



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2019; 7(2): 410-412

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Received: 08-01-2019

Accepted: 11-02-2019

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Pulmonary and hepatic cell carcinoma in a rabbit

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Abstract

The present study describes a rare case of pulmonary and hepatic cell carcinoma in a rabbit which was presented for necropsy to the Department of Pathology, College of Veterinary Science, Korutla. Grossly, lungs revealed the presence of multiple, firm, greyish - white nodules of variable size in almost all the lobes. Whitish metastatic nodules also invaded into pleura and intercostal muscles. A hard whitish mass measuring 5x4 cm size was attached to the liver. Microscopically lung showed a well circumscribed mass composed of proliferating neoplastic epithelial cells forming irregular papillary structures. Alveoli were filled with clusters of tumour epithelial cells with large and hyperchromatic nuclei. Mitotic figures and giant cells were noticed and there was a marked nuclear pleomorphism. In the liver, the neoplastic cells showed hyperchromatic nuclei and mitotic figures. Based on gross and characteristic microscopic findings, the tumour was diagnosed as pulmonary and hepatic cell carcinoma.

Keywords: Hepatic carcinoma, mitotic figures, pulmonary carcinoma, rabbit

1. Introduction

In rabbits, the incidence of cancer is less in comparison with other mammalian species. Tumours may develop in any of the body part in rabbits. The most common tumour in rabbits is uterine adenocarcinoma [1]. Lung tumours are not commonly seen in rabbits. They affect the tissue of the respiratory system. The main type of lung tumour in rabbits is pulmonary adenocarcinoma. Small benign primary lung fibropapillomas were reported in aging rabbits [2]. In domestic animals frequently reported primary lung tumours are broncho alveolar adenocarcinomas [3].

Majority of the reports of primary gastrointestinal tumours in rabbits involve the liver [4]. Lymphoma, bile duct adenoma and carcinoma are among the most common types of tumours described in the rabbit liver [5]. Tumours in other parts of the body, such as uterine tumours may spread to the liver in rabbits [6]. Liver tumours have a poor prognosis in rabbits.

Present communication describes a rare case of pulmonary and hepatic cell carcinoma in a rabbit which was diagnosed on the basis of macro and microscopic lesions.

2. Materials and Methods:

A rabbit from Institutional livestock farm complex (ILFC), College of Veterinary Science, Korutla was presented for postmortem examination to the Department of Veterinary Pathology, College of Veterinary Science, Korutla. A detailed necropsy was performed and the gross lesions were carefully recorded. In affected rabbit, nodular tumour growths were observed on lung and liver. Respected tissue samples from the tumour masses were collected in 10% neutral buffered formalin for histopathological examination. After fixation in 10% neutral buffered formalin for 24 hours, tissues were washed in running tap water for overnight, dehydrated in ascending grades of alcohol, cleared in xylene and then embedded in paraffin. By using L shaped moulds, rectangular paraffin blocks were made, 5µm thick sections were cut with a semi automatic microtome and then stained with Haematoxylin and Eosin as per the standard procedure [7].

3. Results

3.1 Gross lesions: On postmortem examination, the condition of the carcass was poor, visible mucus membranes were pale and mucoïd discharges were noticed in nostrils. Grossly, lungs were pale pink colored. Multiple, variable sized, greyish- white and hard nodular growths were noticed in almost all the lobes of the lung.

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Distinct whitish metastatic nodules were invaded into pleura and intercostal muscles (Fig. 1 A). Cut surface of the nodule showed greyish white firm areas. Moderate levels of froth mixed with mucus was found in lumen of trachea and bronchi. Liver was enlarged and multiple whitish raised firm areas were found on it. A well circumscribed large whitish nodular mass measuring 5x4 cm size was attached to the liver (Fig. 1 B) which on incision revealed greyish white firm areas.

3.2 Histopathological Lesions: On histopathological examination, the sections from lung revealed a well circumscribed mass with irregular papillary projections composed of proliferating neoplastic epithelial cells (Fig. 2). There was a sharp demarcation between normal lung

parenchyma and the tumour mass by a layer of fibrous tissue. Alveoli are partially filled with tumour epithelial cells. The nuclei of neoplastic cells were large, vesicular, hyperchromatic and bizarre shaped. In certain areas compression of alveoli resulted in decrease in alveolar luminal space and there was slight fibrous connective tissue proliferation. The tumour cells showed increased nucleus: cytoplasmic ratio and there was a marked nuclear pleomorphism. Numerous mitotic figures and few giant cells were noticed (Fig. 3). In liver, there was loss of normal architectural arrangement of portal triads and the proliferating neoplastic cells are poorly differentiated. The tumour cells showed hyperchromatic nuclei, frequent mitotic figures, nuclear pleomorphism and moderate amount of fibrous connective tissue proliferation was also noticed (Fig. 4).

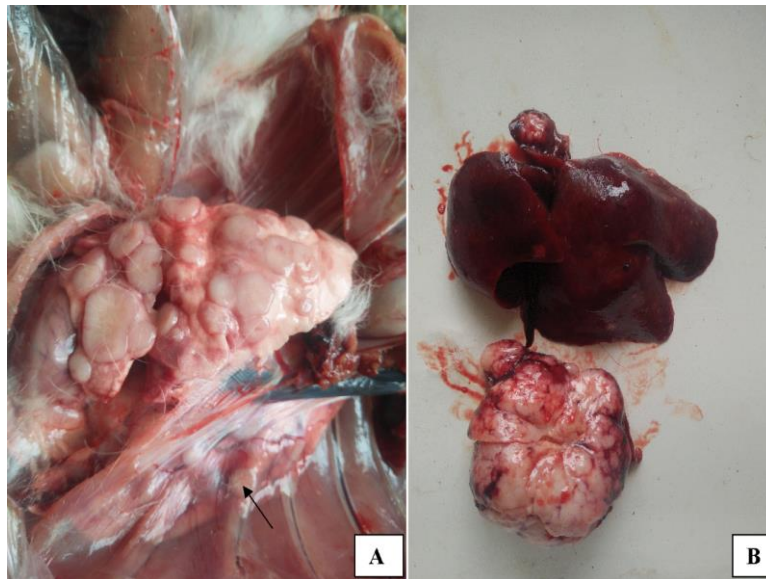


Fig 1 A: Multiple, variable sized, grayish- white, hard nodular growths on lung and distinct whitish metastatic nodules in pleura and intercostal muscles (arrow).
B: Multiple whitish raised firm areas and a well circumscribed large whitish nodular mass measuring 5x4 cm size attached to the liver.

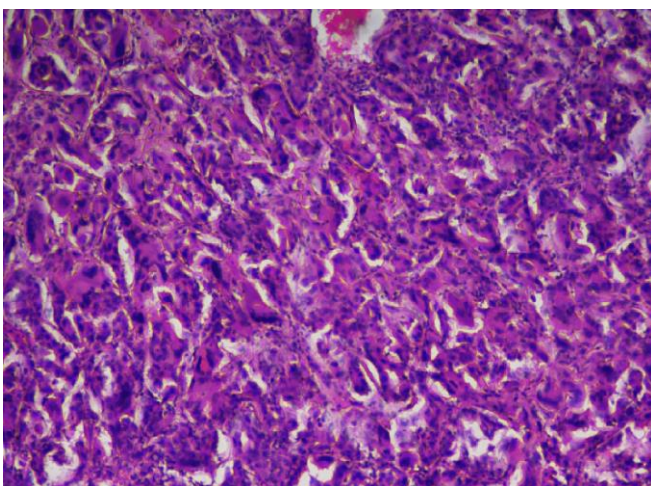


Fig 2: Lung section showing irregular papillary projections composed of proliferating neoplastic epithelial cells. H&E x10

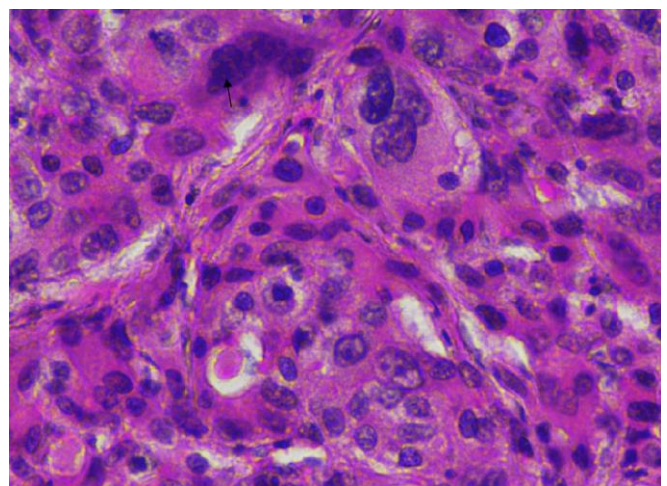


Fig 3: Lung section showing tumour epithelial cells with marked nuclear pleomorphism and few giant cells (arrow). H&E x40.

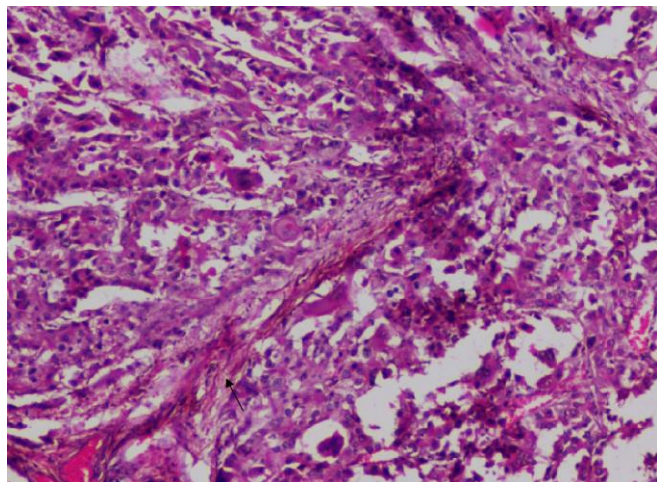


Fig 4: Liver section showing poorly differentiated proliferating neoplastic cells and moderate amount of fibrous connective tissue proliferation (arrow). H&E x10.

4. Discussion

Histologically, pulmonary carcinomas are classified as bronchial, alveolar or broncho alveolar carcinomas among which adenocarcinomas are more predominant [8]. Primary pulmonary carcinomas are rare in rabbits. Cooper and co-workers [2] reported primary lung tumours in 14% of aged rabbits and these tumours were incidental, not observed grossly and appeared to develop within the alveolar ducts. The distribution pattern of neoplastic disease in companion animals could be similar with lagomorphs but there are only a few reports in the literature regarding rabbit tumours [9]. In the present case, the gross and histopathological findings in lungs are in accordance with earlier reports in dogs [10-13]. In present study, the lung sections revealed irregular papillary projections comprised of proliferating neoplastic cells. These observations were similar with the previous reports [12, 13]. Teshima and co-workers [14] reported a case of hepatocellular carcinoma in a young dog. In the present case, the microscopic lesions in the liver are in agreement with the earlier report [14]. Surgical resection is the treatment of choice for many tumours in rabbits but most often the metastatic disease carries a grave prognosis [15]. In present case, the tumour was originated in lungs and metastasized to other visceral organs like liver, pleura and intercostal muscles either through blood or lymph. Pneumonia and pulmonary haemorrhage were developed due to lung carcinoma that resulted in respiratory failure and finally death of the rabbit.

5. Conclusion

On the basis of gross and characteristic histopathological findings the present case was confirmed as pulmonary and hepatic cell carcinoma which is an uncommon tumour in rabbits and it concludes that metastatic lung cancers having a poor prognosis and if not treated in early stages by surgical excision that often results in death of the animals.

6. Acknowledgements:

The authors are thankful to the PV Narasimha Rao Telangana Veterinary University (PVNRTVU), Rajendranagar, Hyderabad, Telangana for providing necessary facilities.

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