



**UNIVERSITI PUTRA MALAYSIA**

***A PROSPECTIVE STUDY OF FELINE PLEURAL EFFUSION IN  
UNIVERSITY VETERINARY HOSPITAL***

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## ABSTRACT

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment  
of the requirement for the degree of Master of Veterinary Medicine

A PROSPECTIVE STUDY OF FELINE PLEURAL EFFUSION IN UNIVERSITY  
VETERINARY HOSPITAL

By

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Pleural effusion is one of the common dyspnea condition in cats presented to University Veterinary Hospital (UVH). Number of pleural effusion cases presented has been recorded increased since 2008. Management in terms of diagnosis, treatment and client education for these cases has not been properly revised. Moreover, to date, no proper established data and nature of the condition been investigate. As a result, this study were conducted with the aim to study the prevalence of feline pleural effusion cases in UVH; determine the distribution of age, breed, sex and lifestyle factors; identify the most common fluid types and causes of

pleural effusion and also to identify common bacterial isolated from fluid sample. Additional test of bacterial culture were performed to every fluid samples to determine the need of this test to be part of the routine diagnosis for pleural effusion. The result reveals a prevalence rate of 1.3% (n= 40/2,991) from cat population and 33 % (n=40/123) from dyspnea population obtained for pleural effusion cases presented within 6 months period. Majority of the cats presented are those between the age of 3 months to 1 year old 50 % (20/40) and were sexually intact male 52.5% (21/40). Domestic Shorthaired (DSH) breed were over-presented with 77.5% (31/40) rate and cats with outdoor lifestyle are presented the most with 67.5% (27/40). Exudative effusion was predominantly presented at 65 % (24/34), with FIP (n=13/34) and pyothorax (n= 11/34) become the common caused. Only sample from suspected pyothorax cases shows bacterial growth with 50% (11/22) rate and none in the rest of the sample. *Rhodococcus equi* appeared to be the most bacterial isolated from the fluid samples , with 72.7% (8/11) rate. These study demonstrate that although feline pleural effusion is not a common disease presented to UVH, it is however the highest respiratory condition manifested by dyspnea. It shows that FIP and pyothorax are the common cause of pleural effusion which also proves that FIP is primarily a disease of a young cats. Although other risk factor of breed, sex and lifestyle may contribute to the pleural effusion occurrence; it is very dependant on the underlying caused of the disease. The study also proves that bacterial culture is not a routine test to be performed as part of diagnosis of pleural effusion unless if pyothorax is suspected. The findings that *Rhodococcus equi* are the most common caused of pyothorax in cats would justify the needs of further investigation to be carry out to fully understand this new emerging disease.

## ABSTRAK

ABSTRAK tesis yang dikemukakan kepada Senat Universiti Putra Malaysia bagi menepati keperluan untuk Ijazah Master Perubatan Veterinar

### SATU KAJIAN PROSPEKTIF PENYAKIT EFFUSI PLEURA PADA KUCING-DI HOSPITAL VETERINAR UNIVERSITI

Oleh

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Effusi pleural adalah satu keadaan lelah pada kucing yang biasa dirujuk kepada Hospital Veterinar Universiti (UVH). Bilangan kes effusi pleura telah direkodkan meningkat sejak tahun 2008. Tiada semakan dibuat berkaitan pengurusan penyakit dari segi diagnosis, rawatan dan pengetahuan pelanggan untuk kes-kes effusi pleura selama ini. Tambahan pula, tiada kajian pernah dijalankan terhadap data dan jenis effusi terlibat. Oleh itu, kajian ini dijalankan dengan tujuan untuk mengkaji prevalens kes effusi pleura pada kucing di UVH; menentukan taburan faktor umur, baka, jantina dan gaya hidup; mengenal pasti jenis effusi yang paling biasa dan penyebabnya. serta mengenalpasti bakteria yang diasingkan dari sampel cecair. Ujian

kultur bakteria juga dijalankan untuk setiap sampel bagi menentukan keperluan ujian ini sebagai sebahagian daripada rutin diagnosis bagi effusi pleura. Keputusan menunjukkan kadar prevalens 1.3% ( $n = 40/2,991$ ) dari populasi kucing dan 33% ( $n = 40/123$ ) dari populasi lelah diperoleh bagi kes effusi pleura dalam tempoh 6 bulan. Kucing berusia antara 3 bulan hingga 1 tahun adalah sering mendapat effusi pleura dengan kadar 50% (20/40) dan 52.5% (21/40), pula kerap terjadi pada kucing jantan yang belum dikasi. Baka Domestik Shorthaired (DSH) kerap dilihat dalam kajian ini dengan kadar 77.5% (31/40) dan kucing yang hidup bebas didapati pada kadar 67.5% (27/40). Effusi jenis eksudat adalah yang terbanyak direkodkan iaitu pada 65% (24/34), di mana FIP ( $n = 13/34$ ) dan pyothorax ( $n = 11/34$ ) menjadi punca utama. Hanya sampel dari kes yang disyaki pyothorax menunjukkan pertumbuhan bakteria dengan kadar 50% (11/22) dan tidak ada dalam sampel yang lain. *Rhodococcus equi* merupakan bakteria terbanyak dikultur dengan kadar 72.7% (8/11). Kajian ini menunjukkan bahawa walaupun effusi pleura bukanlah satu penyakit yang biasa dikemukakan kepada UVH, tetapi ia penyebab terbanyak kepada masalah pernafasan pada kucing. Ia juga menunjukkan bahawa FIP dan pyothorax adalah punca biasa masalah effusi pleura yang juga membuktikan bahawa FIP adalah penyakit kucing muda. Walaupun faktor risiko lain; baka, jantina dan gaya hidup boleh menyumbang kepada berlakunya effusi pleura; ianya sangat bergantung kepada jenis penyakit terlibat. Kajian ini juga membuktikan bahawa mengkultur bakteria bukanlah ujian rutin perlu dilakukan sebagai sebahagian daripada diagnosis effusi pleura melainkan jika pyothorax disyaki. Penemuan bahawa bakteria *Rhodococcus equi* adalah penyebab biasa pyothorax pada kucing menunjukkan perlunya siasatan lanjut dijalankan untuk memahami sepenuhnya penyakit yang baru muncul ini.

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## LIST OF ABBREVIATIONS

Universiti Veterinary Hospital (UVH).....	5
Congestive Heart Failure (CHF) .....	11
Dorsoventral (DV) .....	13
Feline Upper Respiratory Disease (FURD).....	29

## CHAPTER 1

### INTRODUCTION

Pleural effusion in cat is one of the common cardiorespiratory conditions that commonly seen at Universiti Veterinary Hospital (UVH). Cats often presented with severe respiratory distress which require immediate attention. Careful handling, stabilization with proper oxygen supplementation and therapeutic thoracocentesis is essential to avoid respiratory failure. An approach to determine the underlying aetiology is the key to an appropriate management. Besides supportive information from the history and physical examination, a diagnostic method to confirm pleural effusion from other dyspnoeic related diseases is a chest radiograph (Sherding R.G, Birchard S.; 2006). Further, a more specific test will be conducted to get into a diagnosis which involved blood screening, fluid analysis, serum immunology test, ultrasonography and even bacterial culture. This is because the underlying cause of the condition is normally related with major diseases such as cardiac diseases, neoplasia, pyothorax and Feline Infectious Peritonitis. The treatment option is based on the related diseases. It is beneficial and yet recommended in some practices; however, the outcome will not be prolong as it always progressively worse and ends up with death at the end. Therefore, the prognosis for pleural effusion is always classified as poor to guarded; as the disease related to the pleural effusion condition is usually life threatening.

## 1.1 Problem Statement

The number of pleural effusion cases presented to UVH was increased between year 2008 to 2012 (Abu Huzairah 2014) as shown in figure 1 below. In year 2008, the cases related with pleural effusion was still consider new whereby there are no proper management or standard of diagnosis and treatment was established. The final diagnoses of diseases causing pleural effusion in those days are limited to chest radiography, general blood test and fluid analysis only. Further test such as immunological study, ultrasonography and echocardiography, or even fine needle aspiration (FNA) for sampling were still very new to the practitioners besides lack of practice and proper diagnostic equipment. The treatment options also were limited to thoracentesis and symptomatic medical therapy.



Figure 1: Pleural Effusion Cases in UVH from 2008 to 2012 (Abu Huzairah, 2014)

However, in year 2010, corresponding to the increased in number of cases, together with establishment of proper diagnostic equipments, our management of pleural effusion cases has much improved. The determination of diseases related to pleural effusion become more convenient These were leads to a better treatment options such as chemotherapy (for neoplastic cases) or specific cardiac treatment for heart disease patients. However to date, there is no proper established data on the distribution and nature of the feline pleural effusion cases in UVH. It is known to be a life threatening condition as it involved major diseases, thus the knowledge on disease prevalence, the population at risk, common infectious agent and possible outcome of treatment will help to enhance our management of pleural effusion cases in a future and perhaps to increase their survival rate. Even though our existing diagnostic protocol has already sufficient to determine causes of pleural effusion, however further improvement concurrent with international practices and guideline will contribute positive enhancement in tackling matters and issues in pleural effusion especially within veterinary medicine.

## 1.2 Objectives

Thus the objectives of this study include:

- a) To determine the prevalence of feline pleural effusion cases in UVH.
- b) To determine the distribution of age, breed, sex and lifestyle of cats diagnosed with pleural effusion
- c) To identify the most common fluid types and its relation to the causes of the pleural effusion
- d) To identify the most common bacterial isolation in sample of pleural fluid
- e) To determine the mortality rate related with the pleural effusion case

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