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Histopathological studies of Pulmonary Neoplasm & Pulmonary Hydatidosis in lungs of goats in Southern region of Rajasthan

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Abstract

The present investigation was carried out from January 2016 to December 2016. During this period a total number of 1157 lower respiratory tract samples of goats (irrespective of sex, age groups, and breeds) were examined. Out of these, 633 lower respiratory tract samples showed gross lesions, which were subjected to histopathological examinations. The occurrence of pulmonary adenocarcinoma was observed as 0.47 per cent, small cell carcinoma 0.15 per cent and pulmonary hydatidosis was observed as 3.31 per cent in Udaipur, Dungarpur, Chittorgarh and Rajsamand district of Rajasthan.

Keywords: Goat, southern Rajasthan, histopathology, pulmonary neoplasm & hydatidosis

Introduction

The Goat population in India is the 148.88 million (highest in Rajasthan, 20.84 million) showing an increase of 10.1% over the previous census (20th livestock census). Goats were among the first farm animals to be domesticated. As indicated by the archaeological evidence, they have been associated with man in a symbiotic relationship for up to 10,000 years (Ensminger and Parker, 1986) [5]. The diseases of respiratory system are the leading cause for mortality and morbidity in domestic animals with huge economic losses to farmers (Zachary and Mc Gavin, 2013) [17]. Respiratory diseases (pneumonia) were reported as the major causes of mortality in goats (Ameh *et al.*, 2000) [3]. Pneumonia can cause heavy economic losses to farmers including mortality, emaciation, poor growth gain, poor meat quality and condemnation of the affected lungs during meat inspection (Tijjani *et al.*, 2012) [16]. Small ruminants are especially important in the more extreme climates, and they are noted for their ability to convert low opportunity cost feed in to high value products including meat, milk, fibre, manure and hides (Asaye and Alemneh, 2015) [4]. In southern Rajasthan, no study has been conducted to study the occurrence and pathology of lower respiratory tract conditions in goat. Therefore, it becomes pertinent to analyse Gross and histopathological changes of lower respiratory tract in goat in this region of Rajasthan.

Materials and Methods

The present study was carried out from January 2016 to December 2016. During this period a total number of 1157 goat lower respiratory tract samples of irrespective age, groups, sex and breeds were collected from various veterinary clinics and slaughter house of Udaipur, Dungarpur, Chittorgarh, and Rajsamand districts of southern Rajasthan and were submitted to the Department of Veterinary Pathology, College of Veterinary and Animal Science, Navania, Vallabhnagar, Udaipur, for routine post-mortem examinations. Out of these, 633 samples showing gross lesions were further examined histopathologically.

The lung tissues measured 2-5 mm in thickness, presenting the lesions with normal tissue were used for fixation and pathological examinations. For histopathological examination, processing of tissues done by paraffin embedding using acetone and benzene technique (Lillie, 1965) [10]. The tissue sections of 4-6 micron were cut and stained with Hematoxylin and Eosin staining method as a routine (Luna, 1968) [12].

Result and Discussion

Out of these 1157 samples, 633 samples showed gross lesions were processed for subsequent histopathological examination. An overall occurrence Pulmonary neoplasm & Pulmonary Hydatidosis of lungs recorded as below table-1.

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Table 1: Histopathological finding in Lungs of Goat

District & No of sample examined	Pulmonary Neoplasm & Pulmonary Hydatidosis of lungs		
	Pulmonary Adenocarcinoma %	Small cell Carcinoma %	Pulmonary Hydatidosis %
Udaipur (N=184)	1	0	5
	0.54	0	2.71
Dungarpur (N=182)	0	1	6
	0	0.54	3.29
Chittorgarh (N=153)	1	0	4
	0.65	0	2.61
Rajsamand (N=114)	1	0	6
	0.87	0	5.26
Total No of sample=633	03	01	21
Percentage	0.47	0.15	3.31

Pulmonary Adenocarcinoma

The overall occurrence of this condition was observed in 3 cases (0.47 per cent) and individually occurrence of this condition was observed in Udaipur, Chittorgarh and Rajsamand as 0.54, 0.65 and 0.87 per cent, respectively. A higher occurrence was reprobated by Dadhich, H. (1993) as 1.75 per cent. Grossly, lungs were heavy, up to three times their normal size. Airways were filled with foamy secretion of neoplastic cells. Lungs contain irregularly sized, coalescing, bulging, white nodules. Portion of the lung that were not hepatized showed marked alveolar pulmonary emphysema (fig. 1). Microscopically, there was proliferation of bronchiolar and alveolar wall acini like pattern leading to papillary like projection in the lumina (fig. 2). Bronchi and bronchioles showed the presence of exudates and peribronchiolar fibrosis. The outstanding lung lesion was the marked hyperplasia and hypertrophy of the septal cells (fig. 3). Alveolar walls are completely covered with one or more layer of septal cells, and at times the entire alveolus was filled with these cells. These observations are in agreement with the earlier findings of Sonwane *et al.* (2016) [15], Alharbi *et al.* (2012) [2] and Sayyari *et al.* (2012) [13].

Small Cell Carcinoma

The overall occurrence of this condition was observed in 1 case (0.15 per cent) and individually occurrence of this condition was observed only in Dungarpur 0.54 per cent. A similar occurrence was recorded by Sharma D. (1995) [14] as 0.13 per cent. A higher occurrence was recorded by Ferdousi *et al.* (2008) [6] as 3.3 per cent. Grossly, lungs are enlarged, heavy and contain grey nodules. In later stage lungs diffusely in filtered by neoplastic cells (fig. 4). Microscopically, loosely arranged packets of small cells separate by a thin stroma neoplastic cells have a scant cytoplasm and may be round (resembling lymphocyte), fusiform ("oat cells") or polygonal were present (fig. 5). The recorded observations well to those described by Jubb and Kennedy (2007) [9] and Sharma Dinesh (1995) [14].

Pulmonary Hydatidosis

The overall occurrence of this condition was observed in 21 cases (3.31 per cent) and individually occurrence of this condition was observed in Udaipur, Dungarpur, Chittorgarh and Rajsamand as 2.71, 3.29, 2.61 and 5.26 per cent, respectively. A similar occurrence was recorded by Dadhich, H. (1993) as 3.8 per cent. A higher occurrence was reported by Ahmed *et al.* (2006) [1] as 13.68 per cent **Grossly**, the lung had numerous thick, opaque, hard, fluid filled hydatid cyst. The Cut surface showed a broad meshwork containing irregular chamber (figs. 6&7). Microscopically, the histopathological section of the affected lungs revealed

laminated hyaline layer infiltrated with leucocytes and surrounded by thick coat of granulation tissue causing fibrosis. The cysts caused progressive focal pressure atrophic lesions at the sites of predilection, resulting in atelectasis, desquamation of bronchial epithelium and inter alveolar haemorrhage (figs.8&9). These observations are in agreement with those findings of Iqbal *et al.* (2012) [8], Getachew *et al.* (2012) [7] and Jubb and Kennedy (2007) [9].



Fig 1: Gross picture of lung cut section showing pulmonary adenocarcinoma, multiple small greyish nodule in affected portion.

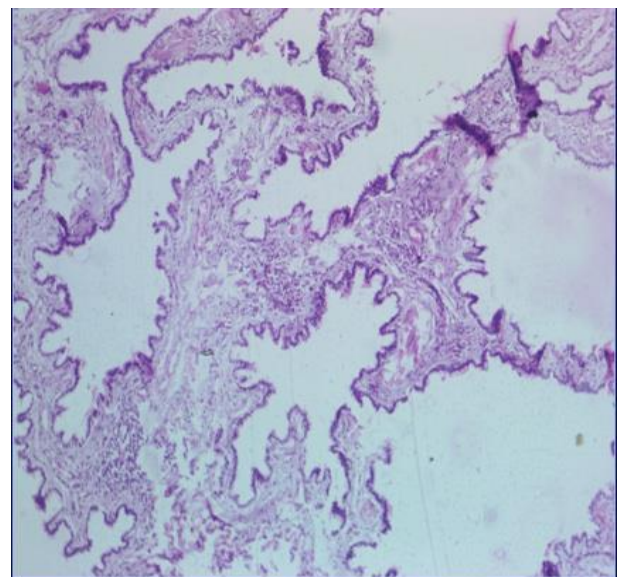


Fig 2: Microphotograph of lung showing pulmonary adenocarcinoma, proliferation of bronchiolar and alveolar wall acini like pattern, leading to papillary like projection in the Lumina.-H&E, 10x.

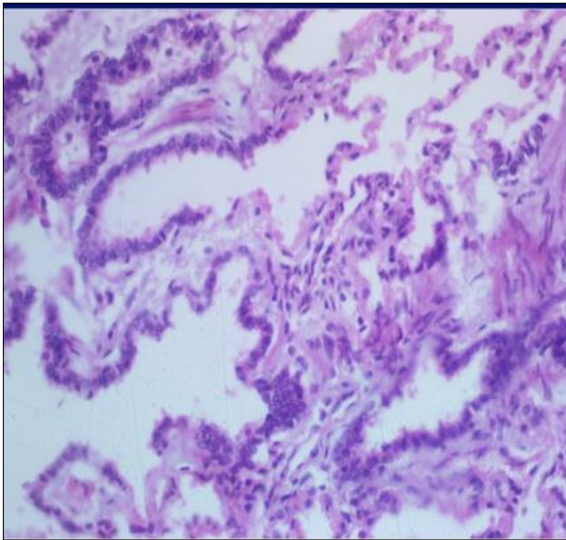


Fig 3: Microphotograph of lung showing pulmonary adenocarcinoma, proliferation of bronchiolar and alveolar wall acini like pattern, leading to papillary like projection in the Lumina.-H&E, 40x.

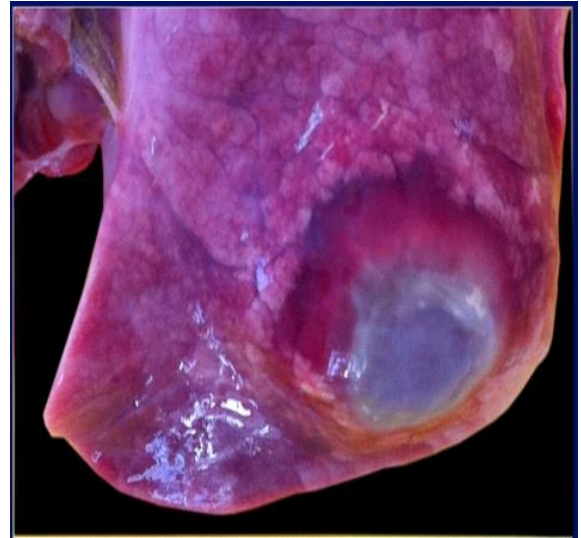


Fig 6: Gross picture of lung showing hydatid cysts embedded in the lung tissues, ranging from 1.5 to 6 cm in diameter.

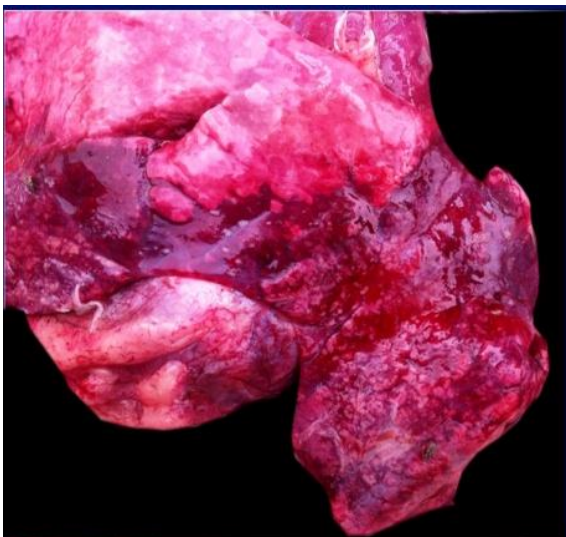


Fig 4: Gross picture of lungs showing small cell carcinoma, consolidated, hemorrhagic nodular appearance.

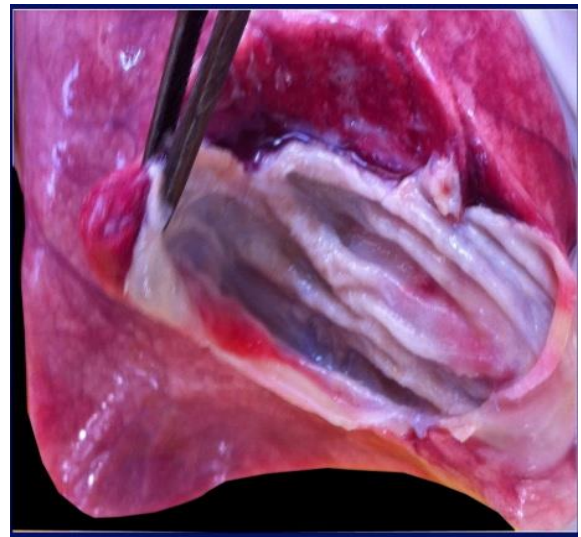


Fig 7: Gross picture of cut surface of cyst in lung showing a broad meshwork containing irregular chamber.

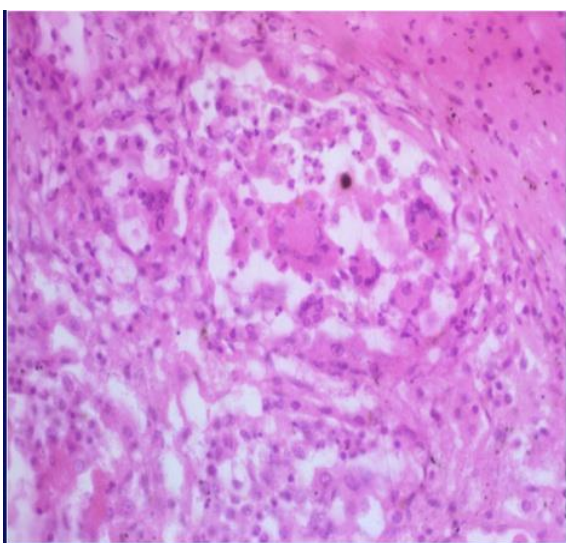


Fig 5: Microphotograph of lung showing small cell carcinoma, presence hyperchromatic nuclei, and formation of giant cells. H&E, 40x.

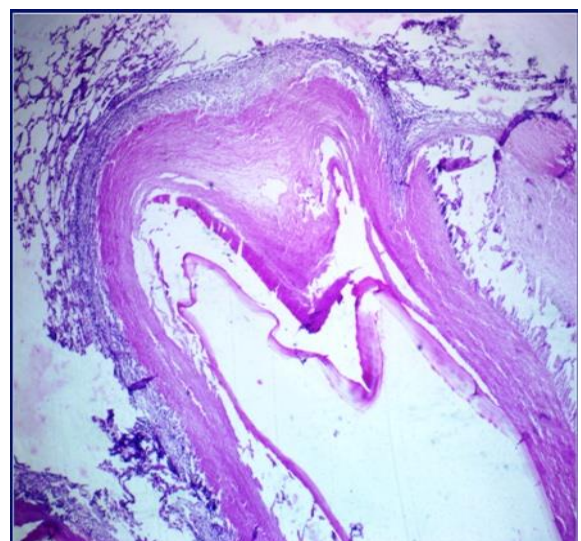


Fig 8: Microphotograph of lung section showing pulmonary hydatidosis, cyst wall containing laminated layers of hyaline infiltrated with leukocytes and surrounded by thick coat of fibrotic tissue. H&E, 4x.

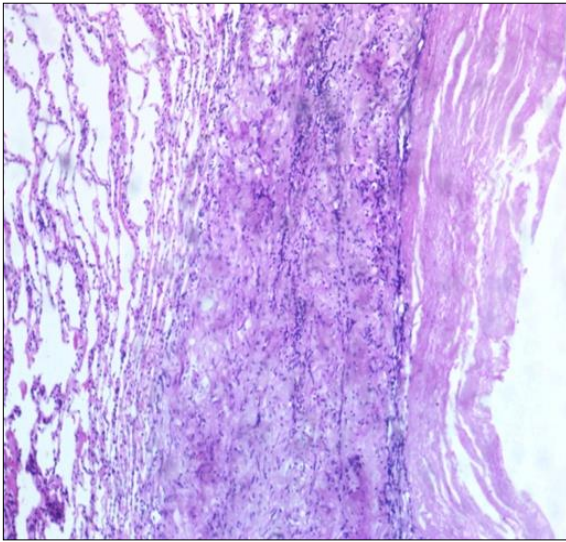


Fig 9: Microphotograph of lung section showing pulmonary hydatidosis, cyst wall contains laminated layers of hyaline infiltrated with leukocytes and surrounded by thick coat of fibrotic tissue. H&E, 10 x.

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