Severe Regenerative Anemia Associated with *Mycoplasma haemofelis* Infection in a Stray Cat: A Clinical Case Report

Abstract

Background: Severe regenerative anemia in cats is commonly associated with infectious agents affecting erythrocytes, particularly hemotropic mycoplasmas, which remain an important but often underrecognized cause of systemic illness in stray populations. Diagnosis is often challenging due to nonspecific clinical signs and overlapping presentations with other infectious or inflammatory diseases, emphasizing the importance of accurate and timely diagnostic approaches. **Case Description**: A 3.1 kg intact stray domestic shorthair cat was presented with lethargy, anorexia, intermittent fever, and persistent upper respiratory signs following a history of cat fighting and abscess formation. Physical examination revealed poor body condition, pale mucous membranes, and heavy ectoparasite infestation with *Ctenocephalides felis.* Serial hematological evaluations demonstrated severe regenerative anemia accompanied by leukocytosis and inflammatory leukogram changes, while serum biochemical analysis indicated mild hyperbilirubinemia and hyperglobulinemia consistent with hemolysis and chronic inflammation. Thoracic radiography showed no significant cardiopulmonary abnormalities. **Results**: Molecular diagnostic testing using polymerase chain reaction (PCR) confirmed *Mycoplasma haemofelis* infection, while *feline immunodeficiency virus* (FIV), *feline leukemia virus* (FeLV), *feline herpesvirus-1, feline calicivirus, Bordetella bronchiseptica*, and *Chlamydia felis* were not detected. Despite supportive and antimicrobial therapy during hospitalization, clinical improvement remained limited, and further monitoring could not be continued after the owner elected to discontinue inpatient care. **Conclusion**: This case highlights the importance of considering hemotropic mycoplasma infection as a differential diagnosis in stray cats with severe regenerative anemia and systemic illness, and emphasizes the role of early molecular diagnostics and comprehensive clinical evaluation in improving clinical decision-making and case management outcomes.

Key words: Feline hemoplasmosis, *Mycoplasma haemofelis*, PCR, regenerative anemia, stray cat.

1. Introduction

Feline anemia is a frequently encountered hematological abnormality in veterinary practice and may arise from blood loss, decreased erythropoiesis, or hemolytic processes. Infectious causes represent an important component of regenerative anemia in cats, particularly infections caused by hemotropic mycoplasmas, which have been reported worldwide with varying prevalence depending on geographic region, diagnostic methods, and cat management practices [1]. These cell wall-deficient, epierythrocytic bacteria attach to the surface of red blood cells and can induce a spectrum of clinical outcomes ranging from subclinical infection to severe hemolytic anemia [2]. Recent advances in hematology emphasize the importance of differentiating regenerative and non-regenerative anemia using reticulocyte indices and inflammatory response markers in cats and dogs, which improves diagnostic interpretation in hemolytic conditions [3]

Among feline hemoplasma species, *Mycoplasma haemofelis* is recognized as the most pathogenic organism and has been associated with fever, lethargy, pallor, and regenerative anemia. Transmission is commonly linked to ectoparasites, blood exposure, and aggressive interactions between cats, particularly in free-roaming or stray populations [4]. Hematological alterations frequently include decreased hematocrit, erythrocyte destruction, and inflammatory leukogram changes, reflecting systemic involvement during infection.

Diagnosis of hemoplasmosis remains challenging due to nonspecific clinical manifestations and the intermittent presence of organisms in peripheral blood smears. Consequently, molecular techniques such as polymerase chain reaction (PCR) are considered more reliable for confirming infection and improving epidemiological understanding [1,4]. Accurate diagnosis is essential to differentiate hemoplasmosis from other

systemic conditions presenting with anemia and chronic illness. Hemotropic mycoplasma infections have also been widely reported in domestic animals, particularly in association with ectoparasite exposure, highlighting the role of vector-borne transmission in clinical epidemiology [5].

Despite increasing global recognition of feline hemoplasma infections, detailed clinical reports describing severe regenerative anemia associated with *Mycoplasma haemofelis* in stray cats remain limited. Therefore, this clinical case report aims to describe the clinical presentation, diagnostic findings, and management of a stray cat diagnosed with severe regenerative anemia associated with *Mycoplasma haemofelis* infection.

2. Case Presentation

A stray domestic shorthair cat weighing 3.1 kg was presented with lethargy, anorexia, intermittent fever, and persistent upper respiratory signs. The caretaker reported that the cat had been involved in a fight with another cat approximately four days prior to initial evaluation, followed by the development of abscesses on the forelimb and dorsal region. Although the wounds gradually dried after approximately two weeks, the cat continued to show reduced appetite and ongoing nasal discharge.

The patient had no history of vaccination or deworming. Physical examination revealed poor body condition and heavy ectoparasite infestation, with numerous *Ctenocephalides felis* observed across the body surface (**Figure 1**).

Figure 1: Heavy flea infestation (*Ctenocephalides felis*) observed on the patient.

Physical examination revealed a rectal temperature of 40.1°C. The cat appeared malnourished with pale mucous membranes suggestive of anemia. Respiratory and cardiac auscultation did not reveal significant abnormalities. Due to persistent systemic illness, the patient underwent hospitalization from 23 June 2025 to 14 July 2025 for supportive care and further diagnostic investigation.

During the first week of hospitalization, the cat received long-acting enrofloxacin injections, flunixin, vitamin supplementation, albumin therapy, acetylcysteine, chlorpheniramine maleate, and meloxicam. Oral antimicrobial therapy consisted of a combination of ciprofloxacin and metronidazole.

In the second week, nebulization therapy was administered once daily for five consecutive days along with oral azithromycin. Despite these treatments, clinical improvement remained minimal, prompting additional diagnostic evaluation.

Serial hematological evaluations were performed during hospitalization to monitor disease progression. The initial complete blood count revealed severe anemia characterized by decreased erythrocyte count, hemoglobin concentration, and hematocrit, accompanied by leukocytosis and inflammatory leukogram changes (**Table 1**). Follow-up hematology demonstrated persistent anemia with ongoing inflammatory response. Serum biochemical analysis indicated mild hyperbilirubinemia and increased globulin concentration, while renal parameters remained within reference intervals (**Table 2**).

Table 1. Serial hematological findings of the patient during hospitalization.

Parameter	Unit	Reference Range	Initial Blood Test	Follow-up Blood Test
WBC	10^9/L	3.5 – 20.7	30.63 ↑	25.57 ↑
RBC	10^{12}/L	7.7 – 12.8	3.25 ↓	4.33 ↓
HGB	g/dL	10.0 – 17.0	4.3 ↓	5.0 ↓
HCT	%	33.7 – 55.4	15.18 ↓	18.7 ↓
MCV	fL	35 – 52	47	43.2
MCH	pg	10.0 - 16.9	13.2	11.5
MCHC	g/dL	27 – 35	28.4	26.7 ↓
RDW	%	15 – 27	26.8	26.6
Reticulocyte	K/μL	3 – 50	—	56.3↑
Neutrophil	10^9/L	1.6 – 13.3	24.95 ↑	18.37↑
Lymphocyte	10^9/L	0.8 – 9.1	3.48	6.42
Monocyte	10^9/L	0.0 – 0.9	1.36 ↑	2.67 ↑
Eosinophil	10^9/L	0.17 - 1.57	0.75	1.07
Basophil	10^9/L	0.0 - 0.2	0.09	0.04
Platelet	10^9/L	125 – 618	617	625 ↑

Note: Values outside the reference range are indicated as ↑ (increased) or ↓ (decreased); — (parameter not measured at that time point). Reference ranges represent standard adult feline laboratory intervals.

Table 2. Serum biochemical profile of the patient.

Parameter	Unit	Reference Range	Initial Blood Test	Follow-up Blood Test
Glucose	mg/dL	70 – 150	128	108
BUN	mg/dL	10 – 30	13	16
Creatinine	mg/dL	0.3 – 2.1	0.7	0.6
Total Protein	g/dL	5.4 – 8.2	7.9	7.8
Albumin	g/dL	2.2 – 4.4	2.8	2.4
Globulin	g/dL	1.5 – 5.1	5.1	5.3↑
ALT	U/L	20 – 100	43	61
ALP	U/L	10 – 90	6 ↓	26
Total Bilirubin	mg/dL	0.1 – 0.6	1.1 ↑	—

Note: Values outside the reference range are indicated as ↑ (increased) or ↓ (decreased); – (parameter not measured at that time point). Reference ranges represent standard adult feline laboratory intervals.

Thoracic radiography demonstrated a normal cardiac silhouette and pulmonary structures without evidence of pleural effusion or pulmonary infiltrates. The large intestine appeared gas-filled, and the stomach was empty (**Figure 2**).

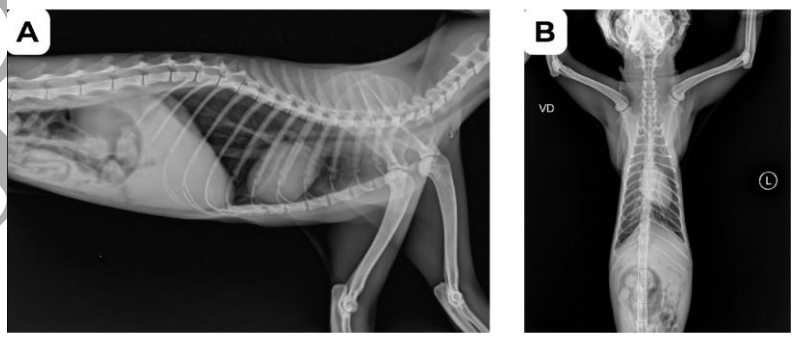

Figure 2: Thoracic radiographic findings showing normal cardiac silhouette and pulmonary structures. **(a)** left lateral recumbency, (**b)** ventrodorsal recumbency

Molecular diagnostic testing using polymerase chain reaction (PCR) panels targeting blood-borne and respiratory pathogens detected *Mycoplasma haemofelis* DNA in whole blood samples. Feline immunodeficiency virus (FIV), feline leukemia virus (FeLV), feline herpesvirus-1 (FHV-1), feline calicivirus (FCV), *Bordetella bronchiseptica*, and *Chlamydia felis* were not detected (**Table 3**).

Table 3. Polymerase chain reaction (PCR) results for blood-borne and respiratory pathogens.

Target Pathogen	Sample type	Result
Mycoplasma haemofelis	Whole blood	Positive
Feline immunodeficiency virus (FIV)	Whole blood	Negative
Feline leukemia virus (FeLV)	Whole blood	Negative
Feline herpesvirus-1 (FHV-1)	Nasal&ocular swab	Negative
Feline calicivirus (FCV)	Nasal&ocular swab	Negative
Bordetella bronchiseptica	Nasal&ocular swab	Negative
Chlamydia felis	Nasal&ocular swab	Negative

Based on clinical presentation, hematological abnormalities, radiographic findings, and PCR confirmation, the cat was diagnosed with severe regenerative anemia associated with *Mycoplasma haemofelis* infection

3. Discussion

Hemotropic mycoplasma infection represents an important infectious cause of hemolytic anemia in cats and has been widely reported in both clinical and epidemiological studies. Similar hemoplasma infections in dogs and cats have been reported in different geographic regions, supporting the global distribution and clinical relevance of these organisms in veterinary practice [5]. These cell wall-deficient organisms attach to the surface of erythrocytes, resulting in immune-mediated destruction and subsequent regenerative anemia [6,7]. The severe anemia observed in the present case is consistent with previously described hematological alterations associated with feline hemoplasmosis, including reduced hematocrit and erythrocyte counts, accompanied by systemic inflammatory responses. Accurate interpretation of regenerative anemia requires evaluation of hematological indices and inflammatory response patterns, which are essential for differentiating hemolytic causes from other etiologies in feline patients [3].

Clinical signs such as fever, lethargy, anorexia, and pale mucous membranes observed in this patient are comparable to those reported in naturally infected cats. Previous case reports have described similar presentations, particularly in animals with outdoor access, lack of preventive healthcare, and exposure to ectoparasites [8,9]. The heavy infestation of *Ctenocephalides felis* identified in this cat may have played a role in pathogen transmission, as arthropod vectors and bite wounds are recognized routes of hemoplasma spread. Flea infestation in cats is considered an important risk factor for hemotropic mycoplasma transmission, particularly in free-roaming animals with limited ectoparasite control.

Radiographic findings in this case did not reveal significant pulmonary abnormalities, suggesting that respiratory signs were likely secondary to systemic illness rather than primary respiratory infection. Similar observations have been reported in hemoplasma-infected cats, in which nonspecific respiratory signs may occur without radiographic evidence of pulmonary disease [7]. Negative PCR results for common respiratory pathogens further support this interpretation.

Biochemical alterations, including mild hyperbilirubinemia and increased globulin concentration, may reflect hemolysis and chronic immune stimulation. Elevated bilirubin concentrations have been described in cats with hemotropic mycoplasmosis and are often attributed to increased erythrocyte destruction and inflammatory hepatobiliary changes. These findings support the hypothesis that systemic infection rather than primary hepatic disease contributed to the observed biochemical abnormalities [10].

Although broad-spectrum antimicrobial therapy and supportive care were administered during hospitalization, clinical improvement remained limited. Previous literature indicates that treatment response in feline

hemoplasmosis may vary depending on disease severity, concurrent infections, and timing of targeted antimicrobial therapy [8]. The delayed molecular confirmation of *Mycoplasma haemofelis* in this case highlights the diagnostic challenges posed by nonspecific clinical presentations and underscores the importance of early PCR testing in cats with unexplained anemia.

Continuation of hospitalization and further therapeutic monitoring could not be achieved because the owner elected to discontinue inpatient care and home-based treatment. Consequently, long-term hematological recovery and clinical outcome could not be fully evaluated, which represents a limitation of this report. Nevertheless, this case reinforces the importance of including hemotropic mycoplasma infection as a differential diagnosis in stray cats presenting with severe regenerative anemia, ectoparasite infestation, and systemic illness.

These findings highlight the multifactorial nature of hemoplasmosis in stray and free-roaming cats, involving vector exposure, immune-mediated hemolysis, and systemic inflammatory responses.

4. Conclusion

This case report describes severe regenerative anemia associated with *Mycoplasma haemofelis* infection in a stray domestic shorthair cat presenting with lethargy, fever, ectoparasite infestation, and persistent inflammatory changes. Serial hematological findings and PCR confirmation were essential in establishing the diagnosis when clinical signs were nonspecific. Although supportive and antimicrobial therapy were administered, clinical improvement remained limited, and long-term outcome evaluation was restricted due to discontinuation of hospitalization. These findings highlight the importance of early molecular diagnostics and comprehensive clinical evaluation in stray cats presenting with unexplained regenerative anemia and systemic inflammatory disease.

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Authors' Contribution

M.F.R. served as the lead veterinarian responsible for case management, clinical decision-making, manuscript writing, and overall study coordination. I.A. and R.M. contributed to drafting, article templating, manuscript preparation, and submission readiness. H.L.S., R.A.S., and R.J.N. were responsible for daily patient care, treatment administration, and therapeutic monitoring. R.Y. served as the clinical pathology consultant and provided hematological interpretation. R.W. contributed as the radiology consultant and was responsible for radiographic interpretation and evaluation. R.L.B. and S.A. contributed to methodology development, scientific supervision, and academic guidance. E.A.A. and N.M. were responsible for manuscript translation, revision, language editing, final manuscript refinement, and academic review.

Conflict of Interest

The authors declare that there are no conflicts of interest related to this case report.

Ethics Approval

Ethical approval was not required for this case report because all procedures were performed as part of routine clinical treatment to alleviate the animal’s suffering. Written informed consent was obtained from the owner.

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Artificial Intelligence (AI) Statement

AI-assisted tools were used only for English language editing and grammar improvement. All scientific content and conclusions were originally developed by the authors, who take full responsibility for the manuscript.

Data Availability

All data supporting the findings of this study are available within this article.

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