

PATHOLOGICAL STUDY ON LUNGS OF DROMEDARY CAMELS SLAUGHTERED IN THE CENTRAL PART OF IRAN

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ABSTRACT

This study was undertaken to find out gross and microscopic pulmonary lesions of dromedary camels in the central part of Iran. The grossly affected lungs from 100 camels with different ages and unknown history were collected from freshly slaughtered animals at Najafabad abattoir and examined grossly and histopathologically. The pathological changes observed were purulent bronchopneumonia (1%), interstitial pneumonia (14%), anthracosis (4%), hydatid cysts (51%), atelectasis (10%), emphysema (7%), and bullous emphysema (1%). In this study, interstitial pneumonia with different histological appearances was the most common form of pneumonia in the examined camels that may indicate various etiological agents or developmental stages of pneumonia. Numerous focal infiltrations of mononuclear inflammatory cells without fibroplastic reaction were associated with anthracosis.

Key words: Dromedary camels, Iran, pathology, pulmonary lesions

Various pathological lesions including pneumonia, hydatidosis, pulmonary abscesses, pleuritis, bronchitis, pneumoniosis, tubercle nodules, linear scars (Tligui *et al*, 2006; Zubair *et al*, 2004), lymphosarcoma (Kinne and Wernery, 2006) and primary bronchioalveolar adenocarcinoma (Gameel *et al*, 1998) have been described in the lungs of camels in literature. In addition to these lesions, pulmonary involvements have been observed in specific diseases such as camelpox, tuberculosis, aspergillosis and respiratory sonbobe disease (Bekele, 1999; El-Khouly *et al*, 1992; Kinne *et al*, 1998 and 2006). There is a study about exercise induced pulmonary haemorrhage in racing camels (Akbar *et al*, 1994).

This study was undertaken to find out gross and microscopic pulmonary lesions of dromedary camels in the central part of Iran. There are a few investigations about camel lung pathology in the other parts of Iran (Maleki *et al*, 2005).

Materials and Methods

The grossly affected lungs from 100 dromedary camels with different ages and unknown history were collected from freshly slaughtered animals at Najafabad abattoir in the central part of Iran and examined grossly. For histopathological examinations, tissue samples were taken from the lesions and fixed

in 10% neutral buffered formalin. They were processed and embedded in paraffin. Sections of 5 µm thickness were cut, stained with Haematoxylin and Eosin and studied microscopically.

Results

The results of this study are summarised in table 1. Interstitial pneumonia was seen in 14 camels (14%). Grossly, the lungs affected with interstitial pneumonia were heavy, pale or gray (Fig 1), and rubbery in texture. They did not collapse when the thoracic cavity was opened. Microscopically, the

Table 1. Pathological changes observed in the lungs of 100 slaughtered camels in the central part of Iran.

Type of pulmonary lesion	Number of cases or percent (%)
Purulent bronchopneumonia	1
Interstitial pneumonia	14
Anthracosis	4
Hydatid cysts	51
Atelectasis	10
Emphysema	7
Bullous emphysema	1
Total	88

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Fig 1. Gray discoloration of the lung with interstitial pneumonia.

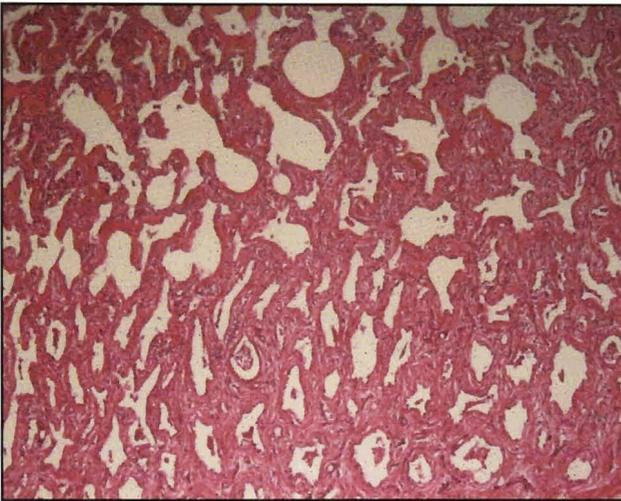


Fig 2. Interstitial pneumonia: the alveolar walls are notably thickened by severe fibrosis (H and E X 100).

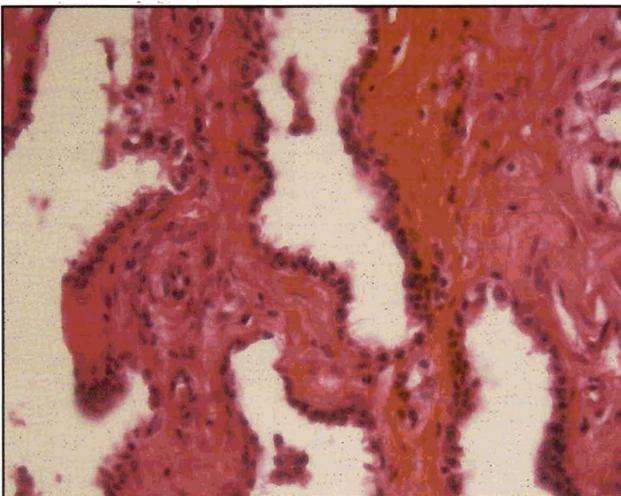


Fig 3. Interstitial pneumonia: hyperplasia of type II pneumonocytes and alveolar septa fibrosis (H and E X 400).

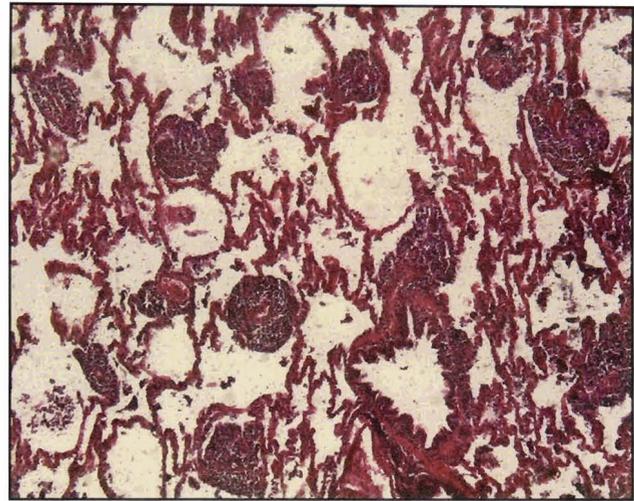


Fig 4. Anthracosis: focal infiltrations of mononuclear cells without fibroblastic reaction (H and E X 100).

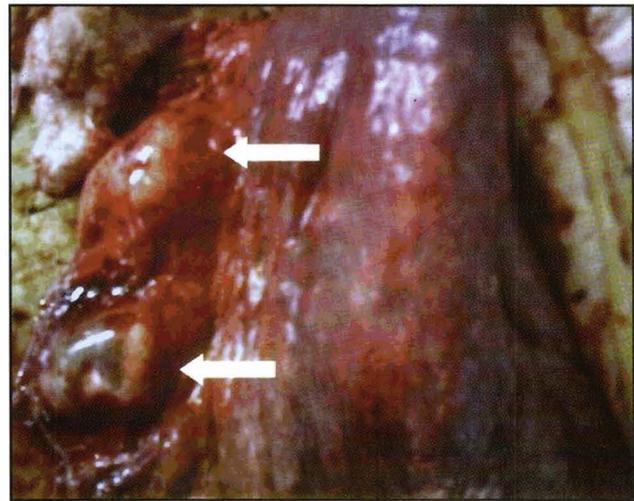


Fig 5. Bullous emphysema: note Two foci (arrows) of air accumulations in pulmonary parenchyma.

interstitial pneumonia had various histologic appearances that were classified broadly as acute and chronic interstitial pneumonia. The lesions in interstitial pneumonia were centered in the alveolar walls and its interstitium. The alveolar walls were notably thickened by fibrosis (Fig 2), and infiltration of lymphocytes and mononuclear inflammatory cells. In some cases, hyperplasia and hypertrophy of smooth muscles in airways and pulmonary vasculature, hyperplasia of type II pneumonocytes (Fig 3) that replaced necrotic type I pneumonocytes, and a mixture of desquamated epithelial cells, macrophages, and mononuclear cells in the lumen of airways and alveoli were present. Severe infiltrations of lymphocytes and perivascular cuffing were observed in alveolar septa of two cases with acute interstitial pneumonia. Numerous eosinophils were seen especially in the

visceral pleura and interlobular septa of two other cases.

Anthracosis was identified in 4 camels. Numerous focal infiltrations of mononuclear inflammatory cells without fibroblastic reaction (Fig 4) were associated with black particles of carbon in alveolar septa and peri-airways connective tissue.

Hydatidosis was found in 51 cases. The number of cysts varied from one to sixteen and their size ranged from smaller than one to six centimetres. Grossly, some cyst walls were calcified or had concentric layers and a large number of hydatid sands were present within cyst fluid too. Microscopically, a wide zone of atelectasis was present in pulmonary parenchyma adjacent to fibrotic cyst wall.

Atelectasis and emphysema were detected in 10 and 7 cases, respectively. In only one lung, two foci of bullous emphysema (about 5 centimetres in diameter) were seen (Fig 5).

Discussion

In this study, interstitial pneumonia with different histologic appearances was the most common form of pneumonia in the examined camels that may indicate various etiological agents or developmental stages of pneumonia. The incidence of pneumonia in camels is usually low and, if seen, is chronic in nature (Elfaki *et al*, 2002). Rearing systems, stress factors, climatic changes, unhygienic conditions, sudden changes in feed and a low level herd health status were stated as predisposing factors to bacterial and viral pneumonia. In camels, pneumonia outbreaks are usually observed during the change from the dry to the rainy season (Al-Tarazi, 2001).

Anthracosis was identified in 4 camels with numerous focal infiltrations of mononuclear inflammatory cells without fibroplastic reaction that may be due to developmental stage of the lesion. In contrast to this study, carbon granules induced fibroblastic proliferation which appeared in the form of dense nodules have been reported (Zubair *et al*, 2004). The common exogenous particles seen in camel lungs are carbon, silica and asbestos that small amounts of silica or asbestos may produce extensive fibrosis, whereas coal and iron are weakly fibrogenic at best (Al-Ani, 2004).

In this study, the most common observed pulmonary lesion was hydatid cyst with 51% infection rate. In a previous study, the highest rate of infection (59.3%) was recorded in the dromedary camels of this region (Ahmadi, 2005). Various infection rates of

hydatidosis have been reported from other countries including Pakistan (40%, Zubair *et al*, 2004), Kuwait (39.6%, Abdul-Salam and Farah, 1988), Libya (35.9%, Gusbi *et al*, 1990), Morocco (14.3%, Tligui *et al*, 2006), Egypt (7.67%, Dyab *et al*, 2005).

One lung showed two foci of bullous emphysema (about 5 cm in diameter). This lesion is not a specific type of emphysema and does not indicate a different disease process, but rather is a larger accumulation of air at one focus that is referred to as bulla (Lopez, 2007).

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News

CAMEL MILK CHOCOLATE *at the world's first camel milk chocolate shop*

Chocaholics and those with a sweet tooth are now able to stock up on the world's first ever camel milk chocolate, produced by Dubai company Al Nassma Chocolate LLC (Al Nassma). The company recently opened its first retail outlet, located in Umm Nahad in Dubai, four months after it launched the world's first camel milk chocolate. The shop is adjacent to Camelicious, the sole supplier of camel milk to Al Nassma. Stocked full with a decadent range of chocolate treats, it is guaranteed to cater to the most discerning of chocolate fans.