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Concurrent traumatic pericarditis and liver rupture in a Holstein Friesian crossbred cow: Pathological insights

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Abstract

An adult Holstein Friesian (HF) crossbred cow was referred to the Department of Veterinary Pathology, Madras Veterinary College, Chennai, for necropsy examination. Externally, the cow showed pale conjunctival mucous membranes and abdominal distension. Internally, the abdominal cavity was filled with blood and clotted masses. The liver exhibited a 15 cm-long linear rupture with blood clots along the margins. The pericardium was markedly thickened, and the pericardial sac contained approximately 100 ml of thick, brownish, purulent exudate. The inner pericardium had irregular corrugations, while the epicardium was covered by a thick, yellowish-white fibrous layer. The ventral epicardium revealed a fibrous tract communicating between the pericardium and epicardium. Extensive fibrin deposition on the heart produced a “bread-and-butter” appearance with adhesions to adjacent tissues. Based on gross necropsy findings, it was concluded that the cow died due to traumatic pericarditis, which precipitated rupture of the fragile liver, culminating in hypovolemic shock.

Keywords: Hypovolemic shock, fibrinous pericarditis, liver rupture, cow, pathology

Introduction

Traumatic pericarditis is a common condition in bovines, particularly those reared in urban or peri-urban environments where ingestion of metallic foreign bodies is frequent. After ingestion, these foreign objects pass from the rumen to the reticulum and may penetrate the diaphragm, damaging the pericardium and adjacent thoracic structures (Ibrahim and Gomaa, 2016) [8]. The resulting inflammatory response produces chronic exudates and fibrous adhesions, leading to impaired cardiac function (Braun *et al.*, 2007; Braun, 2009) [6, 5]. In advanced cases, secondary bacterial infection may cause septicemia and death (Grunder, 2002; Braun, 2009) [7, 5].

Clinically, affected animals exhibit jugular vein distension, brisket edema, and signs of cardiac insufficiency (Grunder, 2002) [7]. The disease also leads to economic losses due to costly treatments and decreased productivity (Aref and Abdel-Hakim, 2013) [2]. Pregnant animals, especially in the last trimester, are more susceptible due to increased intra-abdominal pressure exerted by the gravid uterus on the diaphragm (Fubini and Divers, 2008) [6].

This case report presents the gross pathological findings of a Holstein Friesian crossbred cow that succumbed to traumatic pericarditis complicated by liver rupture and hypovolemic shock.

Materials and Methods

An adult cow exhibiting anorexia and collapse was admitted to the Large Animal Teaching Hospital, Madras Veterinary College, Chennai. Following death, the carcass was submitted to the Department of Veterinary Pathology for postmortem examination. Detailed necropsy was performed, and lesions in the thoracic and abdominal organs were documented to determine the cause of death.

Results and Discussion

Gross Findings

The carcass showed emaciation and pallor of the subcutaneous tissues (Fig. 1).

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The abdominal cavity contained a large quantity of free and clotted blood, covering most visceral organs (Fig. 2). The liver had an irregular linear rupture on the dorsal surface, approximately 15 cm in length, with blood clots adhering to the ruptured margins (Fig. 4). On cut section, hepatic parenchyma appeared pale reddish.

Thoracic Cavity

About one liter of straw-colored fluid was present in the thoracic cavity. Fibrinous adhesions were noted between the pleura and the inner thoracic wall (Fig. 3). The pericardium was markedly thickened and contained about 500 ml of reddish, purulent exudate (Fig. 5). The epicardium was covered with thick fibrous tissue, and a fibrous tunnel was observed on the ventral cardiac surface, suggesting the path of foreign body penetration (Fig. 6).

Such findings align with earlier reports describing fibrinous or constrictive pericarditis caused by penetrating foreign bodies originating from the reticulum (Abdelaal *et al.*, 2009; Khalphallah *et al.*, 2017) [1, 9]. The chronic inflammatory process likely led to pericardial thickening and fluid accumulation (Kumar *et al.*, 2012; Yildiz *et al.*, 2019) [10, 14].



Fig 1: HF cow showed emaciation



Fig 2: Abdominal cavity contained blood and blood clots covered abdominal organs



Fig 3: Left inner thoracic cavity showed adhesion with lung

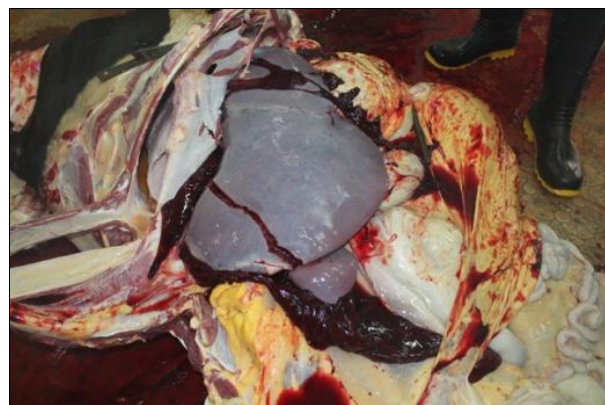


Fig 4: Liver showing irregular linear rupture and blood clots



Fig 5: Thickened pericardium and epicardium. Pericardial sac contains reddish purulent content



Fig 6: Thick fibrinous tissue in heart and canal for foreign body penetration track

Cause of Death

The cow, already debilitated by chronic traumatic pericarditis, likely experienced secondary hepatic rupture due to increased intra-abdominal pressure or mechanical stress during terminal stages. The resulting massive internal hemorrhage caused hypovolemic shock, leading to death.

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Conflict of Interest

Not available.

Financial Support

Not available.

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