

CASE REPORT: MANAGEMENT OF BRONCHITIS, SCABIOSIS, AND LICE INFESTATION IN A DOMESTIC CAT

Laporan Kasus: Penanganan Bronkitis, Skabiosis, dan Infestasi Kutu pada Kucing Domestik

Putri Utami^{1*}, Sri Kayati Widyastuti², I Gusti Made Krisna Erawan²

¹Veterinary Medicine Professional Education Program, Faculty of Veterinary Medicine, Udayana University, Jl. PB. Sudirman, Denpasar, Bali 80234, Indonesia

²Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Jl. PB. Sudirman, Denpasar, Bali 80234, Indonesia

*Corresponding author email: putriutami2208@student.unud.ac.id

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Abstract

Bronchitis is an inflammation of the bronchus. Scabiosis and flea infestations weaken the immune system, cause physiological stress, and increase the risk of secondary infections. This case report describes the management of a 4-year-old male domestic cat that presented with cough, sneezing, mucopurulent nasal discharge, and severe pruritus accompanied by alopecia and skin ulcers. Physical examination revealed a heart rate of 144 beats/min and a pulse rate of 140 beats/min, indicating tachycardia, and the gingival mucosa appeared pale. Radiological and hematological examinations revealed a bronchial pattern on chest radiography, leukocytosis, and lymphocytosis, while skin examination revealed infestations with *Notoedres cati* and *Felicola subrostratus*. The cat was diagnosed with bronchitis, scabies, and flea infestation. Treatment consisted of salbutamol sulfate nebulization at a dose of 0.1 mg/kg body weight mixed with 2 mL of 0.9% sodium chloride, administered twice daily for 7 days; amoxicillin-clavulanate at a dose of 25 mg/kg body weight for 7 days; and anti-inflammatory methylprednisolone at a dose of 0.4 mg/kg body weight for 5 days. For scabies, treatment was administered using spot-on antiparasitic drops containing selamectin and sarolaner (Revolution Plus® for Cats Orange 5.6–11 lbs), and the spot-on antiparasitic drops were reapplied after 5 weeks. By day 7, the cat's physical condition had improved; there were no symptoms of sneezing or nasal discharge, the frequency of coughing had decreased, and hair regrowth was evident; therefore, the cat was discharged.

Keywords: *Felicola subrostratus*, inflammatory of bronchi, *Notoedres cati*, scabiosis

Abstrak

Bronkitis merupakan peradangan yang terjadi pada daerah bronkus. Skabiosis dan infestasi kutu akan menurunkan daya tahan tubuh, menyebabkan stres fisiologis, serta mempermudah terjadinya infeksi sekunder. Laporan kasus ini menggambarkan penanganan seekor kucing domestik jantan berusia 4 tahun dengan gejala batuk, bersin, leleran mukopurulen pada hidung, serta pruritus berat disertai adanya alopesia dan ulcer pada kulit. Pemeriksaan fisik menunjukkan frekuensi jantung sebanyak 144 kali/menit dan frekuensi pulsus sebanyak 140 kali/menit yang menandakan bahwa adanya peningkatan, serta mukosa gingiva terlihat pucat. Pemeriksaan radiologi dan hematologi menunjukkan adanya pola bronkial pada radiografi thoraks, leukositosis dan limfositosis, serta pemeriksaan kulit menunjukkan adanya infestasi *Notoedres cati* dan *Felicola subrostratus*. Kucing kasus didiagnosis menderita bronkitis, skabiosis, dan infestasi kutu. Penanganan dilakukan dengan nebulisasi salbutamol sulfate dengan dosis 0,1 mg/kg BB yang dicampur dengan sodium chloride 0,9% sebanyak 2 mL yang dilakukan 2 kali sehari selama 7 hari, amoxicillin-clavulanat dengan dosis 25 mg/kg BB selama 7 hari, antiinflamasi methylprednisolone dengan dosis 0,4 mg/kg BB selama 5 hari. Untuk skabiosis dilakukan penanganan dengan pemberian antiparasit tetes *spot-on* yang mengandung selamectin dan sarolaner (Revolution Plus® for Cats Orange 5.6-11 Lbs) dan dilakukan pengulangan pemberian antiparasit tetes *spot-on* setelah 5 minggu. Pada hari ke-7 kondisi fisik kucing menunjukkan pemulihan dimana tidak ada gejala bersin dan leleran pada hidung, frekuensi batuk berkurang, serta adanya pertumbuhan rambut, sehingga kucing diperbolehkan untuk pulang.

Kata kunci: *Felicola subrostratus*, *Notoedres cati*, peradangan bronkus, skabiosis

INTRODUCTION

Cats are highly susceptible to diseases, especially when environmental conditions and care management are suboptimal. A polluted environment can increase the exposure of the respiratory tract to various irritants, such as smoke, dust, gases, disinfectants, and other chemical compounds. In addition, the respiratory tract of cats is vulnerable to infection by various pathogens, including bacteria, viruses, parasites, and fungi. Physical trauma, such as traffic accidents or impacts, can cause lung abnormalities. These conditions can trigger an inflammatory response in the respiratory tract, manifesting as chronic bronchitis (Barchilon and Reiner, 2023).

Bronchitis is an inflammatory condition of the bronchi that can be triggered by infectious agents, such as viruses, bacteria, and fungi. Cats with bronchitis typically exhibit respiratory symptoms, such as sneezing, coughing, fever, and a runny nose (Putra *et al.*, 2023). Bronchitis can be classified into two types: acute and chronic. Chronic bronchitis is characterized by persistent inflammation of the lower respiratory tract and neutrophil infiltration in the bronchi. Clinically, this condition is characterized by a cough lasting at least two months or longer (Rozanski, 2014). Cats with chronic bronchitis typically breathe with their mouths open during stressful situations. Trauma and poor environmental conditions may play a role in the pathogenesis of chronic bronchitis in cats (Lappin, 2018).

Bronchitis may occur alongside other conditions, such as skin diseases, which contribute to weakened immune systems. Infections caused by ectoparasites disrupt the body's natural defense mechanisms and alter the balance of the microbial community, making cats more susceptible to other pathogenic infections, including respiratory infections (Arnold *et al.*, 2022). Scabies, a mite infestation, is a common skin disease in cats. Scabies is caused by *Sarcoptes scabiei* or *Notoedres cati*. In scabies, female mites burrow into the superficial layer of the epidermis to live and lay eggs. This activity triggers an inflammatory response, causing

severe pruritus accompanied by skin thickening, crust formation and alopecia (Fatma *et al.*, 2021). In addition, infestations by biting lice, such as *Felicola subrostratus*, can worsen the clinical condition by causing skin irritation, dull coat, and secondary infections (Abdillah *et al.*, 2024). These conditions weaken the immune system, cause physiological stress, and increase susceptibility to secondary infections. Furthermore, an unhygienic environment and a weakened immune system in animals with scabies can worsen their clinical condition.

Based on the background described above, this case report presents a patient with bronchitis complicated by scabies and lice infestation, with the aim of describing the management of chronic bronchitis through symptomatic therapy involving nebulization and the treatment of scabies and lice infestation.

RESEARCH METHODS

Clinical Presentation

The cat in the present case was a 4-year-old male domestic cat weighing 2.65 kg. The cat had gray-black fur, as shown in Figure 1.

Medical History

The cat in the present case was rescued by its owner approximately 2 years prior to the examination. The owner reported that the cat had been coughing, sneezing, and exhibiting yellow nasal discharge for 2 weeks prior to the examination. The cat also experienced itching and frequently scratched itself. The cat was fed dry food or, occasionally, rice and fish, and water was provided *ad libitum* (at pleasure). The cats were allowed to roam freely in the vicinity of their homes. The cat had never been treated, vaccinated, or dewormed.

Physical Examination

A physical examination was performed on all systems of the affected cat, with a particular focus on the integumentary and respiratory systems.

Supportive Tests

Supportive tests conducted to aid in establishing the diagnosis included radiography, cytology, hematology, skin scraping, and trichography.

Radiographic (X-Ray) Examination

Radiographic examinations were performed at the Udayana University Veterinary Teaching Hospital. Thoracic X-rays were taken in the right lateral and ventrodorsal positions with beam settings of 55 kilovolts (kV) and 3 milliamperes-seconds (mAs).

Cytological Examination

Cytological examination was performed by collecting a sample of nasal discharge from the affected cat using a sterile cotton swab, and the sample was then prepared and stained using the Diff-Quik staining method (PT. Mora Anugrah Berkas, Tangerang-Banten, Indonesia).

Routine Hematology Examination

Routine hematology testing of the cat blood samples was performed using an automatic hematology analyzer at the Udayana University Veterinary Teaching Hospital.

Skin Scraping Examination

Skin scraping samples were collected using the superficial skin scraping method at the Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana

University, Bali, Indonesia. The samples were placed on a microscope slide, treated with 10% KOH solution, and covered with a coverslip (Foley *et al.*, 2016).

Trichogram or Hair Pluck Examination

Hair samples were collected from the dandruff-affected area on the back using a needle holder to avoid contamination. The hair samples were then placed on a microscope slide, treated with 10% KOH, and covered with a coverslip. The samples were examined under a microscope at 100 × magnification (Hnilica and Petterson, 2017).

RESULTS AND DISCUSSION

Physical Examination

The results of the current status examination showed a heart rate of 144 beats per minute, a pulse rate of 140 beats per minute, a respiratory rate of 16 breaths per minute, a body temperature of 38.8 °C, a capillary refill time (CRT) of < 2 s, and normal skin turgor. The nutritional status or body condition score (3/9) was based on the Royal Canin guidelines (2026); the cat had a calm temperament but frequently scratched and sneezed.

Other examination findings revealed a dull coat that felt gritty, crusts on the chest, alopecia on the neck, front legs, and hind legs, thickening of the skin on the front legs and face, and ulcers on the neck. The gingival mucosa was pale in color. The cat was sneezing and coughing, and mucopurulent discharge was observed in its nose.

Radiographic (X-Ray) Examination

The radiographic examination of the cat in this case revealed a bronchial pattern (Figure 2) in both the left and right lungs. The bronchial pattern arises from the thickening of the bronchial walls caused by inflammatory cell infiltration or fluid accumulation around the bronchi. Thickening of these structures results in increased radiographic opacities in the bronchi or bronchioles (Putra *et al.*, 2023).

Cytological Examination

Cytological examination revealed a predominance of neutrophil infiltration and the presence of bacteria (Figure 3).

Routine Hematology Examination

The results of routine hematological examinations are presented in Table 1. The results indicated that the animals exhibited leukocytosis and lymphocytosis.

Skin Scraping Examination

During superficial skin scraping examination of the affected cat, mites were found with a round body shape and four pairs of legs, with the two posterior pairs not extending beyond the body outline. The mites found were smaller than *Sarcoptes scabiei*. According to Foley *et al.* (2016), mites with these characteristics are *Notoedres cati* mites, as shown in Figure 4.

Trichogram or Hair Pluck Examination

A trichogram revealed fleas with a dorsoventrally flattened body, triangular head tapering toward the front of the body, yellowish-brown color, and three pairs of short legs. According to Colella *et al.* (2020), fleas with these characteristics are *Felicola subrostratus*, as shown in Figure 4.

Diagnosis and Prognosis

Based on the clinical signs, medical history, physical examination findings, and supportive tests, the cat was diagnosed with bronchitis, scabies, and flea infestation with a favorable prognosis.

Treatment

The treatment administered to the cat in this case to manage bronchitis consisted of nebulization with salbutamol sulfate (Ventolin Nebules®, PT. Glaxo Wellcome Indonesia, Jakarta, Indonesia) at a dose of 0.1 mg/kg body weight, mixed with 2 mL of 0.9% sodium chloride, administered twice daily for 7 days. The antibiotic amoxicillin-clavulanate at a dose of 25 mg/kg body weight was administered orally (PO) twice daily for 7 days, and the anti-inflammatory drug methylprednisolone was administered orally (PO) at a dose of 0.4 mg/kg body weight once daily for 5 days. Scabies and flea infestations were treated with spot-on antiparasitic drops containing selamectin and sarolaner (Revolution Plus® for Cats Orange 5.6–11 lbs, Zoetis Inc., South Jakarta, Indonesia). Repeat administration of the spot-on antiparasitic treatment was performed 5 weeks after the first treatment was administered (Becskei *et al.*, 2017).

Evaluation

The progression of the healing process is shown in Figure 5. The cat's condition appeared to improve on the third day, as indicated by a reduction in the intensity of scratching and a decrease in the frequency of coughing, although mucopurulent discharge was still present, and skin irritation was observed on the nose (Figure 5A). On the fifth day of treatment, hair growth became visible, nasal discharge began to turn serous, and sneezing still occurred occasionally (Figure 5B). On the seventh day, the cat showed no signs of sneezing or nasal discharge, the frequency of coughing had decreased, and hair regrowth was evident (Figure 5C). The cat was discharged on the seventh day because its physical condition improved and its appetite began to increase.

Discussion

The cat in this case exhibited coughing, sneezing, and mucopurulent discharge. According to Suartha (2021), coughing can result from the body's normal defense reflex to expel foreign objects from the respiratory tract and is triggered by irritation of the respiratory tract. Mucopurulent or purulent discharge raises suspicion of a secondary or primary bacterial infection that triggers increased mucus production due to the infiltration of inflammatory cells as part of the body immune response (Johnson *et al.*, 2005). Nasal swab examination revealed the presence of inflammatory cells (neutrophils) and bacillus-shaped bacteria. Blood test results for the cat in this case showed leukocytosis and lymphocytosis. An increased white blood cell count indicates an immune response to ongoing infection or inflammatory processes. Lymphocytosis is caused by antigen stimulation, which triggers lymphocyte proliferation as part of the body's immune system. It is also influenced by physiological factors (stress response) and chronic inflammatory processes (Siswanto, 2017).

Chest radiography revealed increased radiopaque opacity, appearing as ring-shaped white patches in the lung fields. This is likely due to the widespread inflammation of the lung parenchyma and bronchioles (Kumrow and Rozanski, 2012). The bronchial pattern observed on radiography indicates inflammation in the bronchi. Cytological results revealed the presence of bacteria that may play a role in the development of bronchitis. These findings indicate an inflammatory process accompanied by infection in the lower respiratory tract.

In addition to showing signs of respiratory distress, the affected cat experienced itching and frequent scratching. Physical examination revealed a dull coat, crusts, and thickening of the skin on the face and front legs. These clinical signs indicated that the cat had scabies. This is consistent with the findings of Scott *et al.* (2001), who noted that cats with scabies typically exhibit skin thickening and develop pathological conditions, such as crusts, that cause itching in areas such as the ears, head, legs, and tail. Superficial skin scraping revealed the presence of *Notoedres cati*, the mite responsible for scabies. A dull coat and pruritus may be caused by infestation with the biting louse *Felicola subrostratus*, which feeds on debris from the epidermis and hair, potentially leading to clinical signs such as a dull coat, crusts, pruritus, and alopecia (Abdillah *et al.*, 2024). Trichogram examination revealed the presence of *Felicola subrostratus* in the animal's hair. This finding is consistent with the medical history, which indicated that the cat roamed freely in the neighborhood, thereby increasing the risk of exposure to and infestation by ectoparasites, including fleas.

The treatment for bronchitis involves nebulization therapy with salbutamol sulfate mixed with 0.9% sodium chloride. According to Santosa *et al.* (2004), the administration of salbutamol sulfate, a selective β_2 -adrenoceptor stimulant, can cause the smooth muscles of the bronchi to relax (bronchodilation), thereby improving airflow in the respiratory tract. The antibiotic amoxicillin-clavulanate was administered to treat secondary infections. The combination of amoxicillin and clavulanic acid broadens the spectrum of antimicrobial activity against beta-lactamase-producing bacteria (Allerton, 2020). The use of antibiotics in this case was based on the detection of bacteria in the cytology test results. The administration of the corticosteroid methylprednisolone aims to prevent or stop the production of substances in the body that can cause inflammation, pain, or swelling (Putra *et al.*, 2023).

Scabies and flea infestations are treated with spot-on antiparasitic treatments containing selamectin and sarolaner. Treatment with selamectin and sarolaner administered via spot-on application provides effective protection against parasites for one month and kills fleas within 12 h of application. Animals should not be bathed for 48 h after the application of flea treatment to ensure that the active ingredients remain undiluted and the medication remains effective. A repeat application of the spot-on antiparasitic treatment should be administered five weeks after the first treatment (Becskei *et al.*, 2017).

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the medical history, physical examination findings, and ancillary tests, the cat in this case was diagnosed with bronchitis, scabies, and flea infestation. The treatment administered, including bronchodilators, antibiotics, anti-inflammatory medications, and spot-on antiparasitic drops for the treatment of scabies and flea infestation, yielded positive results. On day 7, the cat showed clinical improvement and was discharged in stable condition.

Suggestions

The owner is advised to maintain a clean environment for the cat and take the cat to the veterinarian for regular checkups to ensure the cat's continued good health.

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Table

Table 1. Complete blood count results.

Parameter	Value	References
White Blood Cell (10^3 /uL)	33,69 ↑	5.5-19.5
Lymphocyte Count (10^3 /uL)	20,14 ↑	0,8-7
Midle Count (10^3 /uL)	3,77 ↑	0-1,9
Granulocytes Percentage (10^3 /uL)	9,78	2,1-15
Lymphocyte Percentage (%)	59,8 ↑	12-45
Midle Percentage (%)	11,2 ↑	2-9
Granulocytes Percentage (%)	29 ↓	35-85
Red Blood Cell (10^6 /uL)	6,67	4,6-10
Haemoglobin (g/dL)	14,2	9,3-15,3
Mean Corpuscular Hemoglobin Concentration (g/dL)	32,8	30-38
Mean Corpuscular Hemoglobin (pg)	21,3 ↑	13-21
Mean Corpuscular Volume (fL)	65 ↑	39-52
Red Cell Distribution Width Coefficient of Variation (%)	12 ↓	14-18
Red Cell Distribution Width Standard Deviation (fL)	37,3	35-56
Haematocrit (%)	43,3	28-49
Platelet Count (10^3 /uL)	128	100-514
Mean Platelet Volume (fL)	8	5-11,8
Platelet Distribution Width (fL)	9,9 ↓	10-18
Plateletcrit (%)	1,103	0,1-0,5
Platelet Large Cell Ratio (%)	20,4	13-43

Note: ↓= decrease; ↑= increase

Figure

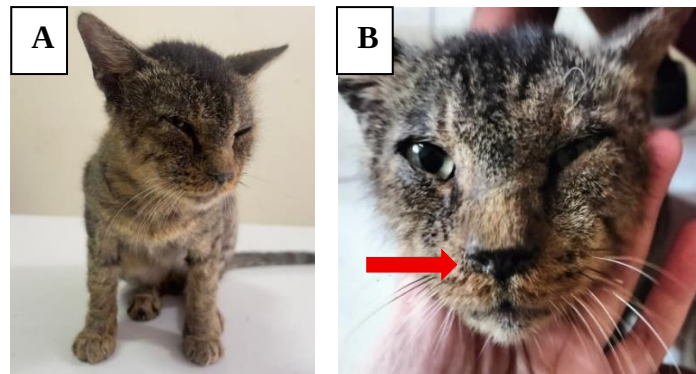


Figure 1. (A) Clinical condition of the case cat during examination; (B) Nasal discharge indicated by the red arrow.

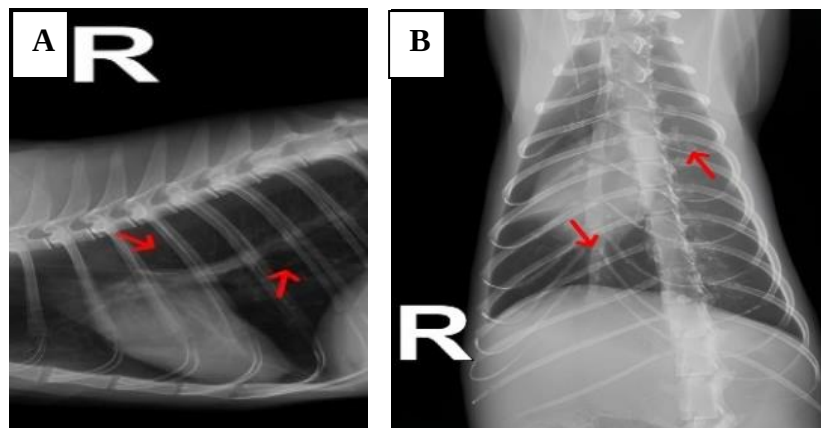


Figure 2. Radiographic findings with red arrows indicating a bronchial pattern: (A) lateral radiograph; (B) ventrodorsal radiograph

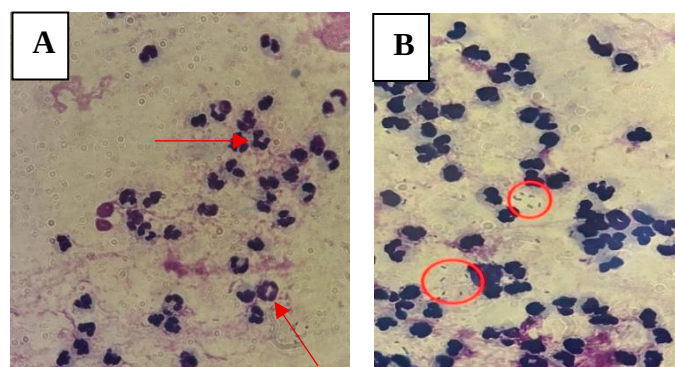


Figure 3. (A) Neutrophil (red arrow); (B) rod-shaped bacteria (red circle) from nasal swab examination.

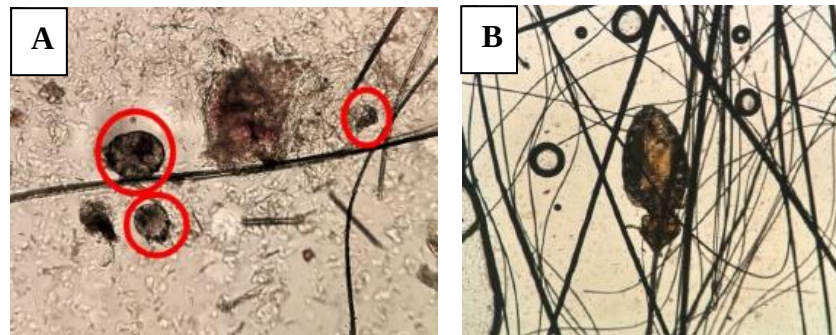


Figure 4. (A) *Notoedres cati* mite (red circle) from superficial skin scraping; (B) louse (*Felicola subrostratus*) from trichogram examination.

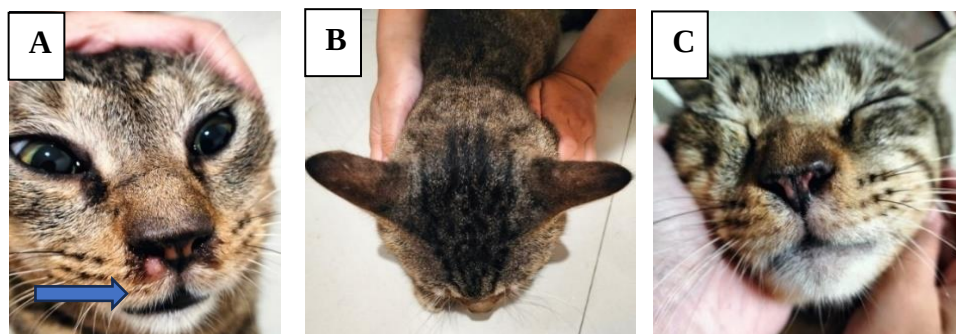


Figure 5. (A) Condition of the cat on day 3, with the blue arrow indicating skin irritation; (B) Day 5 showing hair regrowth; (C) Day 7 post-treatment showing the absence of nasal discharge.