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Study of gross and histopathology of mesenteric lymphnodes in lymphosarcoma of large white Yorkshire swine

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Abstract

Lymphosarcoma is considered to be the most common neoplasm of the pig even more common than embryonal nephroma. In the present study, five cases of 4-5months old pigs were affected with lymphosarcoma with history of gradual decrease in body weight and anaemia. Grossly mesenteric lymphnodes were greatly enlarged and hemorrhagic. Endocardial hemorrhages, hemorrhagic patch on gastric mucosa, hemorrhagic enteritis and severe congestion of the liver, mesenteric blood vessels were noticed. Cytology revealed numerous enlarged lymphocytes with basophilic cytoplasm and increased number of mitotic figures in lymphnodes. *Pasteurella multocida* organisms were also observed in the impression smears of heart and liver. Histopathological examination revealed infiltration of numerous lymphoblasts and distortion of normal architecture in lymphnodes. Because of immunosuppressive effect of lymphosarcoma, secondary bacterial infections mainly pasteurellosis were noticed which might be the cause of sudden death.

Keywords: Gross, histopathology, mesenteric lymphnodes, lymphosarcoma, arge white Yorkshire swine

Introduction

Out of meat producing livestock species pig is one of the important species as it gives quick returns and is an efficient feed converter next to broiler. The large population of swine is continuously exposed to several diseases like swine influenza, swine fever, salmonellosis, pasteurellosis and many neoplastic diseases. Neoplastic diseases have not been widely studied in pigs, although prevalence in slaughter animals has been recorded in several countries in the past four decades. Since most swines are slaughtered at 6 months of age or younger, the most common tumors diagnosed are those that commonly occur in young animals, ie, lymphosarcoma, nephroblastoma, and melanoma (Edwards and Mulley, 1999) [6]. Lymphosarcoma is found to be the most common neoplasm of the pig even more common than embryonal nephroma (Cotchin, 1956 and Sulivian and Anderson, 1959) [4, 13]. Lymphosarcoma, term applied generally to malignant neoplastic disorders of lymphoid tissue (Blood and Studder, 1988) and are often grow rapidly and invasive, but may or may not be metastatic.

Lymphoma is a type of cancer defined by a proliferation of malignant lymphocytes within solid organs such as the lymph nodes, thymus, liver, spleen and bone marrow. The lymphosarcoma also may occur in the eye, skin and gastrointestinal tract. Lymphoma can be synonymously used with lymphosarcoma. Lymphosarcoma is found to be prevalent in cattle, dogs, horse, cats, pigs and sheep.

The exact etiology has not been established for occurrence of lymphosarcoma in pigs till now. It was assumed that lymphosarcoma was found to be hereditary in nature, most probably caused by an autosomal recessive gene (Head *et al.*, 1974) [7] and a genetic predisposition was evident in inbred herds of pigs (Mc Taggart *et al.*, 1971 and Saito *et al.*, 1982) [9, 10]. Porcine lymphoma C-type particle (PLCP), an endogenous retro virus was isolated from a case of spontaneous lymphosarcoma in a pig (Busse *et al.*, 1978) [2]. It has been concluded that porcine lymphosarcoma is likely caused by a complex interaction of infectious, hereditary and environmental factors (Skavlen *et al.*, 1986) [11].

Lymphosarcoma in animals is classified based on cytology and anatomical location but binary classification can be used (Jarrett and Mackey, 1974) [8]. The cytological classification includes stem cell, histiocytic, lymphoblastic (lymphocytic poorly differentiated), prolymphocytic and lymphocytic (lymphocytic well differentiated) and Hodgkin's like lymphosarcoma.

The anatomic classification includes multicentric, thymic, alimentary, skin and solitary types. Porcine lymphosarcoma is mainly multicentric affecting lymph nodes, liver and spleen with less involvement of lungs, skin, serous membranes and other organs (Chevral *et al.*, 1969). The prevalence of lymphosarcoma in pigs is high, but the less research work was recorded. In this study post mortem findings, cytology and histopathology were used for identifying the lymphosarcoma.

Materials and Methods

The samples from a total of 5 pigs of both sexes and 4-5 months of age groups suspected for lymphosarcoma were collected from cases brought for post mortem examination at College of Veterinary Science, Tirupati.

Detailed examination of pigs was carried out for recording of gross lesions in various organs. The mesenteric lymph nodes were collected and preserved in 10 per cent neutral buffered formalin for histopathological studies. During post mortem examination, impression smear from mesenteric lymph nodes were collected, preserved, fixed and stained with Giemsa's stain for detailed cytological examination. The fixed tissues were processed by routine paraffin embedding technique and sections of 5µ thickness were cut and stained with routine Haematoxylin and Eosin method (H&E) (Culling, 1974) [5].

Results

In the present study, emaciated carcass with sunken eyes, pale conjunctival mucus membrane, erythematous blochy haemorrhages on skin especially on ears, shoulder region and ventral abdominal portions were observed externally and internally gross lesions like epicardial haemorrhages, focal congestion of lung lobes, haemorrhagic patch on gastric mucosa, haemorrhagic enteritis, enlarged, edematous, haemorrhagic mesenteric lymph nodes, on cut section of mesenteric lymphnodes no demarcation of cortex and medulla, oozing of blood, congested mesenteric blood vessels were observed. Few mesenteric lymphnodes were coalesced, which appeared as card like structure.

Impression smears of mesenteric lymph nodes revealed clusters of pleomorphic neoplastic lymphocytes and increased cellularity of neoplastic lymphocytes observed. Pleomorphic neoplastic lymphoblast cells were medium to large in size and had the large round to oval nucleus, moderate to densely clumped chromatin, prominent nucleoli 2-4 in number in each nucleus and basophilic cytoplasm. In the H & E staining of mesenteric lymph node section, moderate to severe infiltration of small to medium sized neoplastic lymphoblast cells and at places displacing the lymphoid tissue and proliferation of blood vessels were observed.

Discussion

The determination of true prevalence of the neoplasms in swine is difficult because many of the pigs die are never necropsied. Lymphosarcoma in the pigs has been rarely diagnosed clinically (Squire, 1964) but it has been diagnosed using hematological methods. diagnosis of lymphosarcoma in the live pigs was difficult, as clinical signs (anorexia, dyspnea and ataxia) mimic those of other diseases (Bostock and Owen, 1973) [1]. It should be differentiated with hog cholera, Salmonellosis, African Swinefever and acute erysipelas because of similar gross findings. But here observed enlargement of the mesenteric lymph nodes. The carcasses showed severe emaciation, sunken eyes, pale conjunctival mucus membrane and erythematous patches on ears, shoulder

region, ventral abdomen and legs. The similar findings were reported by Stevenson and Dewitt (1973) [12], who observed in a 13-month old Hampshire boar. Enlarged, edemated and hemorrhagic mesenteric lymphnodes were observed and few mesenteric lymph nodes were coalesced and formed cluster like appearance in pigs.

Intestines: Haemorrhagic enteritis



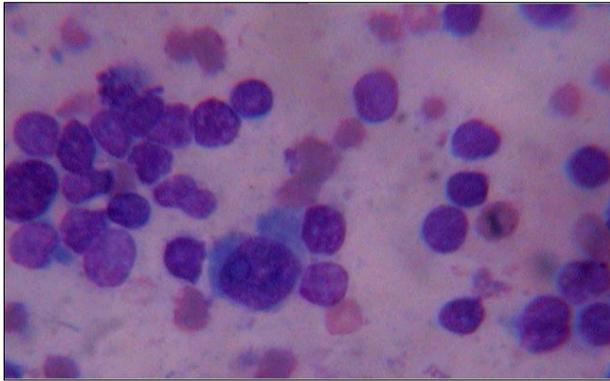
Liver: Enlargement of liver and grayish white focal lesions on the surface



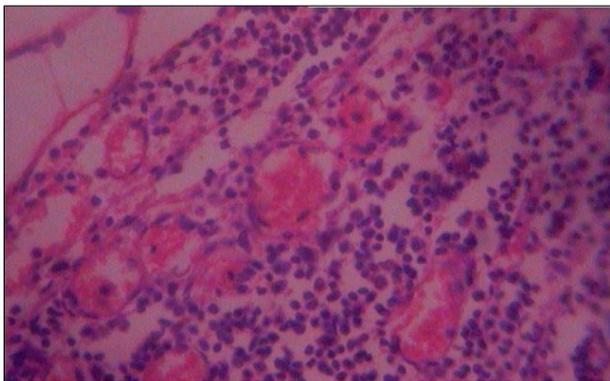
Mesenteric Lymphnodes: Soft, enlarged, edemated and hemorrhagic mesenteric lymph nodes



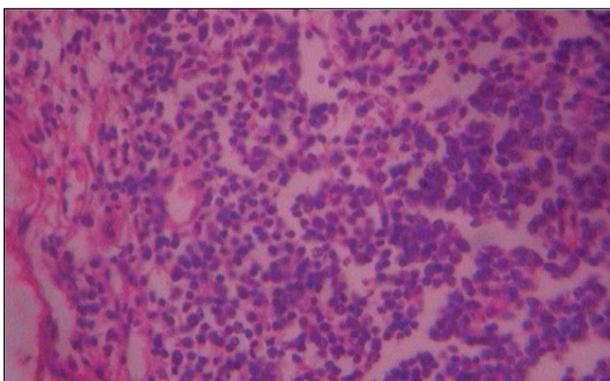
Mesenteric Lymphnode cytology: Pleomorphic neoplastic lymphoblast cells were medium to large in size and had the large round to oval nucleus, moderate to densely clumped chromatin, prominent nucleoli and basophilic cytoplasm (Geimsa's; 1000x)



Mesenteric Lymphnode Histopathology: Angiogenesis (H&E; 1000x)



Mesenteric lymph node Histopathology: Moderate to severe infiltration of small to medium sized neoplastic lymphoblast cells and at places displacing the lymphoid tissue (H&E; 1000x)



Conclusion

There is a necessity to study and identify the condition as early as possible. Advanced molecular diagnostic techniques like immunohistochemistry, PCR, Gene hybridization, Karyotyping can be advocated for confirmatory diagnosis. Further research on virological etiology needs to be focused.

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