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ENDOSCOPIC EXAMINATION OF LARYNX, TRACHEA AND BRONCHI IN CATS

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ABSTRACT

The goal of the conducted examination was the application and evaluation of usefulness of endoscopy executed with stiff and flexible endoscopes for diagnosis of larynx, trachea and bronchi diseases in cats. The research included 12 cats of European race, of different sex, and age of 3 –10 years. Basing on the conducted qualification procedures, 2 patients were eliminated from endoscopy. The remaining 10 cats were subject to endoscopic examination of the larynx, trachea and bronchi. The following endoscopes were used for the examination: stiff – Olympus A5290A, Olympus A4672A and flexible – bronchoscope manufactured by Super Vision. During the endoscopic examination 5 cats were diagnosed with chronic bronchitis, 4 with inflammatory lesions of the larynx and trachea and 1 with laryngeal adenoma. Basing on the conducted examination it was demonstrated that endoscopy of the larynx, trachea and bronchi is a useful diagnostic procedure while diagnosing diseases of these organs in cats. Laryngotracheoscopy can be conducted with stiff and flexible optics as well. Only flexible endoscopes can be used for bronchoscopy.

Key words: cat, respiratory system endoscopy.

INTRODUCTION

Endoscopy of the respiratory system is a very useful diagnostic procedure in diagnosis of nasal cavities, larynx, trachea and bronchi in humans as well as in animals. Apart from the direct observation of the organ inside, the examination enables taking material for further laboratory tests such as: cytological, microbiological and histological ones. The material most frequently consists of secretion and tissue fragment (bioptate). Quite

frequently, the respiratory system endoscopy is also of a therapeutic character, consisting in removing the aspired foreign bodies, which are usually located in nasal cavities and bronchial tree [1, 2, 4, 5].

In veterinary medicine, both flexible and stiff endoscopes are used for the endoscopic examination of the respiratory system. The size of the animal and of the examined system have a decisive influence on the parameters and, through this, on the usefulness of the optics used for respiratory system endoscopy in particular species, races and age of animals.

The most frequent indications for laryngotracheobronchoscopy are the following: cough persisting for over 3 weeks, accelerated breathing rate and dyspnoea of various degree, change of voice or its total loss, pain around the larynx and trachea, suspicion of functional disorders of the larynx, suspicion of foreign bodies, acute attacks of respiratory insufficiency of unexplained etiology as well as pneumonia and bronchitis difficult for treatment [3, 4].

The goal of the conducted examination was the application and evaluation of usefulness of endoscopy executed with stiff and flexible endoscopes for the diagnosis of larynx, trachea and bronchi diseases in cats.

MATERIAL AND METHODS

The research included 12 cats of European race, different sex, and age of 3–10 years, patients of the Clinic with respiratory symptoms, referred to the endoscopy laboratory for endoscopy of the upper and lower airways.
The cats were qualified for endoscopy basing on the patients history, clinical examination and the results of the conducted additional examinations: RTG of the upper and lower airways, blood test (hematological and biochemical one). The biochemical profile considered alanine and aspartate aminotransferase activity as well as alkaline phosphatase activity, and the urea and creatinine levels. The qualification procedure aimed at the evaluation of the present state of the animal and elimination of the patients of the so-called “risk group”.

24-hour fasting and 6-hour limitation of liquid supply were prescribed before the endoscopy. The endoscopy was conducted under general anesthesia, with the administration of xilasine in the dose of 1-2 mg/kg of body mass together with ketamine in the dose of 10-15 mg/kg of body mass in one intramuscular injection. The mucous membrane of the throat and larynx was anesthetized with 2% lignocaine. The examination was conducted with patients placed on their left side.

The following endoscopes were used for the examination: stiff – Olympus A5290A, Olympus A4672A and flexible – bronchoscope manufactured by Super Vision. Parameters of the used optics: Olympus A5290A – working length 30 cm, diameter 5.5 mm; Olympus A4672A – working length 28 cm, diameter 3 mm; bronchoscope Super Vision - working length 60 cm, diameter 5 mm.

In case of 5 cats which were diagnosed with bronchitis during endoscopy, secretion for microbiological test was taken with cannula, and cytological swabs were taken with a brush (photo 2). The cytological swabs were taken from 4 cats diagnosed with laryngitis and trachitis (photo 4). In case of 1 cat, material for histopathological test was taken with biopsy forceps.

The cytological material was put onto object glass, a smear was prepared and then fixed and colored with hematoxylin and eosin or with Hemacolor method.

The collected bioptates were fixed in 5% buffer solution of formalin and sent to the histopathological laboratory.

RESULTS AND DISCUSSION

Basing on the conducted qualification procedure, 2 patients were eliminated from endoscopy. Emaciation, pallor of mucous membranes, lowered internal temperature and abnormalities in hematological tests were found in 1 cat, especially concerning the red cell system: (E – 4,3 T/l, Ht – 0,18 l/l, Hb – 4,1 mmol/l). The other cat, after the conducted history-taking and clinical examination, was referred to radiological laboratory, where it was diagnosed with diaphragmatic hernia. In the first case the cat belonged to a group of the so-called “risk patients”, where the possibility of complications during the examination is very high. In the other case, the diagnosis was made basing on radiological examination. The remaining 10 patients were qualified for endoscopy.

It was observed during endoscopy that stiff endoscopes make it possible to view the inside of larynx, trachea and tracheal bifurcation. Endoscopy of bronchial tree with the use of such optics was impossible. Olympus A4672A

endoscope was used in case of deformative lesions within larynx. Its smaller diameter enabled safe penetration, however the field of vision was smaller. Olympus A5290A endoscope, with a larger field of vision, could not be used in this situation because of too big diameter.

Fiberoscopy conducted with Super Vision bronchoscope enabled, apart from endoscopy of the larynx and trachea, also the endoscopy of bronchial tree. Its movable end-piece facilitated examination, and - with the aid of manipulators inserted through the working canal - precise collection of material for further tests (secretion, cytological swabs) was conducted. Material taking was also possible with the use of stiff optics, which had no working canal. The manipulators used in such a case – cytological brushes and cannulas – were inserted independently into the respiratory system, and their position in the microscope eyepiece was observed. However, cytological material collected in this way was unreliable since it was additionally polluted inside throat and mouth.

During the endoscopic examination, 5 cats were diagnosed with chronic bronchitis. RTG examination conducted prior to endoscopy yielded a positive result in 4 cases and a doubtful result in 1 case. The type of infection was determined in the secretion from bronchial tree taken in the microbiological laboratory, and antibiogram was made on the basis of which the directed antibiotic therapy started. Inflammatory cell infiltration, consisting mainly in neutrophils and macrophagi, was found during microscopic examination of cytological preparations.

Inflammatory lesions of the larynx and trachea were found during endoscopy, which was confirmed by cytological tests (photo 1, 3). The previous radiological examinations were negative.

In case of 1 cat with a deformative lesion of the laryngeal area, on the basis of the histopathological examination of bioptates taken from this area, laryngeal adenoma was diagnosed, originating from the larynx mucous membrane glands (photo 5).

Photo 1. Laryngitis. Visible: mucous membrane edema, erosion and large amount of mucous-purulent secretion

Photo 2. Collection of cell material with the aid of cytological brush

Photo 3. Swab from the larynx mucous membrane. Neutrophils, monocytes with kidney shaped nucleus, single macrofagi and epithelial cells can be seen. Hemacolor staining, magnification 400x

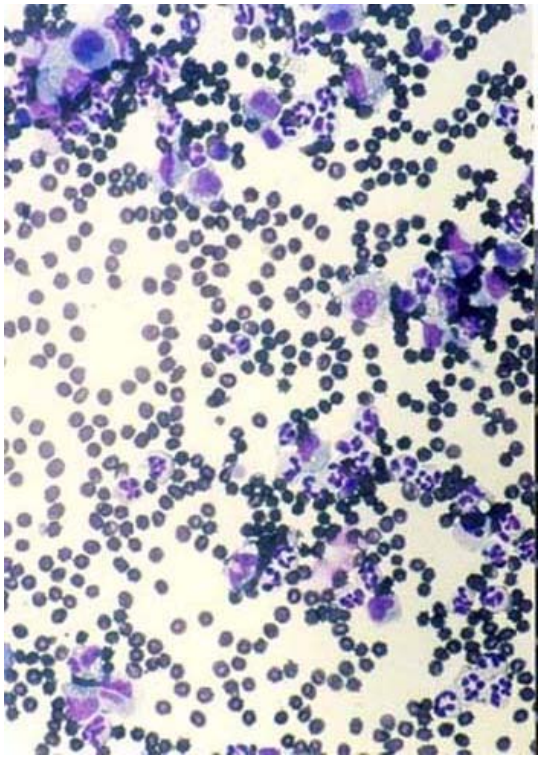


Photo 4. Swab from cats trachea bifurcation. Very numerous neutrophils and numerous eosinophilic mucus streaks visible. Hemacolor staining, magnification 200x

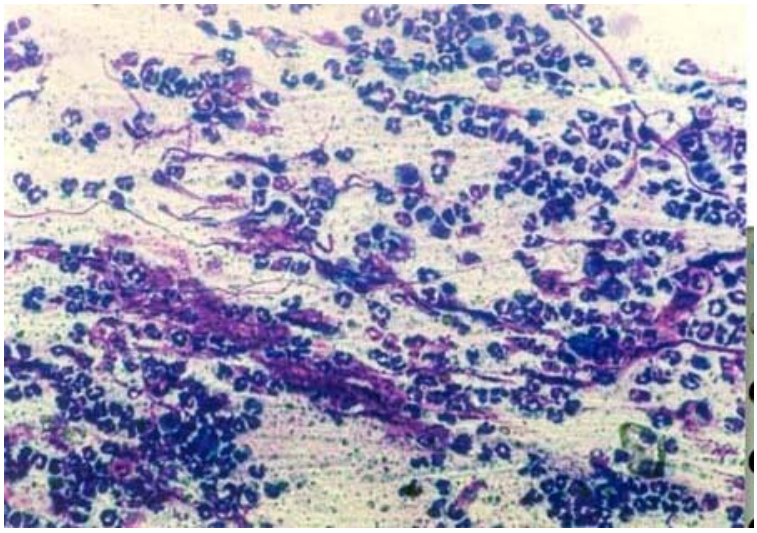
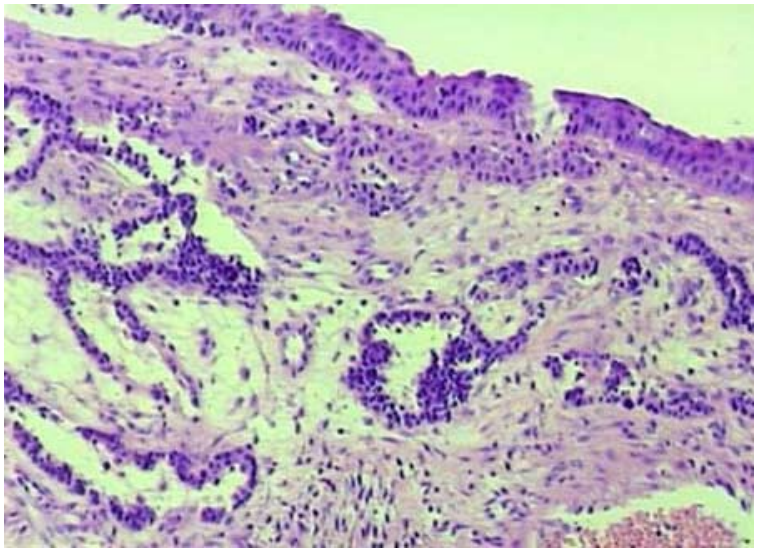


Photo 5. Adenoma originating from the cats larynx mucous membrane glands. HE staining, magnification 100x



CONCLUSIONS

1. Endoscopy of larynx, trachea and bronchi is a useful diagnostic procedure in the diagnosis of these organs in cats, while the possibility of taking material for further tests still increases its diagnostic value.
2. Laryngotracheoscopy can be conducted with stiff as well as flexible optics, while only flexible endoscopes can be used for bronchoscopy.
3. The qualification procedure for endoscopy presented in this work is fully justified because it eliminates patients in which the risk of complications during and after endoscopy is high.
4. Dietetic preparation applied before endoscopy is proper, and the general anesthesia is safe for the patient and sufficient to conduct laryngotracheobronchoscopy in cats.

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