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ENDOSCOPIC EXAMINATION OF THE ANTERIOR PART OF DIGESTIVE TRACT IN CATS

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ABSTRACT

In case of small animals the endoscopic examination of the digestive tract may apply to the endoscopy of esophagus, stomach and duodenum, which is described as the examination of the anterior part of the digestive tract (panendoscopy), or may be limited to examination of rectum and colon, which is described as endoscopy of the posterior part of the digestive tract. The examination was performed in the 12 cats of European race, various sex, 2-6 years of age and divided into 2 groups. We received some interesting results:

1. Fibroscopy of the anterior part of digestive tract is a safe and very useful diagnostic technique to recognise esophagus, stomach and duodenum illnesses in cats.
2. Olympus XQ 20 pediatric fibroscope can be used in endoscopy of the anterior part of digestive tract in cats.
3. Esophagoscopy might be performed with stiff endoscope, which is of little use in gastroscopy.

Key words: cats, endoscopic examination, digestive tract

INTRODUCTION

Endoscopy is a commonly recognized and very useful diagnostic technique. It is used, among others, in diagnosing the digestive tract ailments - esophagus, stomach, duodenum, rectum and colon, respiratory and genital system, urinary system, motor system and in operative surgery. At present, stiff and flexible endoscopes are used in clinical diagnostics. The latter include fibroscopes and videoendoscopes. Their design is based, to a greater or smaller degree, on the fibre optics technique. Fibroscopes and videoendoscopes are also employed in veterinary medicine, e.g. in examinations of the digestive and respiratory tract in dogs and cats as well as tests of the respiratory tract, esophagus and stomach in horses (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21). In case of small animals the endoscopic examination of the digestive tract may apply to the endoscopy of esophagus, stomach and duodenum, which is described as the examination of the anterior part of the digestive tract (panendoscopy), or may be limited to examination of rectum and colon, which is described as endoscopy of the posterior part of the digestive tract.

Flexible endoscopes of 6-10 (max. 11) mm in diameter, usually 100-110 cm long, are used in endoscopy of the anterior part of digestive tract in cats. It is the diameter of the endoscope which mainly determines its usefulness in endoscopic examination of the digestive tract in this animal species (6,12). The endoscopy of esophagus and rectum can also be performed with stiff optic instruments (6,8,12,20).

Vomiting, swallowing disorders, suspected foreign bodies, esophageal stenoses and diverticuli, bleeding from the anterior part of digestive tract, suspected gastric and duodenal ulceration, and motor disorders (7,8,12,20,21) provide indications for panendoscopy in cats.

Endoscopy of the anterior part of digestive tract should be performed in properly dietetically prepared patients. Some authors recommend 12-24 hour fasting with unrestricted water availability (10). Others recommend at least 12-24 fasting and taking no water for 6-8 hours before endoscopy (7,18). In cases necessitating immediate intervention dietetic preparation shall be omitted (12).

This paper aimed at using and evaluating fibroscopy for diagnosis of the anterior part of the digestive tract in cats.

MATERIALS AND METHODS

The examination was performed in 12 cats of European race, various sex, 2-6 years of age. The cats were divided into 2 groups:

- group I consisted of 6 clinically healthy cats; initial endoscopic examination of the anterior part of digestive tract (esophagoscopy, gastroscopy and duodenoscopy) was performed in this group to allow for elaborating the technique, space orientation in the examined organs and taking biopsy specimens to conduct histologic evaluation. On the basis of the endoscopies of this group we also acquainted ourselves with the picture of healthy organs.

- group II consisted of 6 cats demonstrating symptoms suggesting esophagus, stomach and duodenum disorders, directed to endoscopic laboratory for examination. Radiological examination of the digestive tract was performed in 4 cats before endoscopy. The morphological and biochemical blood examinations were conducted for all cats. The biochemical tests included the following parameters: alanine and aspartate aminotransferase levels, lipase, diastase, urea and alkaline phosphatase; biopsy specimens were taken for histologic evaluation. The biochemical parameters were determined with KODAK EKTACHEM DT 60. The number of white blood cells was determined with a chamber method, red cells - with Pawliński colorimetric method, hemoglobin content - with colorimetric method, and hematocrit value - with microhematocrit method. Biopsy material was fixed in a buffered formalin solution, next dehydrated and paraffin embedded. Serial sections of 5-7 μ m profile were stained with hematoxylin and eosin.

Cats of both groups were clinically examined, paying particular attention to the functions of respiratory and circulatory systems. Information obtained from anamnesis and results of extra blood and radiological tests were analyzed in detail in cats of II group. The patients were qualified for endoscopy basing on these results.

Endoscopy of the anterior part of the digestive tract was performed after a 24-hour fasting; the animals did not drink for 6 hours before the examination. Esophagus, stomach and duodenum endoscopy was performed under complex anesthesia; premedication consisted of xylazine (Proxylaz) in the dose of 1-2 mg/kg of body weight

with ketamine (Bioketan) in the dose of 2 mg/kg of body weight, administered intramuscularly in a single injection. Intravenous Thiopental administered after 10-15 min. pause in the initial dose of 5 mg/kg bodyweight, and then according to its effects, was used for the main anesthesia. Mucous membrane of the pharynx was anesthetized with 5% lignocaine solution.

Spring mouth retractor was put on the canines. During fibroscopic examination a trade mark human protector was put into the mouth. Endoscopy of group I of cats was performed after placing them on the right, and then on the left side; in group II - only on the left side.

Esophagoscopy of group I was conducted with Olympus A5290A stiff endoscope and pediatric fibroscope. Esophagoscopy of group I and gastroscopy and duodenoscopy in both groups was performed with Olympus XQ 20 pediatric fibroscope. Biopsy specimens were taken with FB-25K biopsy forceps through the operating fibroscope canal.

Olympus A5290A stiff endoscope parameters: 0°, operating length - 30 cm, diameter - 5,5 mm. Olympus XQ 20 fibroscope parameters: operating length - 100 cm, diameter - 9,8 mm.

RESULTS AND DISCUSSION

The endoscopies performed in group I and II revealed a necessity of qualifying patients for this examination on grounds of the clinical examination, attaching particular importance to the function of the respiratory and circulatory system, and to the additional test results. Taking the above criteria into account we resigned from endoscopy in case of 2 patients from group II. During clinical examination, the first one was diagnosed with emaciation, pallid-cyanotic coloration of mucous membranes, mixed dyspnea and cardiac disorders. Considering a depressive influence of anesthesia on the respiratory and circulatory system, and a general poor condition of the cat, we decided that in this case endoscopy is imminent with complications or even lethal outcome ([table 1](#) and [2](#), cat no 5). On the basis of the additional laboratory tests the other patient was diagnosed with uremia ([table 1](#) and [2](#), cat no 6).

Table 1. Results of morphological blood tests in cats of group II

No	Leucocytes G/l	Erythrocytes T/l	Hemoglobin mm/l	Hematocrit l/l
1	12.7	8.18	6.8	0.40
2	10.2	6.50	5.1	0.37
3	9.7	7.18	5.9	0.45
4	15.8	7.09	7.8	0.30
5	19.4	4.80	3.4	0.24
6	25.8	6.70	6.4	0.59

Table 2. Results of biochemical blood tests in cats of group II

No	Alanine aminotrans- ferase U/l	Aspartate aminotrans- ferase U/l	Urea Mmol/l	Diastase U/l	Lipase U/l	Alkaline phospha- tase U/l
1	56	42	7.8	837	232	93
2	49	26	6.1	933	187	85
3	24	15	6.0	1032	545	74
4	33	31	7.2	1074	607	104
5	125	38	9.8	598	367	89
6	117	48	23.5	1289	507	98

Esophagoscopies performed in group I proved that the stiff endoscope enables to examine the whole esophagus; yet, in comparison to the fibroscope, endoscopy was more difficult and required far more carefulness. When the stiff optics of the window got soiled with the secretion found in the esophagus, the quality of the whole picture deteriorated. It was often necessary to stop endoscopy, withdraw the endoscope and clean the window, and then

it was put in again. During similar situations in fibroscopy the use of water-air valve caused washing and drying of the window, which solved the problem and allowed for continuation of the examination. The fibroscope, used for the examination, made it possible to explore the whole stomach inside. However, a proper filling of the stomach with air constituted a condition for the detailed macroscopic evaluation. The introduced air straightened gastric folds and exposed the hidden areas. The stiff endoscope made it possible, though to a limited degree, to observe the stomach fundus, and partially, the stomach body. In light of the conducted examinations, this endoscope must be considered as being of little use in gastroscopy. The duodenal fibroscopy created no problems and allowed for the detailed evaluation of its inside. However, stronger or weaker pronounced mechanical injuries of the mucous membrane in cats of both groups were observed, especially while withdrawing the endoscope, located mainly in the first part of duodenum. This must be related to the endoscope diameter. The use of an endoscope of smaller diameter would be most likely to diminish incidence of such injuries.

Dietetic preparation was considered adequate and appropriate. No alimentary content was found in the esophagus, stomach or duodenum of the examined cats. The complex anesthesia used in the examination allowed for performing the endoscopy of the anterior part of digestive tract in all cats during a sufficiently long time. No negative consequences of the anesthesia were observed. The used protection (spring mouth retractor, protector) fully protected the endoscope against biting and made its introduction easier. The gastroscopies performed in group I of cats proved that the positioning of cats on the left side provides better conditions for the observation of the pyloric part and makes the introduction of the fibroscope into duodenum possible.

Taking biopsy specimens from the stomach was fairly easy while filling it with air only to a lesser degree; problems appeared with too intensive filling. Taking the specimens from esophagus and duodenum was difficult as a result of limited mobility of the fibroscope end part in their pipe-like lumen and the tendency of biopsy forceps to slide off the intended biopsy area. The deflexion of the fibroscope end part and taking the specimen in the distance of 1-2 cm from the window made the whole procedure much easier.

Four (4) cats of group, II after endoscopic examination, were diagnosed with: pilobezoars in stomach (1 case) - with negative result of radiological examination and gastritis (3 cases) - confirmed by histopathologic examination of biopsy specimens, with negative results of radiological examination.

Slide description:

Phot. 1. Esophageal lumen in the thoracic segment



Phot. 2. Cardia area



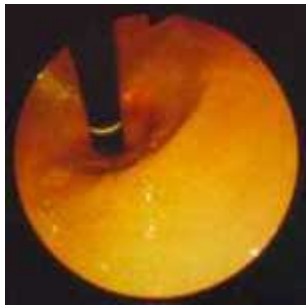
3. End part of the esophagus with open cardia



Phot. 4. Gastric mucosa with visible folds



Phot. 5. Cardia area from stomach side



Phot. 6. Stomach pyloric area



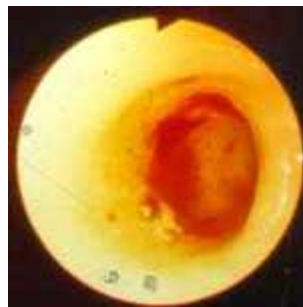
Phot. 7. Stomach pyloric area with visible duodenum entrance



Phot. 8. Duodenal lumen



Phot. 9. Bleeding from duodenal mucosa



CONCLUSIONS

4. Fibroscopy of the anterior part of digestive tract is a safe and very useful diagnostic technique to recognise esophagus, stomach and duodenum illnesses in cats.
5. Olympus XQ 20 pediatric fibroscope can be used in endoscopy of the anterior part of digestive tract in cats.
6. Esophagoscopy might be performed with stiff endoscope, which is of little use in gastroscopy.

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