

Gross morphology of liver in Indian donkey (*Equus asinus*)

M DHOLAPPA¹, ASHOK PAWAR², R V PRASAD ³ and K T LAKSHMISHREE⁴

University of Agricultural Sciences, Dharwad, Karnataka, India

Received: 21 October 2004; Accepted: 9 September 2005

Key words: Donkey, Liver

Many structural works on the liver have been done in most of the domestic animals but a systematic, scientific study on the structure of liver on Indian donkey has not been done. Hence the present work has been undertaken.

The present study was conducted on the liver of 6 Indian donkeys, which were moribund in condition. The animals were embalmed in 10% formal saline. After 24 h the *in-situ* topographic anatomy of liver was studied by gross dissection and subsequently removed for recording gross morphological parameters (Table 1).

The liver of the Indian donkey was located on the abdominal surface of the diaphragm largely on the right side of the median plane, which is in agreement with the earlier reports of Nickel *et al.* (1976) in horse. It extended from 7th rib to 17th rib. The liver was purple to brownish red (Fig.1), while it was light or dark brown in horse (Nickel *et al.* 1976).

The liver of Indian donkey had 2 surfaces, 4 borders, 3 lobes and 6 ligaments. These findings were similar to the reports of Bone (1988) in horse. However, these differed with the reports of Khatra *et al.* (1993) in equines where the liver had five lobes.

Khatra *et al.* (1993) reported that the maximum length, width and thickness of the liver in equines were 33.0 cm, 19.8 cm and 7.4 cm respectively. Frandson (1992) stated that

the average weight of the liver in horse and cow was 5 kg and accounted for 0.8 to 1.5% of the body weight, whereas in the present study the maximum length was 36.40 ± 7.02 cm, width 17.24 ± 2.13 cm, and thickness 7.63 ± 0.92 cm. The average weight was 1.23 ± 0.17 kg which accounted for 2.12% of the body weight which indicates that the liver of donkey is little larger and it may be one of the factors responsible for this animal to be more hardy, and its ability to thrive well

Table 1. Different morphometrical parameters of liver in Indian donkey (*Equus asinus*)

Gross Parameters	Mean Values
Organ weight (kg)	1.23 ± 0.17
Percentage of body weight	2.12 ± 0.05
Maximum length (cm)	36.4 ± 7.02
Maximum width (cm)	17.24 ± 2.13
Maximum thickness (cm)	7.63 ± 0.92
Maximum depth of umbilical fissure (cm)	3.98 ± 0.75

Present address: ¹Professor and Head, ²Teaching Associate, ³Post-Graduate Scholar, Veterinary College, Hebbal, Bangalore 560 024.

⁴Assistant Professor, Department of Anatomy, Veterinary College, Bidar 585 401.

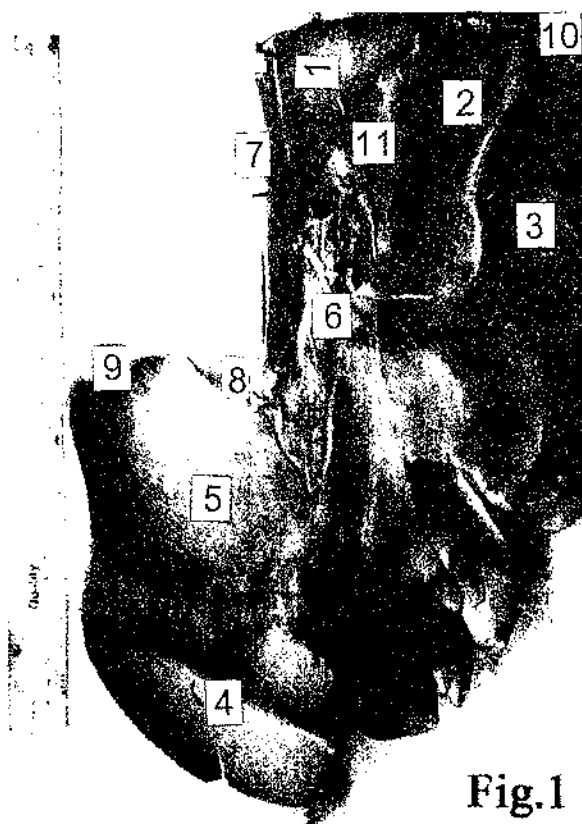


Fig.1

Fig. 1. Gross photograph of the liver of Indian donkey showing its visceral surface. 1. Renal impression, 2. Duodenal impression, 3. Cecal impression, 4. Right dorsal colon, 5. Gastric impression, 6. Portal fissure, 7. Median sulcus, 8. Esophageal notch, 9. Left lateral ligament, 10. Right lateral ligament, 11. Caudate process.

on low quality feed and fodder (Table 1).

The visceral surface of Indian donkey was irregularly concave and consisted of portal fissure, gastric, right dorsal colon, renal, duodenal and caecal impressions (Fig. 1), which is in agreement with the reports of Dyce *et al.* (1996) in horse.

The right lobe was the largest and had caudate process at the upper part of the visceral surface but no papillary process in the present study, which was in agreement with the records described by Dyce *et al.* (1996).

The absence of gall bladder in equine and rhinoceros had been reported by Sisson and Grossman (1953) and Chakraborty *et al.* (1989) respectively.

The present study also revealed that there was no gall bladder in the Indian donkey. The common hepatic duct opened into the duodenum at the hepato-pancreatic ampulla, which was about 9–10 cm away from the pylorus along the side of the pancreatic duct. It resembles the earlier reports of Frandson (1992) in the horse.

SUMMARY

Gross morphology of the Indian donkey was studied. The

liver of the Indian donkey was located on the abdominal surface of the diaphragm on the right side of the Indian plain. Length, width and thickness of the liver were noted. Gall bladder was not observed in the study.

REFERENCES

- Bone J F. 1988. *Animal Anatomy and Physiology*. 3rd edn, pp: 166–71. A Reston Book Prentice Hall, New Jersey.
- Chakraborty A., Bhattacharya M and Baishy G. 1989. A note on the liver of Indian one-horned rhinoceros (*Rhinoceros unicornis*). *Indian Veterinary Journal* **66**: 1071–72.
- Dyce K M, Sack O and Wensing C J. 1996. *Textbook of Veterinary Anatomy*. 2nd edn, pp. 543–46. W.B. Saunders Co., Philadelphia.
- Frandson R D. 1992. *Anatomy and Physiology of Farm Animals*. 5th edn, pp 526–28. Lea & Febiger, Philadelphia.
- Khatri G S, Jaswant Singh and Pawar H S. 1992. Morphometry and some variations in the equine liver. *Indian Journal of Veterinary Anatomy* **5**(5): 1–5.
- Nickel R, Schummer A and Seiferle E. 1976. *The Viscera of the Domestic Mammals*. pp 194–99. Verlag Paul Parey, Berlin.
- Sisson S B and Grossman J D. 1953. *The Anatomy of the Domestic Animals*. 3rd edn, pp. 435–41. W.B. Saunders Co., Philadelphia.