ENDOSCOPY OF THE GASTROINTESTINAL TRACT: WHEN IS IT REALLY INDICATED

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Introduction

Endoscopic examination of the upper gastrointestinal tract has been used increasingly as a diagnostic and therapeutic tool in small animal medicine. Easier access to this procedure has led to a marked improvement in the diagnosis of especially chronic gastrointestinal diseases and in the understanding of their pathophysiology. Furthermore, several minimal invasive endoscopic procedures have been introduced and successfully used for therapeutic interventions.

Studies have shown that endoscopy is a useful technique for detecting alterations of the gastrointestinal mucosa when combined with histologic assessment of tissue biopsies (1). The diagnostic value of the endoscopic procedure is dependant on the experience of the investigator and on the quality of the used endoscope and instruments (2). Furthermore, the diagnostic value of endoscopically obtained tissue biopsies depends on their quality. When performing duodenoscopies it has been suggested that, e.g., at least 8 individual tissue pieces should be taken (3).

In recent years, several studies were performed assessing prognostic factors and therapeutic outcome of chronic inflammatory bowel diseases regarding severity of clinical signs, changes of laboratory values, endoscopic gross appearance and histological findings. Study groups have searched for answers to the question what factors predict the treatment response and the final outcome in patients with chronic enteropathies. It has been reported that dogs with chronic enteropathies of different severity did not show changes in the median histologic grade of intestinal biopsy specimens when comparing pre and post-therapeutic samples although a significant clinical improvement was noticed (4). Similar results were published by another research group who assessed the clinical, macroscopic and histopathologic treatment response of dogs with lymphocytic plasmocytic enteritis (LPE). It was noticed that despite improvement of clinical signs and macroscopic findings in endoscopy there were no significant changes in the severity of gastric and duodenal histopathologic lesions (5). A study in 30 dogs that underwent endoscopy due to chronic gastrointestinal disturbances at the University of Giessen, Germany, revealed, that only 10 of 30 patients finally needed medical, mainly immunosuppressive treatment. The other 20 patients showed clinical improvement just by simply changing the diet (6). Concerning the differentiation between inflammation and neoplasia in cats with inflammatory bowel (IBD) disease or alimentary tract lymphoma, it was revealed that endoscopic biopsies were useful to diagnose gastric lymphosarcoma but not adequate for differentiating between IBD and lymphosarcoma in the small intestine. (7)

The results of the mentioned studies pose the question at what point during the diagnostic work up of a gastrointestinal problem endoscopy is really indicated and beneficial for the patient.

Indication for Diagnostic Endoscopy

The aim of diagnostic endoscopy should be to differentiate between inflammation, neoplasia and anomalies such as lymphangiectasia because this differentiation is of influence on prognosis and treatment decisions. It has to be answered what clinical and laboratory parameters and what findings of other imaging techniques predict with highest likelihood that endoscopy reveals a finding that influences prognosis, treatment decision, and outcome.

Clinical signs

Suggested as indications for endoscopy of the upper gastrointestinal tract are regurgitation, esophageal/gastric foreign body, chronic or recurrent vomiting, hematemesis, and chronic or recurrent small intestinal diarrhea with or without weight loss.

Regurgitation, chronic vomiting and hematemesis without evidence of coagulation disorders are clinical signs with a high likelihood of endoscopic findings that influence treatment decisions, prognosis and outcome.

Esophageal diseases such as foreign bodies, esophagitis, strictures, parasitism (*Spirocerca lupis,* endemic areas) and neoplasia are very likely when patients regurgitate and megaesophagus was excluded by radiography. The disorders are easily recognized and partly treatable with endoscopy.

In case of chronic vomiting and hematemesis, the likelihood is high that endoscopy leads to findings that are diagnostic for possibly underlying gastric disorders, such as chronic gastritis of different severity, hypertrophic gastritis, gastric foreign body and neoplasia. However, the evidence for this statement is rather empiric and not supported by larger case studies.

Anorexia, poor initial treatment response and hypoproteinemia were found to be strongly associated with a poor prognosis in dogs with lymphocytic plasmocytic enteritis (8).

Concerning chronic or recurrent diarrhea an important tool for objective assessment of the clinical outcome has become the canine inflammatory bowel activity index (CIBDAI), introduced by Jergens *et al*. (9). It can also be seen as an indicator for the necessity of an endoscopy with small intestinal mucosal biopsy. Initially it has been reported that the CIBDAI correlates well with histology (9). However, recent studies did either not find this correlation (10) or reported improvement of the CIBDAI but not of histological changes during treatment of chronic enteropathies with different treatment regimes (4,5). One study group came to the conclusion that in dogs with IBD of different severity adequate treatment results are achieved when the treatment decision based on a combination of CIBDAI, histopathologic score of mucosal biopsies and the presence of hypoalbuminemia (10). Nevertheless, high CIBDAI scores seem to be rather related with endoscopic findings that influence treatment decision and clinical outcome than low scores.

The observed initial response to treatment can also be seen as an indication for endoscopic examinations (7,8). It has been reported that histological changes were more severe in dogs with chronic gastrointestinal problems that did not respond to a dietary change alone than in dogs with food responsive enteropathy. This poses the question whether dietary management should precede endoscopy when, e.g., 67% of studied cases would have improved also without the procedure (7). In cases where dietary management does not bring improvement, the likelihood seems to be higher that endoscopy might reveal findings that influence the choice of medical interventions such as intensity of immunosuppressive treatment.

Laboratory findings

That can influence the decision about performing an endoscopy are hypoproteinemia/hypoalbuminemia, low serum cobalamin and folate concentrations as well as increases in serum canine C-reactive protein (cCRP) concentrations.

Hypoproteinemia / hypoalbuminemia in connection with primary enteropathies were shown to be associated with a poorer prognosis and the necessity for a more intensive medical treatment (7,8,10). Therefore, low serum protein levels are strong evidence in favor of endoscopy.

Low serum cobalamin values are a sign of longer lasting malabsorption of vitamin B12 for multiple reasons. It can reflect the severity and duration of an enteropathy when exocrine pancreatic insufficiency (EPI) is excluded (11). However, it has to be noticed that cobalamin is absorbed in the terminal ileum that is not reachable by gastroduodenoscopy but by high colonoscopy. Folate is absorbed in the proximal jejunum and low values are rare but seen as a sign of long lasting severe malabsorption (12). Therefore a low serum folate concentration supports the indication for gastroduodenoscopy.

Serum canine CRP concentration was reported to be correlated with the CIBDAI (9) and might therefore be used as an activity marker of chronic enteropathies or as a nonspecific indicator for disease severity and therefore for the necessity of endoscopy.

Non-invasive imaging techniques

Such as radiography and abdominal ultrasound are helpful tools to decide whether endoscopy or diagnostic laparotomy should be chosen as next step of the diagnostic work up. Gastric and esophageal foreign bodies are an indication for endoscopic intervention; intestinal foreign bodies still need a surgical approach.

Marked thickening and irregularity of the gastric or intestinal wall are often associated with neoplastic processes and indicate the need for tissue sampling for histology. For gastric wall abnormalities

endoscopy is the diagnostic tool of choice when ultrasound guided fine needle aspiration for cytology is not diagnostic. Intestinal wall changes should rather undergo laparotomic sampling. It was shown in cats and dogs that full thickness intestinal biopsy reveals better the final diagnosis e.g., for lymphoma than endoscopic tissue sampling (6,13).

A retrospective study about findings in abdominal ultrasound compared with histological findings revealed that hyperechoic mucosal striations in dogs are associated with lacteal dilation frequently associated with mucosal inflammation and protein losing enteropathy (14).

Indications for Therapeutic Endoscopy

Endoscopic therapeutic procedures are indicated when the minimal invasive approach ensures a successful alternative to surgical methods. Possible endoscopic interventions in the upper gastrointestinal tract are removal of foreign bodies out of esophagus and stomach, dilation of esophageal strictures, and placement of tubes for enteral feeding such as percutaneous gastric (PEG) tubes and PEG-jejunal or nasojejunal tubes for postduodenal feeding (2,15). Endoscopic sphincterotomy of the major papilla by retrograde cholangio-pancreatography might be a useful alternative to surgical treatment of extrahepatic biliary obstructions in future (16).

References

1. Roth L, Leib MS, Davenport DJ, Monroe WE. Comparison between endoscopic and histologic evaluation of the gastrointestinal tract in dogs and cats: 75 cases (1984-1987). *J Am Vet Med Assoc* 1990, 196 (4): 635-8
2. Tams TR. *Small Animal Endoscopy.* 2nd ed., Mosby, St. Louis, 1999
3. Willard MD, Lovering SL, Cohen ND, Weeks BR. Quality of tissue specimens obtained endoscopically from the duodenum of dogs and cats. *J Am Vet Med Assoc* 2001; 219(4): 474-9
4. Allenspach K, Steiner JM, Shah BN, *et al*. Evaluation of gastrointestinal permeability and mucosal absorptive capacity in dogs with chronic enteropathy. *Am J Vet Res* 2006; 67 (3): 479-83
5. Garcia-Sancho M, Rodriguez-Franco R, Sainz A, *et al*. Evaluation of clinical, macroscopic, and histopathologic response to treatment in nonhypoproteinemic dogs with lymphocytic-plasmacytic enteritis. *J Vet Intern Med* 2007; 21:11-17
6. Evans SE, Bonczynski JJ, Broussard JD, *et al*. Comparison of endoscopic and full-thickness biopsy specimens for diagnosis of inflammatory bowel disease and alimentary tract lymphoma in cats. *J Am Vet Med Assoc* 2006; 229(9):1447-1450
7. Lenhard T. *Diagnostic value of laboratory parameters for control of treatment success in dogs with chronic gastrointestinal disturbances.* Doctoral thesis. Veterinary Faculty, Justus-Liebig-University, Giessen, Germany, 2007
8. Ohono K, Konishi S, Kobayashi S, *et al*. Prognostic factors associated with survival in dogs with lymphocytic-plasmacytic enteritis. *J Vet Med Sci* 2006; 68(9): 929-33
9. Jergens AE, Schreiner CA, Frank DE, *et al*. A scoring index for disease activity in canine inflammatory bowel disease. *J Vet Intern Med* 2003; 17 (3): 291-7
10. Munster M, Horauf A, Bilzer T. Assessment of disease severity and outcome of dietary, antibiotic, and immunosuppressive interventions by use of canine IBD activity index in 21 dogs with chronic inflammatory bowel disease. *Berl Munch Tierarztl Wochenschr* 2006; 119(11-12): 493-505.
11. Ruaux, C. G. Cobalamin and gastrointestinal disease. *Proceedings of the 20th ACVIM Congress*, Dallas (2002): 500-502.

12. Suchodolski JS, Steiner JM. Laboratory assessment of gastrointestinal function.*Clin Tech Small Anim Pract.* 2003;18(4):203-10.
13. Kleinschmidt S, Meneses F, Nolte I, Hewicker-Trautwein M. Retrospective study on the diagnostic value of full-thickness biopsies from the stomach and intestines of dogs with chronic gastrointestinal disease symptoms. *Vet Pathol.* 2006; 43(6):1000-3.
14. Sutherland-Smith J, Penninck DG, Keating JH, Webster CR. Ultrasonographic intestinal hyperechoic mucosal striations in dogs are associated with lacteal dilation. *Vet Radiol Ultrasound.* 2007;48(1):51-7.
15. Jergens AE, Morrison JA, Miles KG, Silverman WB. Percutaneous endoscopic gastrojejunostomy tube placement in healthy dogs and cats. *J Vet Intern Med* 2007; 21:18-24
16. Spillmann T, Schnell-Kretschmer H, Dick M, *et al*. Endoscopic retrograde cholangio-pancreatography in dogs with chronic gastrointestinal problems. *Vet Radiol Ultrasound* 2005; 46(4):293-9.

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ANOUNCEMENT

9th Convention

9th Annual Convention of Indian Society for Advancement of Canine Practice and International Congress on Canine Practice is being organized on 9th -11th February, 2012 at Bikaner jointly by I.S.A.C.P. and the College of Veterinary & Animal Sciences; Rajasthan University of Veterinary & Animal Sciences, Bikaner. For further details the Organizing Secretary, Dr. Anil Ahuja, H.O.D., Deptt. of Clinical Veterinary Medicine; COVAS, Bikaner – 334 001 Rajasthan, India may be contacted.
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