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CASE REPORT

Case of hepatocellular carcinoma in horse-report

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ABSTRACT

Hepatocellular carcinoma (HCC) in horses is an uncommon hepatic neoplasm often presenting with vague clinical signs and diagnosed postmortem. This case report describes the clinical presentation, pathological findings and histopathological confirmation of hepatocellular carcinoma with concurrent pericardial haemorrhage in an adult horse. The animal exhibited nonspecific symptoms including lethargy, anorexia and respiratory distress prior to death. Clinical deterioration was rapid and the horse succumbed despite supportive treatment. A complete postmortem examination was performed revealing a markedly enlarged and nodular liver with pale to tan patches on surface, unclotted blood within the pericardial sac and heavy edematous lungs with frothy exudate. Microscopic examination of hepatic tissue revealed neoplastic hepatocytes arranged in trabecular and pseudoglandular patterns with marked cellular atypia and areas of necrosis consistent with hepatocellular carcinoma. The pericardium showed extensive haemorrhage and fibrin deposition while pulmonary sections exhibited alveolar congestion and emphysema. The histopathological findings confirmed a diagnosis of hepatocellular carcinoma with associated pericardial haemorrhage. This report highlights a rare multisystemic manifestation of hepatic neoplasia in equines and underscores the importance of thorough postmortem and histopathological investigations in diagnosing complex systemic conditions.

Keywords: Equine, Hepatocellular carcinoma, Histopathology and Pericardial haemorrhage.

INTRODUCTION

Hepatic neoplasms in horses are infrequently diagnosed and often remain clinically silent until they reach an advanced stage making them a diagnostic challenge in equine practice. Among these, hepatocellular carcinoma (HCC) is a rare but aggressive malignant tumour originating from hepatocytes with limited documentation in veterinary literature[1]. Hepatocellular carcinoma in horses may present with vague, nonspecific signs such as weight loss, lethargy, jaundice or may even remain asymptomatic until sudden death occurs[2]. In horses, hepatic neoplasms are infrequently diagnosed often due to their deep anatomical location, the liver's significant functional reserve and the non-specific clinical signs that can accompany hepatic disease[3]. Diagnosis is typically achieved post-mortem supported by gross pathological findings and histopathological examination of hepatic tissue[4].

Equine HCC is known for its potential to metastasize and invade surrounding tissues but concurrent involvement of other vital organ systems such as the cardiovascular and respiratory systems is exceedingly rare[5].

Comprehensive diagnostic efforts including detailed necropsy and histopathological evaluation are crucial in elucidating such conditions and expanding the current understanding of equine neoplastic pathology[7].

Despite the severity and clinical significance of these findings, there is a paucity of case-based reports describing hepatocellular carcinoma with associated cardiorespiratory pathology in horses. The rarity and vague clinical presentation make antemortem diagnosis of HCC particularly challenging and definitive diagnosis is frequently established post-mortem through gross pathological and histological examination[8]. This case report presents a rare instance of hepatocellular carcinoma in a horse with concurrent pericardial haemorrhage. The report aims to detail the clinical signs, gross pathology and microscopic lesions highlighting the importance of thorough post-mortem evaluation in cases of unexplained equine mortality.

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CASE PRESENTATION

The present case study involves an adult male horse of mix breed of age 8 years 7 months submitted to the Department of Veterinary Pathology, Bihar Veterinary College, Patna (Bihar, India) for post-mortem examination (Fig.1). The animal had a reported history of progressive weight loss, reduced appetite, intermittent lethargy and mild respiratory distress. The animal had shown signs of clinical deterioration over the preceding week and died suddenly despite of symptomatic treatment. No history of trauma or previous hepatic disease was noted.

For histopathological analysis, representative tissue samples from the liver and heart

were fixed in 10% neutral buffered formalin and processed using standard paraffin embedding techniques.

RESULTS AND DISCUSSION

Postmortem and histopathological findings confirmed a diagnosis of hepatocellular carcinoma (HCC) with concurrent pericardial haemorrhage. Gross examination of the liver revealed marked enlargement with multiple pales to tan, firm nodular masses of varying sizes scattered throughout the hepatic parenchyma (Fig. 2). The pericardial sac was distended with dark, unclotted blood. Lungs appeared edematous, heavy and failed to collapse with frothy, reddish fluid evident in the trachea and primary bronchi (Fig. 4).

Microscopic examination of liver sections revealing neoplastic hepatocytes arranged in irregular trabecular patterns with anisokaryosis, hyperchromatic nuclei, prominent nucleoli (Fig. 5). It also reveals clusters of atypical hepatocytes with pleomorphic, hyperchromatic nuclei, disorganized architecture and intracellular pigment along with prominent nucleoli (Fig. 6). Histological section of heart of Horse reveals cardiac muscle fibres with numerous red blood cells extravasated in between (Fig. 7). Histological section of lungs of Horse shows congestion and emphysema of alveoli along with inflammatory cells infiltration (Fig. 8).

Haematoxylin and eosin-stained liver sections revealed disorganized hepatic architecture with neoplastic hepatocytes arranged in trabecular and pseudoglandular patterns. The neoplastic cells exhibited marked nuclear pleomorphism, hyperchromasia, prominent nucleoli and frequent mitotic figures consistent with hepatocellular carcinoma. Pericardial sections showed diffuse haemorrhage with fibrinous exudate and scattered inflammatory cells.

These findings were consistent with primary hepatocellular carcinoma, a rare hepatic malignancy in equines that has been previously described in individual case reports and retrospective studies[2,5]. The nodular hepatic lesions and disrupted histoarchitecture, along with typical cytological features of malignant hepatocytes confirm the diagnosis[1].

Although direct neoplastic invasion of the pericardium was not evident histologically, similar

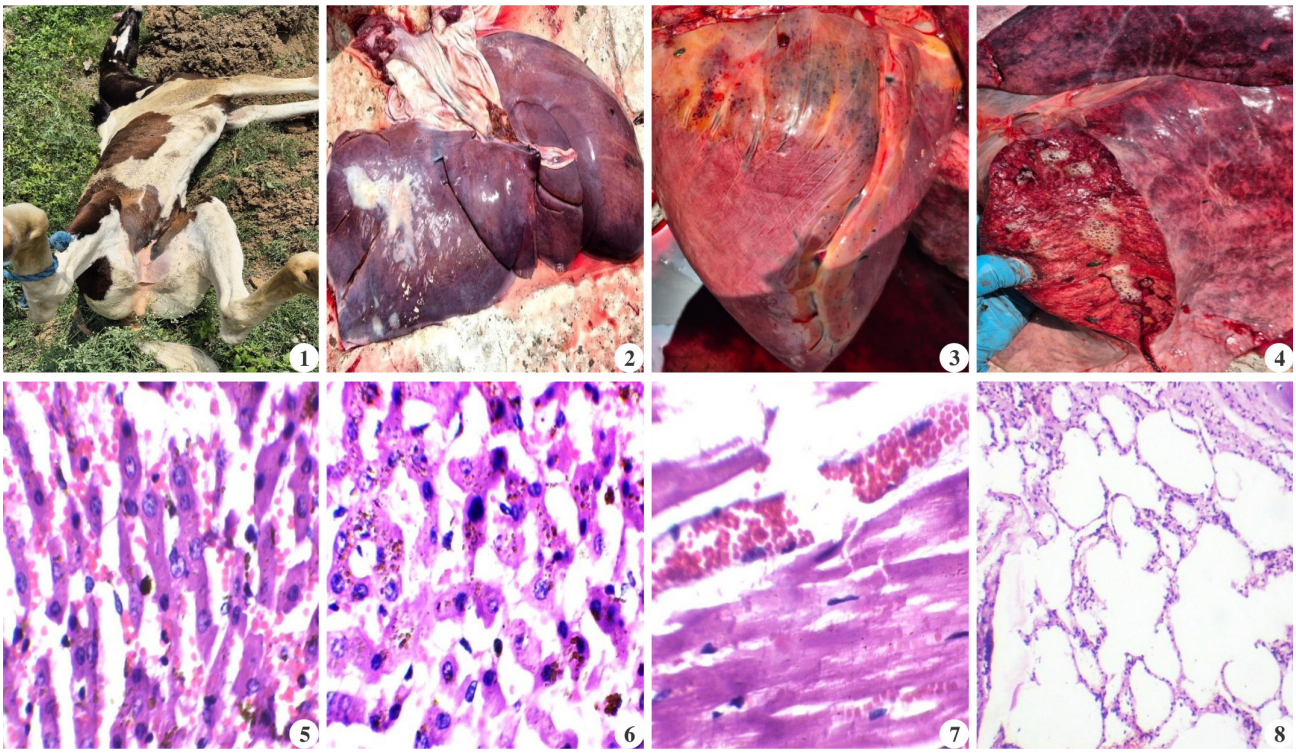

Fig.1. Gross photograph of horse with poor body condition and mild abdominal distension; **Fig.2.** Markedly enlarged liver with multiple pales to tan nodules of varying sizes; **Fig. 3.** Heart showing petechial haemorrhages on the epicardium; **Fig.4.** Lungs showing severe congestion with dark red, firm and non-collapsing parenchyma and frothy exudates., **Fig.5.** Histological section of liver of horse (H&E,400x) revealing neoplastic hepatocytes arranged in irregular trabecular patterns with anisokaryosis, hyperchromatic nuclei, prominent nucleoli; **Fig.6.** Histological section of liver of horse (H&E,400x) reveals clusters of atypical hepatocytes with pleomorphic, hyperchromatic nuclei, disorganized architecture and intracellular pigment along with prominent nucleoli; **Fig.7.** Histological section of heart of horse (H&E,400x) revealing cardiac muscle fibres with numerous red blood cells extravasated in between; **Fig. 8.** Histological section of lungs of horse (H&E,100x) showing congestion and emphysema of alveoli along with inflammatory cells infiltration.

presentations have been documented in horses in association with terminal neoplastic conditions[7].

Previous studies have indicated that hepatocellular carcinoma in horses may be clinically silent until the disease is advanced, with nonspecific signs such as weight loss, lethargy and respiratory distress often being the only indicators[9]. The rapid clinical decline and sudden death observed in this case reflect the decompensated systemic response to multisystemic compromise induced by hepatic neoplasia. The absence of gross or microscopic gastrointestinal lesions ruled out enteric diseases or parasitic causes of systemic illness.

Although hepatocellular carcinoma is well documented in small animals and humans, its occurrence and associated complications in horses remain underreported. The combined presentation of hepatic neoplasia with concurrent pericardial and pulmonary pathology as seen in this case represents a rare and diagnostically challenging condition that necessitates comprehensive postmortem evaluation and histological analysis[10].

In equine practice, early diagnosis of hepatic tumours is hindered by the deep anatomical location of the liver and the lack of specific clinical signs[11]. Ultrasonography and liver biopsy may aid antemortem detection in suspected cases, but histopathology remains the gold standard for definitive diagnosis[12]. While therapeutic options for equine hepatic neoplasms are limited, understanding their pathogenesis and systemic impact is essential for accurate prognosis and case management.

The present case underscores the importance of integrating clinical history, gross pathology and microscopic evaluation in diagnosing rare multisystemic manifestations of neoplastic disease in horses. Routine postmortem analysis remains a critical tool in uncovering underlying causes of unexpected equine mortality and contributes valuable insights to veterinary oncology.

CONCLUSION

This case highlights the importance of thorough postmortem examination in unexplained equine deaths and emphasizes histopathological analysis as a definitive diagnostic tool. Early recognition of hepatic disease, even in the absence of specific signs along with comprehensive diagnostic work-up is essential for timely intervention and understanding of rare neoplastic conditions in equine practice.

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