

Comparative Morphometrical Studies on Spleen of Adult Sheep and Goat

Gunaji Yadav^{1*}, Sanjay Lambate², Ravindra Nimase³ and Chandrakant Kachave⁴

Department of Veterinary Anatomy and Histology, KNP College of Veterinary Science,
Shirwal, 412 801 (Maharashtra)

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ABSTRACT

The study was conducted on spleen of adult sheep and goat in Western Maharashtra region. Six spleen samples from each species were collected from local slaughter house. The spleen was the largest major secondary lymphoid organ, which involved in filtration of blood and preserves iron for hemoglobin synthesis. The spleen was single largest lymphoid ductless gland situated in the left hypochondriac region between diaphragm and dorsal sac of rumen. The shape of spleen in sheep was triangular while in goat it was quadrangular. The average weight of spleen was larger in sheep as compared that of goat. The maximum length, width, thickness and circumference of spleen was more in sheep than goat. The biometrical observations were significant at 5 % level.

Key words: Gross Anatomy, Morphometry, Spleen, Sheep, Goat

INTRODUCTION

In India, small ruminants like sheep and goat plays a very important role in the food and nutritional security of landless, marginal and small farmers in all agro climatic zones. Small ruminants are important source of meat, milk, wool and manure. It is well known that the lymphoid tissue plays an important role in the defense mechanism against the micro-organism (Suri *et al.*, 2017). Spleen involved in filtration of blood and preserves iron for hemoglobin synthesis (Samuelson, 2007). These important functions are carried out by the peculiar stroma and parenchyma components (Onkar and Govardhan, 2013). It is soft, highly vascular and bright red to dark purple in color. The spleen has a reticular framework suspended with in a collagenous framework consisting of a capsule thickened at hilus where it is attached to folds of peritoneum and where the arteries enter and the veins leave. Lymphocytes formed in the spleen

enter the blood stream. Lymphatic vessels are present only in the capsule and larger trabaculae. (Gardner *et al.*, 1969).

MATERIAL AND METHODS

The present study was conducted on spleen of healthy adult Deccani sheep and Usmanabado goat of either sex (sheep six samples and goat six samples) in the Department of Veterinary Anatomy and Histology, KNP College of Veterinary Science, Shirwal. The fresh tissue samples of spleen were collected from local slaughter house. Samples were brought the laboratory in ice box for the morphometrical observations. The tissue debris were removed and the observations were recorded based on the parameters such as weight, maximum length, maximum width, maximum thickness and circumference of the spleen of both the species. Weight was taken with the help of electric balance; length and width were measured by measuring scale at the widest portion of the organ. Thickness taken at thickest part of organ near hilus and

1*.Asst. Prof, 2. Prof., KNP College of Veterinary Science, Shirwal 3. Asst. Prof, MPKV,Rahuri, 4.Lab Technician

*Corresponding Author email: gunajiyadav@gmail.com

circumference was measured using a meter ruler (cm) and non-stretchable thread. The data generated were statistically analyzed by one way ANOVA (Snedecor and Cochran, 1994).

RESULT AND DISCUSSION

GROSS MORPHOLOGY

In the present study, the spleen of sheep and goat had two surfaces i.e. parietal Surface convex and concave visceral surface (Figure 1,2,3 and 4). The Visceral surface showed hilus at dorsal end at its cranial border (Figure 2). This finding was similar to the observations of Nickel *et al.*, (1979). The shape of sheep spleen was found triangular. The similar observations recorded by Bajpai, (1992) in local goat. The color of spleen was bluish red to dark purple and had relevance with findings of Bajpai, (1992) in local goat. While Suri *et al.*, (2017) mentioned that the color of goat spleen was reddish grey and reddish brown in sheep. Similar findings were recorded by Nickel *et al.*, (1979). In both the species, three borders were found i.e. basal, cranial and caudal and was similar to the finding of May (1955) and Pankaj kumar *et al.*, (2021) in sheep. The basal border was attached to the diaphragm along with 10th to 13th rib, cranial border was attached to 11th rib and caudal border was a line attached to 11th rib. The angles in both the species were three in number i.e. dorso-cranial, dorso-caudal and ventral (Figure 1,2,3 and 4). These findings were in agreement with May, (1955) and Pankaj kumar *et al.*, (2021) in sheep.

Gross Morphometry

Weight: The weight of spleen in sheep and goat was 152.5 ± 5.1 gm and 66.35 ± 3.19 gm, respectively. (Table: 1) Getty *et al.*, (1975) recorded

the weight of spleen 46 – 133 gm in indigenous sheep and Nickel *et al.*, (1979) noted 50.75 gm in indigenous sheep and was found to be lesser than the current study. Awal *et al.*, (1991) recorded the weight as 65-70 gm in goat respectively which was in concurrence with the present study.

Length: The average length of spleen in sheep and goat was 13.25 ± 0.13 cm and 11.58 ± 0.48 cm, (Table: 1) which were almost similar to the reports of Nickel *et al.*, (1979) in sheep which was 08.90 cm to 12.00 cm and also Suri *et al.*, (2017) recorded the length of spleen was 12.70 ± 0.81 cm and 11.48 ± 0.73 cm in sheep and goat, respectively. The variation in length may be due to breed and species variation.

Width: The average width of spleen in sheep and goat was recorded as 09.75 ± 0.20 cm and 09.05 ± 0.30 cm. (Table: 1) Suri *et al.*, (2017) recorded 09.26 ± 0.38 cm in sheep and 09.97 ± 0.79 cm in goat which was almost similar to our present observation.

Thickness: The average thickness of spleen in sheep and goat was as 03.51 ± 0.08 cm and 02.85 ± 0.11 cm (Table: 1) and Suri *et al.*, (2017) recorded that the thickness of spleen as 02.69 ± 0.20 cm and 02.37 ± 0.21 cm in sheep and goat respectively and was found to be less than the present observation which might be due to breed and species variation.

Circumference: The average Circumference of spleen in sheep and goat was recorded as, 35.20 ± 0.41 cm and 32.03 ± 0.70 cm respectively. (Table: 1). The biometrical observations were significant at 5 % level.

Table:1 Biometrical observations of spleen in sheep and goat

Sr. No.	Parameters	Mean $\pm$ SE Sheep	Mean $\pm$ SE Goat	T value at 5%
1.	Weight of spleen (gm)	152.5 $\pm$ 5.1	66.35 $\pm$ 3.19	2.22 and 3.16
2.	Maximum length of spleen (cm)	13.25 $\pm$ 0.13	11.58 $\pm$ 0.42	2.57 and 4.30
3.	Maximum width of spleen (cm)	9.57 $\pm$ 0.20	9.05 $\pm$ 0.30	2.22 and 3.16
4.	Maximum thickness of spleen (cm)	3.51 $\pm$ 0.08	2.85 $\pm$ 0.11	2.22 and 3.16
5.	Circumference of spleen (cm)	35.2 $\pm$ 0.41	32.03 $\pm$ 0.70	2.22 and 3.16

* The biometrical observations were significant at 5 % level.

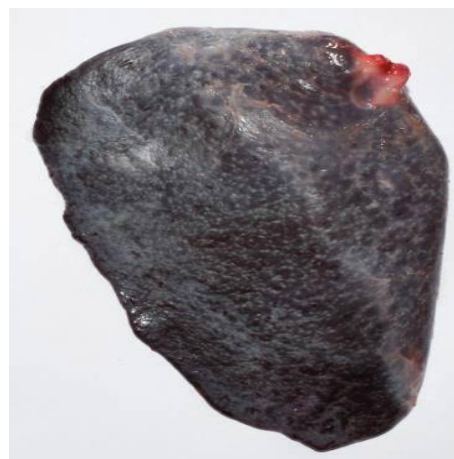

Fig.1 : Parietal surface of Sheep spleen

Fig.2 :Visceral surface of Sheep spleen

Fig.3 :Parietal surface of Goat spleen

Fig.4 :Visceral surface of Goat spleen

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