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Pathology of snake bite in cow

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Abstract

Pathology of gross and histopathological lesions are being described in the cow inflicted with a snake bite. The lesions were suggestive of snake bite of Viperidae family, as the lesions were hemotoxic as evidenced in heart, lungs and trachea besides sludgeing of blood.

Keywords: Hemorrhage, muscle degeneration, sludge blood, viperidae family

Introduction

Venomous snake bites are responsible for more than 1 lakh animal death in the world annually (Bucheri *et al.,* 1968). The families comprising of venomous snakes are: Viperidae family (include Russel's viper, rattle snake and puff adder), Elapidae family (include cobra, krait, mamba and coral snakes), Crotalinae family (pit vipers), Hydrophinae family (sea snakes) and Colubridae family (Boomslang) (Catcott, 1979; Clarks and Clarke, 1967). The venom of snakes of families Viperidae, Crotalidae and Colubridae is predominantly hemotoxic and causes primarily local pain, swelling, edema and oozing of blood from the site of bite (Clarks and Clarke, 1967; Kanjanabuch and Sitprija, 2008**;** Nelson, 1989) and death occurs within 2-4 days (Nelson, 1989; Radostits *et al*., 2000; Vani Prasad and Koley, 2006). The venom of snakes of family Elapidae is predominantly neurotoxic which causes paralysis and death due to respiratory failure within 20 minutes to 6 hours (Nelson, 1989; Radostits *et al*., 2000; Vani Prasad and Koley, 2006).

Materials and Methods

A cow was presented for necropsy at post-mortem hall of Department of Veterinary Pathology, GADVASU, Ludhiana with a history of snake bite. The owner found snake in crushed state alongside the cow. The cow was treated first by local veterinarian and brought to Veterinary Clinics, GADVASU, Ludhiana where it succumbed to snake bite, prior to start of any treatment. A thorough necropsy was conducted and tissue samples of lung, trachea, buccal mucosa, heart and liver were collected in 10% formalin for histopathological examination. The tissue samples after making 5μ thick sections were processed for routine Hematoxylin and Eosin staining protocol as per standard protocol of Luna (1968).

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Results

A necropsy of cow revealed presence of pair of 2 mm elliptical, red puncture wounds which were 0.8cm apart (presumptive snake bite wounds) on the ventral buccal mucosa in the oral cavity (Fig. 1). The sub-cutis of buccal mucosa also showed the petechial hemorrhages. There were multifocal petechial to ecchymotic hemorrhages on the peritoneum (Fig. 2), epicardial (Fig. 4) and the sub-endocardial surface of heart, besides, numerous pale linear streaks were evident on the right ventricular myocardium. Variable sized hemorrhages were observed on the lung (Fig. 5) and liver parenchyma. Marked ecchymotic to suffusive hemorrhages were discernible in the lumen of trachea (Fig. 3) which also revealed frothy contents.

The histopathological examination of buccal mucosa revealed an area of degeneration of buccal epithelium evident as an area of the shape of inflicted tooth (cast) (Fig. 6) in the mucosa. The sub-epithelial tissue was having evidence of marked diffuse hemorrhage (Figs. 7 & 8). A characteristic lesion in the buccal mucosa was the evidence of sludged blood in the vessels besides smearing of RBC's to the vessel wall (Fig. 9). The areas in vicinity of snake bite also exhibited skeletal muscle

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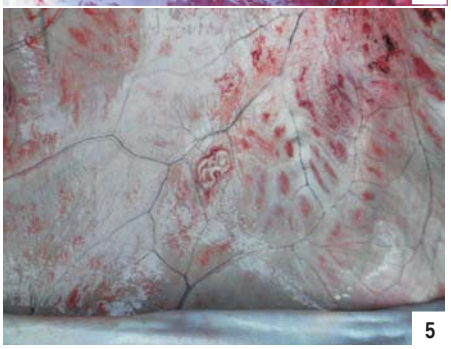
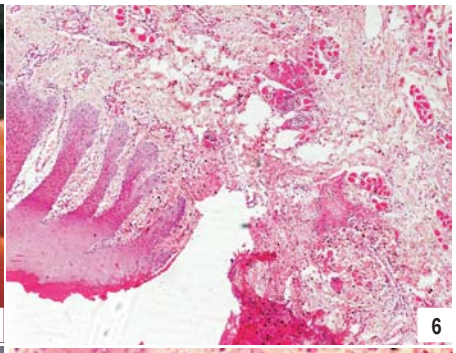
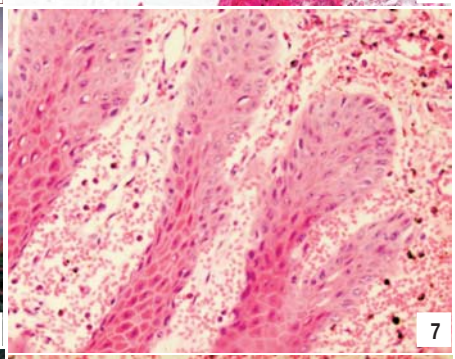
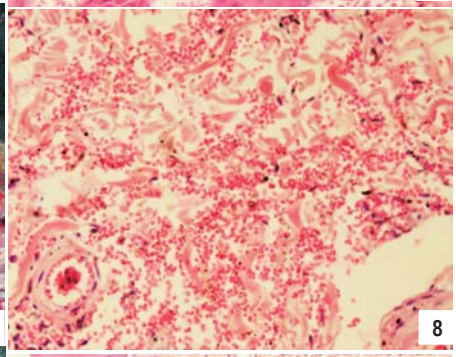
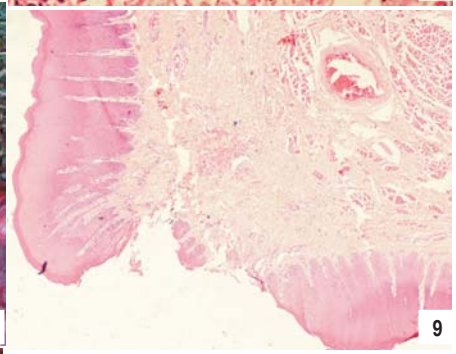
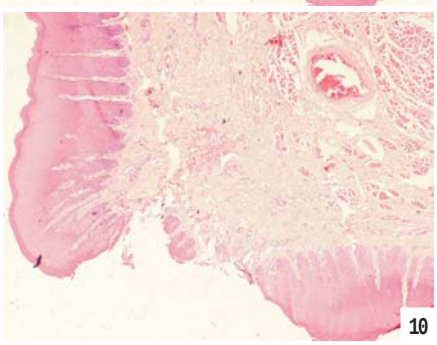







Fig.1: Snake bite lesions on the ventral buccal mucosa in the oral cavity.

Fig.2: Multifocal petechial to ecchymotic hemorrhages on the peritoneum.

Fig.3: Marked hemorrhages in the lumen of trachea.

Fig.4: Multifocal petechial to ecchymotic hemorrhages on the epicardium of heart

Fig.5: Marked hemorrhages on the lung

Fig.6: Buccal epithelium evident as an area of the shape of inflicted tooth (cast) in the mucosa. H & E X 75

Fig.7: Areas of buccal sub-epithelial tissue showing marked diffuse hemorrhage. H& E X 150

Fig.8: Submucosal areas showing marked diffuse hemorrhage. H& E X 150

Fig.9: Buccal mucosa revealed sludged blood in the vessels besides smearing of RBC's to the vessel wall. H & E 75

Fig.10: Skeletal muscle degeneration characterized by homogenization of skeletal muscles and by mild focal areas of infiltration of mixed cell types (neutrophils and macrophages). H & E 150

degeneration characterized by homogenization of skeletal muscles and by mild focal areas of infiltration of mixed cell types (neutrophils and macrophages) (Fig.10). Section of heart revealed areas of degeneration of myocardium where muscles reveal loss of striations and homogenization. There was evidence of vascular

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compromise with marked congestion of alveolar capillaries, multifocal hemorrhage in lung parenchyma besides marked edema of lung. Marked multifocal petechial hemorrhages as evidenced on gross pathology in trachea and peritoneum were confirmed at histopathology.

Discussion

The gross and histopathological observations in the present case of snake bite are in consonance with the pathological changes reported earlier in viper bites where hemolysis, myonecrosis, coagulopathy, thrombocytopenia, nephrotoxicity, vasculitis, severe internal hemorrhages, thomboembolism, myocardial necrosis, damage to vasculature causing increased permeability, subcutaneous edema, pansystemic echymotic hemorrhages, shock and death (Clarks and Clarke, 1967; Radostits et al., 2000; Vani Prasad and Koley, 2006) has been reported.

The putative effects of snake bite depends upon the size and species of the snake involved, the size of the animal bitten and primarily the location of the bite particularly with reference to the thickness of hair coat and quantity of subcutaneous fat (Kanjanabuch and Sitprija, 2008). Farm animals are more likely to be bitten on jaw (Leisner *et al*., 1999) as was also observed in the present study. Cattle and horses seldom die due to large size (Nelson, 1989), except when bitten on head (muzzle/ lips/ neck).

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