

## Chronic diarrhea due to lymphosarcoma in an adult cow: a sporadic clinical report

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**Abstract:** The present clinical report describes a rare sporadic clinical case of chronic diarrhea due to lymphosarcoma in a 7-year-old crossbred Holstein–Friesian cattle. Diarrhea occurred due to intestinal lymphoid tissue involvement. The clinical diagnosis of lymphosarcoma was derived from peritoneal fluid aspirate, lymph node enlargement, and absence of serological and fecal evidence of any parasitic or bacterial infection. Reactive proliferative mesothelial hyperplasia in peritoneal fluid examination confirmed lymphosarcoma. The cells form numerous 3-dimensional clusters in mesothelial lymphosarcoma. Postmortem examinations confirmed visceral lymph node enlargements. A hematological examination revealed leukocytosis and a marked decrease in hemoglobin level, which reflected a severe degree of anemia. A clinical diagnosis of bovine lymphosarcoma was made, with visceral lymph node enlargement resulting in consistent chronic diarrhea in the adult cow.

**Key words:** Chronic diarrhea, lymphosarcoma, cow, needle aspirate, peritoneal fluid

### 1. Introduction

Chronic diarrhea is a costly pathologic condition affecting livestock (1). Diagnosis and therapy of chronic diarrhea is very challenging for clinicians and there is no comprehensive study on the prevalent causes of chronic diarrhea in bovines, particularly in India. Clinical experience and feedback from field practitioners show that chronic diarrhea is frequently encountered in dairy animals. It has significant impact on economic returns due to its effects on the animal's general health status and production status (1). There has been no comprehensive study on the prevalent causes of chronic diarrhea in Indian bovines, although some studies are available on horses (2). Diarrhea is an important clinical sign associated with adult lymphosarcoma in bovines, although it is not a consistent sign. Lymphosarcoma in bovines occurs in 2 different epidemiological patterns: enzootic bovine leukosis, which has a retroviral etiology, and sporadic bovine leukosis which has unknown etiology. There is an atypical form of lymphosarcoma in bovines in which there is no clinical evidence of lymphadenopathy except for the involvement of internal organs (3). The clinical signs of lymphosarcoma are usually attributable to the organ system being affected by tumor metastasis. Cattle

with lymphosarcoma most commonly show nonspecific signs of illness such as anorexia, weight loss, or fever (4). Other common signs of lymphoid neoplasia in bovines include weight loss, decreased milk production, abomasal ulceration, infertility, and enlarged lymph nodes. This disease has higher prevalence in dairy cattle than in buffaloes (5). This report describes a clinically and pathologically sporadic case of lymphosarcoma in an adult cow.

### 2. Case history and clinical observation

The 7-year-old crossbred Holstein–Friesian cow was presented in the large-animal clinic of Gadvasu Ludhiana. The animal had a history of progressive weight loss, decreased milk production, and chronic diarrhea for more than 2 months. A detailed physical and clinical examination was performed. There was no evidence of compromised vital parameters in the animal. Examination revealed that the consistency of feces was loose and watery, mixed with undigested feed particles (Table 1). In addition, rectal biopsy samples and tissue from mesenteric lymph nodes were taken for pathological examination. Furthermore, peritoneal fluid was collected and examined. After fixation of the tissue samples, the

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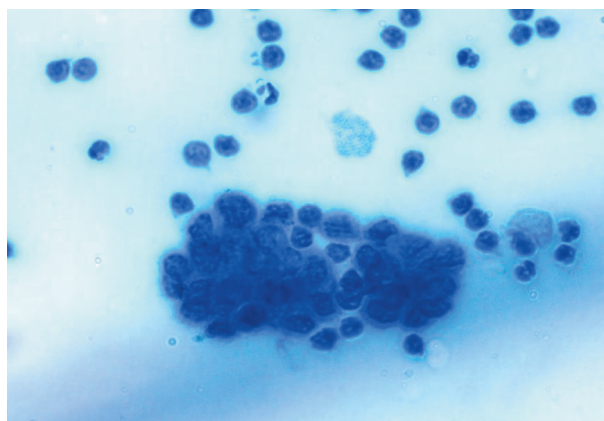
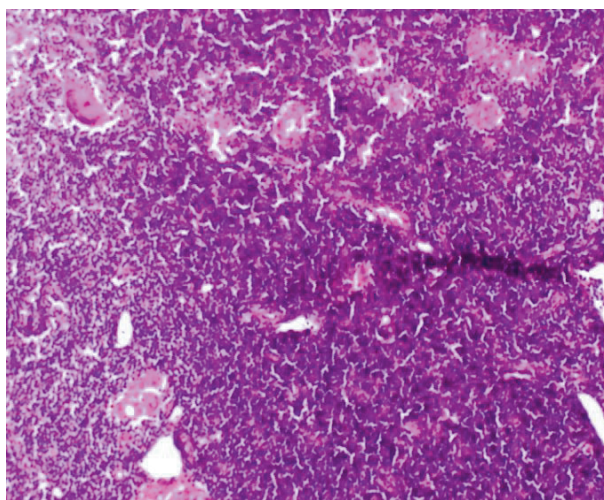
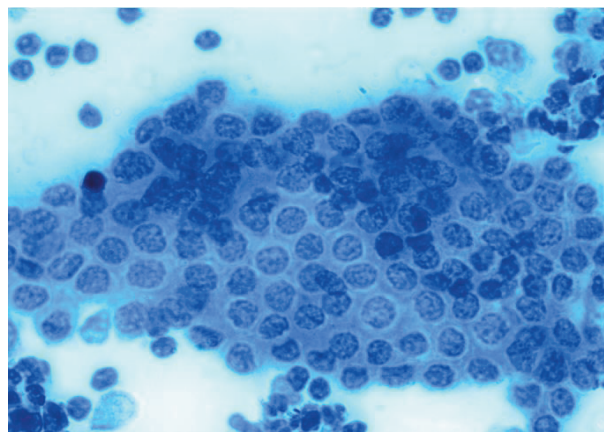
**Table 1.** History and physical examination in an adult cow with lymphosarcoma.

	History	Findings
1.	Course of diarrhea	2 months
2.	Feed intake	Reduced
3.	Body condition	Poor
4.	Milk yield	Decreased
5.	Consistency of feces	Loose
6.	Temperature	100.2 °F
7.	Heart rate	85 b/m
8.	Fecal microscopy	Negative
9.	Parasitic eggs	Negative

samples were subjected to paraffin embedding and stained with hematoxylin and eosin. A blood biochemical profile for liver function and fecal microscopy for parasites and acid-fast bacilli were performed; these were unremarkable.

### 3. Diagnosis and discussion

A fine needle aspirate of the peritoneal fluid-stained smear revealed reactive mesothelial hyperplasia and a few lymphoblasts. A histopathological examination of the mesenteric lymph nodes revealed lymphoid hyperplasia and mononuclear cells, which is confirmative for lymphosarcoma (Figures 1 and 2). These cells form numerous 3-dimensional clusters in mesothelial lymphosarcoma (Figure 3). A hematological examination revealing an increase in leukocyte count ( $8800 \times 10^3$ ) and marked decrease in hemoglobin level (6.5 g/dL) reflected the severe degree of anemia. Morphologically, red cells were normocytic and normochromic. Biochemical examination revealed hypoproteinemia (6.4 g/dL) and hypoalbuminemia (1.5 g/dL) in the affected animal (Table 2). The physical parameters of the animal were within normal range, and other diagnostic test results were negative. Thorough fecal examination was done to completely rule out any parasitic infection and any involvement of paratuberculosis bacilli, which was further confirmed by negative microscopic and PCR results. Serum was found to be negative for the antibodies to bovine leukosis virus. Later, postmortem and histopathological examinations confirmed visceral lymph node enlargement. A clinical diagnosis of bovine lymphosarcoma was made, with visceral lymph node enlargement resulting in consistent chronic diarrhea

**Figure 1.** Peritoneal smear showing proliferative hyperplasia of mesothelium (Leishman stain).**Figure 2.** Section of mesenteric lymph node showing lymphoid hyperplasia (hematoxylin and eosin; 450 $\times$ ).**Figure 3.** Mesothelial cell hyperplasia in biopsy sample.

**Table 2.** Hematobiochemical findings in an adult cow with lymphosarcoma.

	Hematology		Biochemistry	
1.	Hb (g/dL)	6.5	TP (g/dL)	6.4
2.	PCV (%)	19.71	Alb (g/dL)	1.5
3.	TLC ( $\times 10^3$ )	8800	Fibrinogen (g/dL)	0.2
4.	N (/ $\mu$ L)	5280	BUN (mg/L)	4.2
5.	L (/ $\mu$ L)	3344	Crea (mg/L)	0.9
6.	E (/ $\mu$ L)	176	P (mg/L)	6.5
7.			K (mEq)	7.4
9.			Cl (mEq)	89

in the adult cow. The chronic nature of the diarrhea, which was the consistent finding in this case, may have occurred due to intestinal lymphoid tissue involvement (6). Invasion of the lamina propria by neoplastic cells can cause malabsorption and diarrhea. Additionally, masses associated with the wall of the intestine can cause diarrhea by interfering with motility (7). Although anemia is not a consistent feature, leukocytosis and lymphocytosis can be seen occasionally in such cases (8). Lymphosarcoma is the most common multicentric neoplastic condition affecting cattle; however, there is a paucity of recent data on the clinical signs of bovine lymphosarcoma. Lymphosarcoma in bovines involves tumor formation in peripheral and visceral lymph nodes, the spleen, kidney, heart, uterus, and pituitary gland (9). However, chronic

diarrhea in this sporadic case of adult bovine was the main consistent clinical finding.

#### 4. Conclusion

Despite atypical consistent diarrhea, the clinical diagnosis of sporadic bovine lymphosarcoma was based on lymph node enlargement, the identification of reactive mesothelial hyperplasia and lymphoblasts in the peritoneal fluid, and absence of serological and fecal evidence of any parasitic or bacterial infection (10). It is confirmed that the knowledge of common clinical presentations and sensitivities of diagnostic tests will aid informed decisions on the most appropriate tests and interpretation of their results in a clinical case of bovine lymphosarcoma.

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