). An accumulation of inflammatory cells in the colon can occur with many different diseases and a diagnosis of IBD should be reserved for those cases where no identifiable cause can be found, and where there is a significant (moderate to severe) accumulation of inflammatory cells in association with epithelial structural changes.

**Lymphocytic Plasmacytic Colitis**

The most common histologic diagnosis in cats with IBD is lymphocytic plasmacytic colitis. Unlike the classic causes of human IBD, ulcerative colitis or Crohn's disease, lymphocytic plasmacytic colitis in cats is rarely
associated with weight loss or ulcerative lesions, and is usually responsive to therapy. Nevertheless, hematochezia, increased mucus in the feces and an increased urgency to defecate are common clinical signs.

In most cases of feline lymphocytic plasmacytic colitis, a combination of dietary and pharmacologic therapy will provide relief from the clinical signs. Dietary therapy can be provided by one of three approaches: 1) feeding a novel-protein (hypoallergenic) diet, 2) feeding a highly digestible diet, or 3) feeding a high-fiber diet. Each of these approaches has merits, but there are no tests or biopsy results that will help determine which dietary approach is likely to be successful. Thus, the rule of thumb is to feed one of the diets for a period of 2 weeks (longer if dietary allergy is suspected due to concurrent vomiting or skin changes), and if a beneficial response is not seen, then it is reasonable to try a diet from the other categories. A dietary trial with a hypoallergenic diet (e.g., novel protein source) is reasonable because of the possible association of colonic IBD with small-bowel IBD or dietary sensitivity. A more commonly recommended strategy for dietary therapy of colitis is to feed a high-fiber diet because of the benefits of increasing luminal short-chain fatty acids (SCFA) concentrations and fecal bulk. Cats may respond favorably to a diet high in insoluble fiber, but if the cat is prone to development of constipation, this may potentially increase the risk of constipation.

Alternatively, adding a smaller amount of fiber to a novel antigen or low-residue diet may be more beneficial or feeding a diet with mixed fiber (containing soluble and insoluble fiber) - two newer diets are available now that may meet these needs: Royal Canin's Fiber Response or Hill's Metabolic diet. Finally, in some cats with colonic disease, a low-residue diet (highly digestible or diet containing highly digestible ingredients) may be the most helpful. The only way to know which of these approaches will be most useful is trial therapy.

There are several medical treatment approaches used in management of lymphoplasmacytic colitis: immunosuppression, anti-inflammatory therapy, and antibacterial therapy. In cats, the most common therapy is prednisolone, either alone or in combination with metronidazole. In the majority of cats, this combination of drugs will reduce the inflammation and control the bacterial disruption. However, in some cats that are unresponsive to prednisolone or have significant prednisolone-associated side effects (e.g., diabetes), sulfasalazine, which is sulfapyridine linked to 5-aminosalicylic acid (5-ASA), may be a reasonable choice. Newer aminosalicylic acid preparations (e.g., mesalamine) are available that allow delivery of 5-ASA without the sulfa moiety, which is believed to be responsible for the numerous adverse effects (keratoconjunctivitis, vomiting) associated with sulfasalazine use. These newer products include oral delayed-release preparations of 5-ASA that prevent its absorption in the upper GI tract (e.g., Pentasa, Asacol, Mesasal, and Rowasa). Because these mesalamine-containing drugs have not been thoroughly evaluated in cats, dosage regimens are empirical.

**Eosinophilic Enterocolitis**

Eosinophilic enterocolitis is characterized by accumulations of eosinophils in the lamina propria and may also be associated with a persistent peripheral eosinophilia as well, especially in cats with hypereosinophilic syndrome. In humans, food allergy has been incriminated in some patients; however, in cats this has not been proven. Sporadic reports have associated the disease with parasites or infectious agents. Nevertheless, while the disease is uncommon compared to lymphocytic plasmacytic colitis, it tends to be clinically more
aggressive, with hematochezia and dyschezia commonly observed. In addition to dietary therapy, treatment of eosinophilic colitis often requires immunosuppressive doses of steroids, alone or in combination therapy with 5-ASA compounds or metronidazole to achieve clinical remission. In humans, efforts to reduce the steroid side effects include using rectal suppositories or enemas containing steroids, other newer glucocorticosteroid preparations which cause fewer systemic side effects (e.g., budesonide). Budesonide (2–3 mg/kg) may be tried in cats requiring long-term steroid therapy to control their disease; however, long-term effects have not been well studied.

**Colonic Diseases Causing Constipation**

Infrequent or difficult evacuation of feces is termed constipation. Obstipation is intractable constipation that is refractory to control or cure, and implies some degree of permanent loss of function. The causes of constipation in the cat are quite numerous, but often relate to inadequate intake of water or dehydration due to other causes resulting in dry feces. In fact, this is the most common reason for cats to become constipated and it is far and away the easiest to recognize and prevent. However, a number of other causes can be involved, including refusal to use the litter box, ingestion of feathers or bones resulting in abnormal stool, an obstructive process in the colon (internal causes include masses or neoplasia, and external causes include pelvic fractures), or ingestion of a high-fiber diet. In every case, an attempt should be made to determine the underlying cause. Either constipation or obstipation may culminate in the recurrent process of colonic dysfunction that results from repeated stretching of the colon. Permanent dilation is the end stage of idiopathic or acquired megacolon (common in cats but rare in dogs) or neurologic dysfunction, whereas hypertrophy develops as a consequence of some obstructive mechanism (intra- or extraluminal). The presence of hardened feces in the colon, termed colonic impaction, is a consequence of prolonged constipation, obstipation, or megacolon, but does not necessarily imply permanent loss of function. Diagnosis of constipation is relatively straightforward; however, functional evaluation of a dilated colon to assess the reversibility of the condition requires anorectal manometry, pelvic floor electromyography, motility assessments, and intestinal transit time tests which are not routinely available.

**Constipation, Obstruction and Megacolon**

Constipation is a problem that is usually easily managed in most cats, but chronic constipation or obstipation are more difficult problems for which the inciting cause must be identified and corrected before treatment will be successful. The initial therapy of constipation is aimed at rehydration of the cat followed by removal of feces from the colon and rectum. In dehydrated animals, rehydration therapy is very important (even essential) to help soften the stool and prevent recurrence. Intravenous fluid therapy is preferred to oral rehydration in most severe cases. Multiple enemas will be required to evacuate the colon in severely constipated or obstipated cats. The type of enema solution varies, but warm water should be used initially. Stool softeners such as MiraLAX are often beneficial and may be added to the enema solution or given orally to help soften the fecal mass. Lactulose is another stool softener that can be used in the same way. Dioctyl sodium sulfo succinate (DSS) is an emollient that can be added to warm water solutions to help soften the stool; however, it must be remembered that DSS is irritating to the colonic epithelium. Enema solutions
should be administered by gravity flow depending on the animal size (in most cats 30–60 ml per dose). Solutions containing soaps or phosphate salts should be avoided due to their irritant or toxic effects. In severe impaction, anesthesia may be necessary to allow the fecal mass to be broken down with gentle digital manipulation.

Dietary management is an important long-term management tool in cats with constipation or obstipation. Increasing fecal bulk with dietary fiber of moderate or poor fermentability stimulates the defecation reflex and shortens transit time in cats with a healthy colon that are well hydrated. As long as the cat is well hydrated, increasing insoluble fiber in the diet is an effective way of moving stool out of the colon. There are many diets containing insoluble fibers (Hill’s w/d, Purina OM, Royal Canin HiFactor) that are designed for this purpose and in animals with normal hydration and a functional colon, these diets work well. However, in many cats (who tend to have too dry feces due to marginal dehydration) these diets may make the problem worse, and can become the cause of recurrent constipation that leads to obstipation and loss of function. In these situations, either the cat must consume more water for the diet to be safe and effective to use, or you must consider other dietary approaches. One approach is to use a diet that is highly digestible (e.g., Hills i/d, Purina EN, Iams low residue) and then add a laxative, colonic prokinetic, or other drug to alter colonic motility as needed. In all cats with severe colonic muscle failure (obstipation or megacolon), high-fiber diets should be avoided completely - and only diets that result in the minimal amount of feces should be used.

The emollient and lubricant laxatives, such as DSS and petroleum jelly, result in a softer stool either via increasing fecal water or by simply lubricating the fecal mass. These laxatives are good for short-term management of mild constipation and in softening a fecal mass that contains hair, bones, etc., but are not effective for therapy of chronic constipation. Osmotic laxatives, such as lactulose or polyethylene glycol-electrolyte (PEG, MiraLAX) solutions, increase intraluminal water content by their osmotic properties. The safety of long-term use of PEG-containing products has not been studied, but if they remain unabsorbed in the feline colon as they are in other species, they should be very safe. Some (lactulose) are also fermented by the colonic microflora (like fermentable fiber), which increases fecal water content. Stimulant laxatives, such as bisacodyl, increase the propulsive contractions of the colon and decrease colonic water absorption. They are very effective laxatives for short-term use, but should not be used if the patient is unable to pass some fecal material. Prokinetic therapy with cisapride or prucalamide will increase colonic smooth muscle contractions, and is especially useful with postoperative ileus, constipation nonresponsive to fiber or laxative supplementation, or in animals without permanent loss of function. In severe cases of obstipation or megacolon that are unresponsive to fiber and drug therapy, a subtotal colectomy may be considered. However, there are many issues of long-term management and potential complications associated with this procedure, and it should only be used as a last resort.

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