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## Study on pathology of respiratory system of dogs

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#### Abstract

A total of 16 number of postmortem examination was conducted and examined for gross and histopathological changes in lungs during the study period. Lungs samples were collected in neutral buffer formalin and were processed for histopathological examination. Pneumonia, emphysema, anthracosis and haemorrhages were common gross changes observed. Histopathological examination revealed pneumonia, anthracosis, edema, congestion and haemorrhage.

**Keywords:** Canine, lungs, gross, histopathology, H & E stain

#### Introduction

Diseases of the respiratory system (Respiratory apparatus) are some of the leading causes of morbidity and mortality in animals and a major source of economic losses. In the past few years, animal shelters have been recognized as a major risk factor for respiratory diseases in dogs and cats a comparable situation to what is reported in human beings with nosocomial infections [1]. The most common pathological lesions observed in lungs were pneumonia, anthracosis, emphysema, congestion and haemorrhages [2]. Anthracosis were commonly observed in dogs that are lived in urban areas and in old aged dogs [3]. Reif and Rhodes (1966) [4] reported that emphysema was commonly observed in old aged dogs. Pneumonia is also a common disease that is seen in dogs which might be due to multifactorial agent. Among which *Streptococcus equi Subspecies zooepidemicus* has been reported to cause severe and often fatal hemorrhagic and necrotizing pneumonia that can spread rapidly through kennel environment [5]. Bacterial pneumonia is one of the most common diagnosis in dogs with acute or chronic respiratory disease and the most common cause of canine bronchiectasis [6]. Hemoptysis has been reported to occur most commonly in dogs with bacterial pneumonia [7]. Merveille *et al.* (2014) [8] have studied that the prevalence of bronchopneumonia in Old English Sheepdogs with primary ciliary dyskinesia was 100%.

#### Materials and Methods

##### Sample collection

The clinical cases was observed regularly and dead animals were subjected for systematic postmortem examination. Lungs samples were collected and preserved in 10% neutral buffer formalin for histopathological examination.

##### Histopathological examination of tissues

Formalin fixed tissues (2-3 mm thick) were taken, washed overnight in running tap water and then dehydrated in ascending grades of alcohol starting from 30%, 50%, 70%, 90% and absolute alcohol I, absolute alcohol II and finally cleared in xylene. These dehydrated tissue pieces were embedded in molten paraffin. Sections were cut at 4-5  $\mu$ m thick with semi-automatic rotatory microtome (MRS 3500, Histoline Laboratories) and stained with Mayer's hematoxylin and eosin [9]. The stained slides were examined under a trinocular research microscope (Olympus) and the magnified images of the tissues structures were captured for further study.

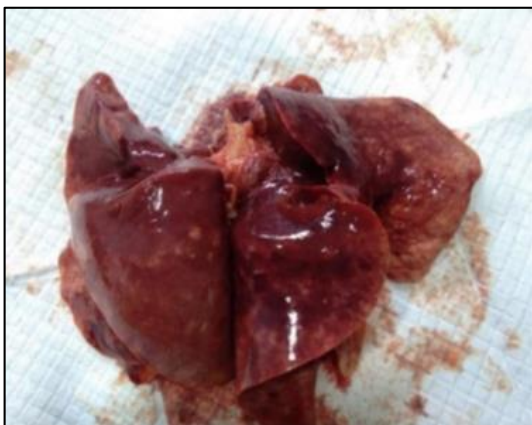
#### Results and Discussion

A total of 16 number of postmortem examination of dogs were conducted during the study period. Macroscopic examination revealed that the affected areas of lungs were darker in colour and edematous wet, heavy and the carbon particles appeared as very fine black or bluish black pigment in the lung tissue which concurred with the findings others workers [2, 10] which

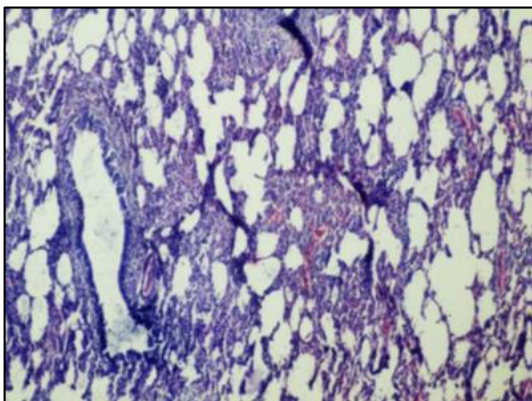
may be due to environmental or air pollution in which the dogs are living (Fig.1). Interstitial pneumonia with dark red areas of consolidation was a common findings during the study period <sup>[11-13]</sup> (Fig.2). Histopathological examination revealed that the alveoli were filled with serous or sero-fibrinous exudate with a few erythrocyte, polymorphonuclear leucocytes and mononuclear cells. This findings is in support with earlier worker <sup>[14]</sup> (Fig.3). Focal accumulation of black particle was seen in alveolar wall, interlobular septa and peribronchial tissue which is in agreement with the other findings <sup>[10]</sup> (Fig.4). Enlargement of the alveoli and breakage of alveolar wall with formation of large airspaces were also seen <sup>[15]</sup> (Fig.5). Edema, congestion and haemorrhages were common findings during the study period which was also describe by other worker <sup>[16]</sup> in dogs affected with fatal heat strokes which could be these conditions (Fig.6).



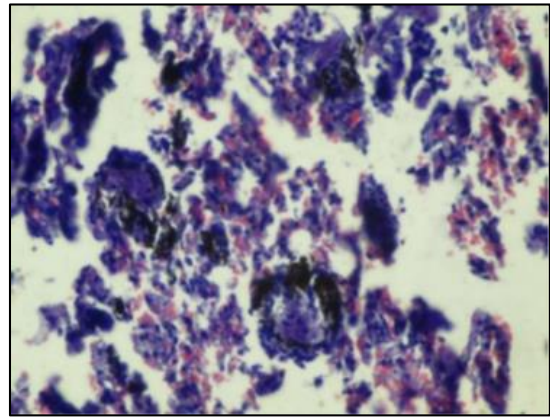
**Fig 1:** Lungs showing anthracosis



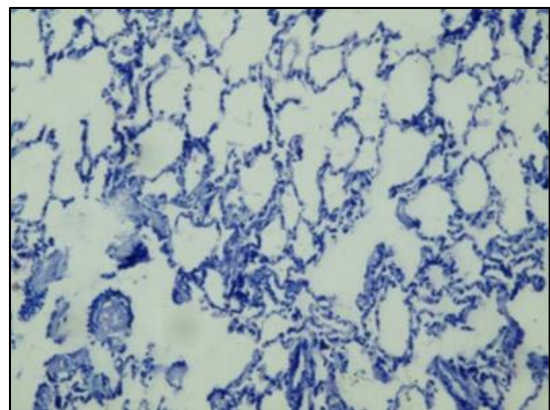
**Fig 2:** Lungs showing pulmonary haemorrhages



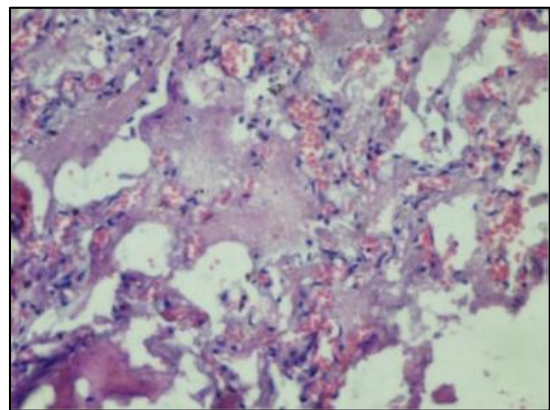
**Fig 3:** Lungs showing severe peri-bronchial infiltration and foci of alveolar consolidation (H&E, 400x)



**Fig 4:** Lungs showing deposition of dark black deposit (Anthracosis) with haemorrhagic areas (H & E, 400x)



**Fig 5:** Lungs showing emphysema (H & E, 400x)



**Fig 6:** Lungs showing edema, congestion and haemorrhage (H & E, 400x)

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