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**CASE REPORT**

# A Case of Lobulated Spleen in a Holstein Cow

Ayse HALIGUR * Ozlem OZMEN ** Mehmet HALIGUR **

* Department of Anatomy, Faculty of Veterinary Medicine, University of Mehmet Akif Ersoy, 15100, Burdur - TURKEY
** Department of Pathology, Faculty of Veterinary Medicine, University of Mehmet Akif Ersoy, 15100, Burdur - TURKEY

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## Summary

A case of abnormal lobulation of spleen in a three years old Holstein cow was described after slaughter. Post mortem evaluation of the cow revealed three lobes and two projections at the spleen. The color of the spleen was normal but lymphoid hyperplasia was observed at the cut surface. Hilus of the spleen was located on 1/3 of the facies visceralis. Histopathological examination of the spleen revealed that lymphoid hyperplasia. No abnormality was observed other visceral organs. This is a first case of lobulated spleen in a three years old Holstein cow.

**Keywords:** *Lobulated spleen, Anomaly, Cow*

# Bir Holstein İnekte Loblu Dalak Olgusu

## Özet

Holstein ırkı, üç yaşlı bir inekte kesim sonrası dalakta anormal loblaşma saptandı. Postmortem incelemede dalağın üç lob ve iki çıkıntısı bulunduğu dikkati çekti. Dalağın rengi normaldi ancak kesit yüzünde lenfoid hiperplazi saptandı. Dalağın hilus'u, facies visceralis'in 1/3'lük kısmına yerleşmişti. Histopatolojik incelemede lenfoid hiperplazi dikkati çekti. Diğer iç organlarda anomali saptanmadı Bu 3 yaşlı bir Holstein ineğinde karşılaşılan ilk loblu dalak olgusudur.

**Anahtar sözcükler:** *Loblu dalak, Anomali, İnek*

## INTRODUCTION

The spleen is located in the left hypogastric region. It lays the cranial surface of the reticulum on the left side of the abdomen and vertically on the cranial end of the dorsal sac of the rumen [1]. This organ is soft, bright red to dark purple in color and highly vascular. It contains lymphoid tissue. Spleen's size and weight vary throughout life and under different conditions. Generally, shape of spleen has an elongated, oval outline. In adult cattle, its average weight is about 665-1155 g [2-4] width is about 10-15 cm and length is nearby 50 cm or and in the middle thickness of organs is about 2 to 3 cm [2,4]. Parietal surface is convex and related to diaphragm. The visceral surface is concave and related chiefly to the left face of rumen. The dorsal part is attached to narrow adjacent and the ventral part is free. The hilus is situated on the dorsal third of the visceral surface, near the cranial border [2,3].

Pathology of the spleen can be categorized as congenital abnormalities, splenomegaly, focal abnormalities (cystic masses, solid masses), vascular abnormalities, trauma and rupture or splenic clefts, notches and lobulations, accessory spleen, wandering spleen and polysplenia [5,6]. Congenital anomalities of spleen usually together with cardiac and visceral anomalies and rarely polysplenia syndrome may be seen [7]. In one study in two spleens reported in a Holstein calf [8], other study in man indicated that polysplenia or asplenia may be seen.

The aim of this study was to report an unusual lobulation in a three years old Holstein cow. This is the first case of lobulated spleen in cattle.

İletişim (Correspondence)
☎ +90 248 2344500/1544
✉ ahaligur@hotmail.com

## CASE HISTORY

Material was occurred that it was butchered in which slaughterhouse of Burdur Power Confederation and it was not seen symptom of any illness. Spleen was fixed in 10% buffered formalin. It was examined and measured macroscopically for anatomo-pathological findings. Tissue sample of the spleen processed for histopathological examination. After routine pathology procedure it was blocked in paraffin, sections were cut 5 µ thickness and stained with Haematoxylin and Eosin (HE).

The cow was healthy, 3 years old, 752 kg body weight Holstein cow and no clinical symptoms observed related spleen abnormality. During the slaughter only one anomalous organ was spleen, the other organs were normal appearance and situs. Post mortem evaluation of the cow revealed that spleen was highly vascular and dark violet in color and weighted 412 g. Spleen length which between points was 26 cm and in the middle its thickness was width 5.1 cm. Splenic hilus was located in cranial part of organs and distribution of the vessels were normal one enter. It was very different form, both extremitas cranialis and caudalis had thin beginning, and had different two process and three lobes respectively in the spleen *(Fig. 1)*. The one splenic process was located in extremitas cranialis. It length was 0.844 cm and width 1.734 cm. The other process was located on margo cranialis. It length was 2.261 cm and width 4.345 cm. The first lob was located on the dorsal part of the margo caudalis. It arcuated caudally and length (margo caudalis to point of the process) was 8.5 cm and in the its middle width was 2 cm. The second lob was located on distal part of margo caudalis and its had finger like curled shape. It direction was caudal, ventral and cranial respectively. Length of first curl was measured 5.1 cm, second curl was 4.2 cm and width of this process was measured 3.4 cm. The third lob was look like continuing to organ and located to extremitas caudalis.

**Fig 1.** Macroscopic view of spleen
**Şekil 1.** Dalağın makroskobik görünüşü

End of the process was curving trough to cranial. Length of the first part of third lob was 8.5, and last part was 3.9 cm. Width of third process was measured as 3.2 cm. Hilus of the spleen was located on 1/3 of the facies visceralis.

Gross examination of the spleen revealed that marked lymphoid hyperplasia at the cut surface. The organ was not flat, and thickness of the spleen was more than normal. The body of the organ was smaller and harder than normal. No abnormality was observed in other organs. Histology of the spleen revealed that slight lymphoid hyperplasia *(Fig. 2, 3)*.

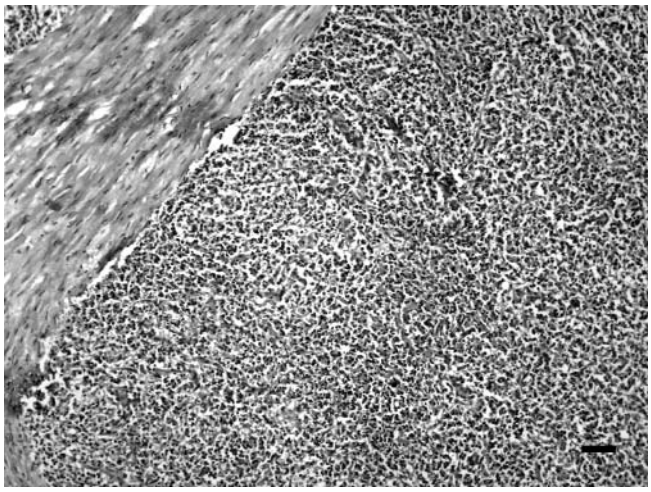

**Fig 2.** Microscopic observation of spleen, HE, Bar = 200 µm
**Şekil 2.** Dalağın mikroskobik görünüşü, HE, Bar = 200 µm.

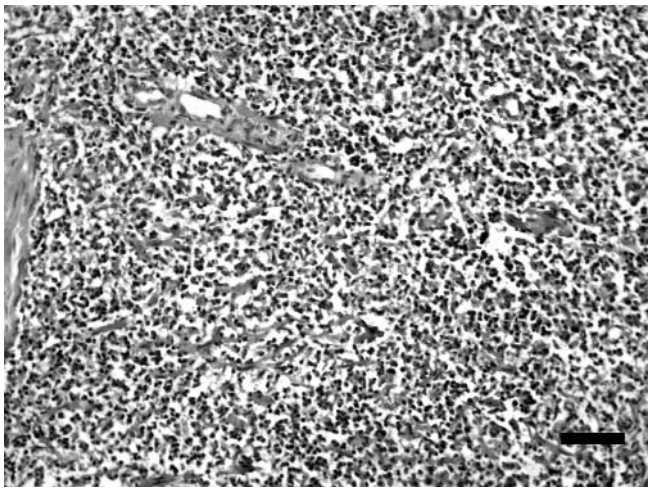

**Fig 3.** High power microscopic appearance of the spleen, HE, Bar = 100 µm.
**Şekil 3.** Dalağın büyük büyütmedeki görünüşü, HE, Bar = 100 µm

## DISCUSSION

The spleen lies vertically on the cranial end of the dorsal sac of the rumen and the cranial surface of the

reticulum on the left side of the abdomen [1]. In this case localization of the spleen was normal. Lobulated spleen is uncommon splanic abnormality. Generally spleen abnormalities are together with the other organ abnormalities or pathologic processes, even very complex and multiple abnormalities like as schistosomus refleksus spleen is generally normal [9,10]. But in this study, the other organs were normal shape and situs, only spleen lobulated. Generally, organ is soft, bright red to dark [2,3] while in this study was highly vascular and dark violet in color. According to literature [2], length of spleen is nearby 50 cm and width is about 15 cm and middle thickness of the organ is about 2 to 3 cm. In present case, we observed to length of between extremitas was 26 cm, and width of spleen was 5.1 cm. While the average weight is generally about 665-1155 g [2-4] we observed the organ's weight as 412 g. Localization of the hilus was similar to the previous knowledge [2,3].

During development, the spleen originates from splanic mesoderm (mesenchyme that surrounds the gut endoderm), which arises from splitting of the lateral plate mesoderm into somatic mesoderm (body wall) and splanic mesoderm [11]. In vertebrates, the mesodermally derived spleen normally displays left-handed asymmetry [12] and has been considered to be a landmark organ for detecting laterality defects [13]. In human, the fetal spleen is lobulated, but these lobules normally disappear before birth. Splenic lobulations may persist along the medial part of the spleen [5,14,15], but there is no information about animal splanic lobulation in embryonic development. The pathogenesis of this spleen anomaly is a result of abnormality of embryonic curvature [16]. In the present case, the cause could not be established because of the any clinical history.

In this study, histopathological finding was revealed to only lymphoid hyperplasia. Other organs prepared were very normal. Lymphocytes were prominent within the splenic parenchyma. Varies abnormalities have been determined in literature. These are generally congenital and the organs of it very changed (ventricular defect, atrial defect, atonia, hydrocephalus etc) [9]. But this is the first report of spleen anomaly seen in normal cow.

As a conclusion, this paper reported that unusual splenic lobulation in normally slauthered, 3 years old Holstein cow. Post mortem evaluation of the cow organs revealed three lobes and two projections at the spleen. No abnormality was observed other visceral organs.

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