



## Case Report

### Feline Infectious Peritonitis (FIP) Pada Kucing Ras Himalaya Di Klinik Hewan Pendidikan Universitas Hasanuddin

Charisma Sumule, Abdul Wahid Jamaluddin, Musdalifah, Wa Ode Santa Monica\*

Study Program of Veterinary Medicine, Faculty of Medicine, Hasanuddin University, Jl. Perintis Kemerdekaan Km. 10, Makassar, 90245, Indonesia

\*Corresponding author: Waode Santa Monica ([santawaode@med.unhas.ac.id](mailto:santawaode@med.unhas.ac.id))

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#### Abstract

*Feline infectious peritonitis (FIP) is a viral disease, this disease can cause death in various types of cats but is not zoonotic. Feline infectious peritonitis (FIP) is caused by Feline corona virus (FCoV) from the family Coronaviridae, genus Alphacoronavirus. The purpose of writing a case study is to find out how to diagnose and treat FIP in cats. Methods for diagnosing FIP include anamnesis, clinical examination, ultrasonographic examination (USG) and laboratory examinations consisting of hematological tests and Rivalta tests. The results of the physical examination showed changes in appetite, diarrhea, weakness, 8% dehydration, Body Condition Score 2, abdominal enlargement. Laboratory results using ultrasound showed accumulation of fluid in the abdominal cavity and kidney enlargement 4.29 cm, while the results of hematological examinations decreased the value of the MCV 33 fL, MCH 12 pg and WBC  $1.37 \times 10^3 / \mu\text{L}$  while the MCHC was 53.7 g/dL has increased, the results of the Rivalta test showed a positive result of FIP found the presence of jellyfish-shaped deposits. Handling of FIP cases is treated with antibiotics, multivitamins, fluid therapy, and feed management.*

*Key words: Acites, feline infectious peritonitis, cat.*

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#### Introduction

Feline infectious peritonitis (FIP) is a viral disease that is generally fatal in various types of cats, caused by Feline corona virus (FCoV) of the Alphacoronavirus genus, Coronaviridae family (Arimbi, 2010). There are two biotypes of Feline corona virus (FCoV), namely Feline enteric coronavirus (FECV) and Feline infectious peritonitis virus (FIPV). If the cat's immune response is not good, FECV will mutate into FIPV which can cause systemic disease. Based on the shape, Feline infectious peritonitis virus (FIPV) is divided into wet FIP and dry FIP. Wet FIP is a continuation of dry FIP, but cases of wet FIP are more common than dry ones up to 75% (Uliantara and Suparti, 2014).

Most cases of FIP occur in cats aged 6-24 months (Arimbi, 2010). Transmission of the coronavirus is generally through contact between cats and exposure to contaminated patient

feces (Aswar, 2009). Feline infectious peritonitis replicates in enterocyte cells in several parts of the small intestine and colon and then circulates in the bloodstream (Kipar *et al.*, 2010).

## Case Report

History: The cat has had diarrhea for one day, does not want to eat, has been given deworming medicine and a complete vaccine two months ago. Always give dry food before the cat is sick and replace it with alkaline food during illness. Previously, the cat had been to the clinic twice in 2 weeks with symptoms such as diarrhea, decreased appetite, and weakness. Signs: Pet cat, male sex, 7 months old, weight 1.8 kg, and white and gray bicolor. Clinical Symptoms: Anorexia, weakness, diarrhea, BCS 2, abdominal palpation revealed an empty bowel and an empty VU, but the abdomen was slightly bloated and painful on palpation. Physical Examination: Heart rate 116x/minute, pulse rate 92x/minute, respiratory rate 28x/minute, temperature 40.7oC, dehydration rate 8%, skin turgor 4 seconds, pale oral mucosa, and gloomy face. Supporting Diagnosis: Ultrasound imaging (USG) to observe ascites and kidneys in the abdominal cavity, hematological examination to determine the condition of blood cells and the cause of infection, and Rivalta test to determine whether the ecites fluid is transudate or exudate. Diagnosis: FIPV (Feline Infectious Peritonitis Virus). Prognosis: Dubius-infausta. Treatment: Ceftriaxone® and Metrodinazole IV antibiotics, supportive therapy with Ringer lactate isingeric infusion, Royal Canin Recovery diet feed, and Bionsu TP® multivitamin.

## Results and Discussion

Accumulation of fluid in the abdominal cavity indicating ascites or peritoneal effusion characterized by anechoic structures visible on the dorsal side of the kidney on ultrasound examination (Fig. 1a). One of the causes of ascites is glomerular damage that will affect the kidneys, resulting in the release of protein in the urine (proteinuria) known as protein-losing nephropathies (Carlton & McGavin 2001).

The thickening of the renal cortex and renal capsule that appeared hyperechoic (Fig. 1c), indicated the presence of high echogenicity in the form of a collection of connective tissue (fibrosis) coupled with the presence of residual inflammatory cells. In Figures 1b and 1c, the renal cortex appears thicker and the medulla appears smaller which indicates that the kidney has lost its normal structure, this can be caused by the formation of connective tissue in the kidney due to an inflammatory reaction so that the medulla and cortex boundaries are not clearly visible. In Figure 1e, a line is drawn to determine the patient's kidney size, and the kidney size is 4.29 cm. The normal size of a cat's kidney is 3.2-4.2 cm, so it can be said that the kidney size is not normal (Debruyne *et al.*, 2013).

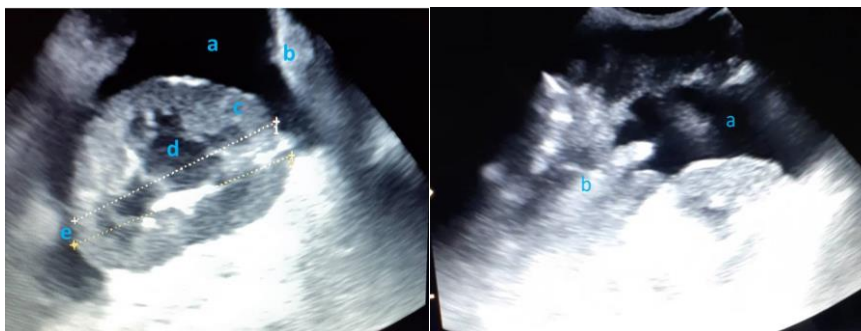


Figure 1. Ultrasound examination (USG) persian cat a) accumulation of fluid in the abdominal cavity, b) intestine, c) there is thickening of the renal cortex and the capsule looks hyperechoic, d) renal medulla looks small, e) kidney size is 4.29 cm.

Table 1. Hematology Examination Results

Item	Result	Reference	Note
WBC	1,37 10 <sup>3</sup> /uL	5,5 – 19,5	<b>L</b>
LYM	0,44 10 <sup>3</sup> /uL	1,5 – 7,0	<b>L</b>
MON	0,07 10 <sup>3</sup> /uL	0,00 – 1,5	-
NEU	0,75 10 <sup>3</sup> /uL	2,50 – 14,00	<b>L</b>
EOS	0,09 10 <sup>3</sup> /uL	0,00 – 1,00	-
BAS	0,01 10 <sup>3</sup> /uL	0,00 – 0,20	-
RBC	7,68 10 <sup>6</sup> /UI	5,00 – 10,00	-
HGB	13,5 g/dL	8,0 – 15,0	-
HCT	25,16 %	24,00 – 45,00	-
MCV	33 fL	39 – 55	<b>L</b>
MCH	12 pg	12,5 – 17,5	<b>L</b>
MCHC	53,7 g/dL	30,0 – 36,0	<b>H</b>
PLT	666 10 <sup>3</sup> /uL	300 - 800	-
MPV	7,6 fL	12,0 – 17,0	<b>L</b>

The results of the hematological examination of the patient's blood showed that the WBC or white blood cell value was 1.37. 10<sup>9</sup>/L where the normal value of WBC is 5.5-19.5. 10<sup>9</sup>/L means that there is a decrease in WBC by 4.13 10<sup>9</sup>/L which interprets that the cat has leukopenia where there is a decrease in the number of leukocytes. The patient had bacterial and viral infections, where the decrease in the WBC value was confirmed by the decreased Lymphocyte value, which was 1.06. 10<sup>9</sup>/L from the normal value of 1.5-7. 10<sup>9</sup>/L. A decrease in lymphocytes indicates the presence of a viral infection. Then the value of Neutrophils is 0.75. 10<sup>9</sup>/L from the normal value of 2.5-15. 10<sup>9</sup>/L. A decrease in neutrophils indicates a bacterial infection and inflammatory disorder. While the values of Monocytes, Eosinophils, and Basophils were still normal.

The MCV value is 33 fl, where the normal value for MCV in cats is 39-55 fl, meaning that there is a decrease in the MCV value by 6 fl, which causes the patient to experience iron deficiency anemia, pernicious anemia and thalassemia, also called microcytic anemia. The MCH value is 12 pg where the normal value of MCH is 12.5-17.5 pg, meaning that there is a decrease with the MCH value of 0.5 pg which indicates the average Hb weight in red blood cells has decreased slightly. MCH can be used to diagnose anemia. The MCHC value is 53.7% where the normal value of MCHC is 30-36%, meaning that there is an increase in the MCHC value of 17.7% which means that the average Hb concentration in blood cells is high so that the blood cells are small in size. However, the MPV value is 7.6 fL where the normal value is 12.0 – 17.0 fL, which means there is a decrease in MPV as much as 4.4 fL which indicates that Platelets (Platelets) have a small size but platelets in the blood remain normal.

Rivalta's test is a conventional examination that is still often done today to differentiate transudate pleural effusion (negative Rivalta's test) and exudate (positive Rivalta's test). This indicates that the Rivalta test is positive and indicates the cat is infected with FIPV. The interpretation of the Rivalta test shows a positive test result if it causes a significant cloudiness similar to thick fog, a precipitate forms (exudate), a weak positive test result if it causes cloudiness similar to a fine mist (transudate fluid), and a negative test result if it does not cause turbidity (normal body fluids/fluids). transudate) (Levy, 2014).



Figure 2. Examination of peritoneal effusion with Rivalta's test

Handling for cases of Feline infectious peritonitis (FIP) can be done by giving antibiotics, multivitamins, fluid therapy and feed management. Ceftriaxone antibiotic 2 times a day intravenously. Ceftriaxone is a broad-spectrum antibiotic but is more effective against gram-negative bacteria. Ceftriaxone will spread throughout the body, up to the cerebrospinal fluid. The absorption rate of ceftriaxone can be as high as 95% (Plumb, 2000). Metrodinazole IV antibiotics as much as 2 times a day intravenously. Metrodinazole IV is an antibiotic used for anaerobic bacteria as well as gram positive and gram-negative bacteria. The multivitamin given was Bionsu TP® with a frequency of once a day intramuscularly. Bionsu TP contains ATP. ATP is needed to replace energy lost due to illness. The vitamin content in bionsu TP will increase metabolism in the body thereby increasing endurance and maintaining healthy organs. Fluid therapy is performed to maintain fluid balance in the body so that the patient does not become dehydrated. Fluid therapy given is Ringer's lactate solution where 1 drop per 13 seconds.

## Conclusion

Based on several examinations, such as anamnesis, signs and clinical examination, it was shown that the cat was suspected of being infected with Feline Infectious Peritonitis (FIP), which was characterized by enlargement of the abdomen. Diagnosis is made by ultrasound, complete blood count and Rivalta test. Treatments include administration of infusion fluid therapy, antibiotics, multivitamins as supportive therapy, and supporting feed therapy.

## References

- Arimbi. 2010. Suspec Feline Infectious Peritonitis (FIP) Pada Kucing Ras di Surabaya. *Vol. 3 - No. 2 / 2010-07 TOC : 6, and page : 109 – 114*. Fakultas Kedokteran Hewan Unair.
- Aswar. 2009. *Studi Kasus Patologi Feline Infectious Peritonitis Pada Anak Kucing (Felis catus)*. Fakultas Kedokteran Hewan Institut Pertanian Bogor; Bogor.
- Carlton WW dan McGavin MD. 2001. Thomson's Special Veterinary Pathology. St. Louis: Mosby-Year Book, Inc. page 209-245.
- Debruyne K, Paepe D, Daminet S, Combes A, Duchateau L, Peremans K, Saunders JH. 2013. Renal dimensions at ultrasonography in healthy Ragdoll cats with normal kidney morphology: correlation with age, gender and bodyweight. *Journal of Feline Medicine and Surgery* 15 (12): 1046–1051
- Kipar A, Meli ML, Baptiste KE, Bowker LJ and Lutz H. 2010. Sites of feline coronavirus persistence in healthy cats. *Journal of general virology*. 91(7): 1698-1707.

- Levy, Julie. K. 2014. *Overview of Feline Infectious Peritonitis*. University of Florida College of Veterinary Medicine; Amerika Serikat
- Uliantara, G. A. J dan I. K. E. Supartika. 2014. Feline Infectious Peritonitis Pada Kucing Lokal. Buletin Veteriner, BBVet Denpasar, *Vol. XXVI, No. 85, ISSN : 0854-901X*.
- Plumb, D. C. 2000. *Veterinary Drug Handbook Eighth Edition*. Wiley Blackwell, New Jersey.