Haryana Vet. (December, 2020) **59(2)**, 270-271

Clinical Article

CLINICO-PATHOLOGICAL CHANGES ASSOCIATED WITH MALIGNANT PERITONEAL MESOTHELIOMA IN A FEMALE LABRADOR RETRIEVER DOG

BIPLAB DEBROY[1], MRITUNJAY KUMAR*, J. ROY, S.W. MONSANG[2] and V. LALZAWMLIANA[2]
Department of Veterinary Clinical Complex, [1]Department of Veterinary Pathology
[2]Department Veterinary Surgery and Radiology
College of Veterinary Sciences & Animal Husbandry, R.K. Nagar-799008, Tripura, India

Received: 19.02.2020; Accepted: 23.04.2020

SUMMARY

The present case study reports clinico-pathological changes associated with malignant peritoneal mesothelioma in a 10 years old female Labrador Retriever dog.

Keywords: Dog, Malignant, Peritoneal mesothelioma

Mesothelioma is a rare aggressive tumour arising from the lining cells of the peritoneum (Head *et al.*, 2002). The mesothelioma is more common in male than female dogs and is associated with long-term exposure to asbestos and pesticides (Glickmann *et al.*, 1983; Ogilvie and Moore, 2006; Ledecka *et al.*, 2010). The intra-peritoneal mesothelioma causes typical clinical signs such as ascites, weight loss and presence of palpable abdominal masses, which can be identified through physical examination of the animal (Merlo *et al.*, 2007). The treatment options for malignant peritoneal mesothelioma are very limited and ineffective. Considering the paucity of reports on peritoneal mesothelioma in dogs, the present article describes about the clinico-pathological changes in a female Labrador Retriever dog suffering from malignant peritoneal mesothelioma.

A 10 years old female Labrador Retriever dog was presented to Teaching Veterinary Clinical Complex, College of Veterinary Sciences & Animal Husbandry, R. K. Nagar, West Tripura, Tripura with complaints of anorexia, vomiting, lethargy, abdominal distension from last 7 months with history of symptomatic treatment for ascites. Detailed clinical examination of the case revealed normal temperature (101.4 ^{0}F), fluid thrill on abdominal percussion and pale conjunctival mucous membrane. Ultrasonography examination revealed the presence of anechoic fluid in the abdominal cavity and hyperechoic texture of liver tissue parenchyma. X-ray examination showed abdominal distension with no distinctive abdominal contents (Fig. 1).

Blood sample was collected from the cephalous vein for haemato-biochemical studies. The biochemical parameters viz., blood urea nitrogen [BUN], serum creatinine, Alanine transaminase [ALT] and Aspartate aminotransferase [AST] were estimated using standard kits. Abdomino-centesis, 3-4 cm caudal to the umbilicus (Mondal *et al.* 2012) followed by cytological examination of peritoneal fluid was done using Giemsa stain. The dog died inspite of intensive therapy on day 18 of treatment. Thorough necropsy examination of the dog was performed and representative tissue samples were collected and fixed in 10 % buffered formalin and paraffin embedded tissue sections (5 µm) were prepared for staining with haematoxylin and eosin (HE) (Luna, 1968).

The haematological values showed normal total leukocytes count 6200/cmm with neutrophilia (4960/ cmm) and leucopenia (1054/cmm). The values of haemoglobin (8.16 gm/dl), PCV (28%), MCV (68.6 fl), MCH (10.6 pg), MCHC (28.5 gm %) were found to be lower than the reference values in dogs with normocytic hypochromic anaemia. The biochemical changes showed normal values of BUN (22.4 mg/dl), serum creatinine (1.1 mg/dl) and elevated level of ALT (97.00 U/L) and AST (114.00 U/L). Abdomino-centesis revealed serosanguineous fluid which is common finding in dogs suffering from peritoneal mesothelioma (Ulgen *et al.*, 2015).

Cytological examination of the peritoneal fluid revealed anisokaryosis, anisocytosis, increased nuclear/ cytoplasm ratio and occasional mitotic figures (Fig. 2). Necropsy examination revealed presence of very small multiple irregular nodular mass arising from the peritoneal lining covering liver, spleen and intestine (Serakides *et al.*, 2001).

Histopathologically, irregular thickening of serosal surface of liver, spleen, stomach and intestine containing polygonal to epithelioid neoplastic mesothelial cell showing anisokaryosis, anisocytosis and occasional mitotic figure was noticed (Fig. 3). Depending upon all the above, the present case was diagnosed as malignant peritoneal mesothelioma.

Mesothelioma is common in dogs aged four to thirteen years old but juvenile mesothelioma and epitheloid

*Corresponding author: mritunjay_medicine@rediffmail.com

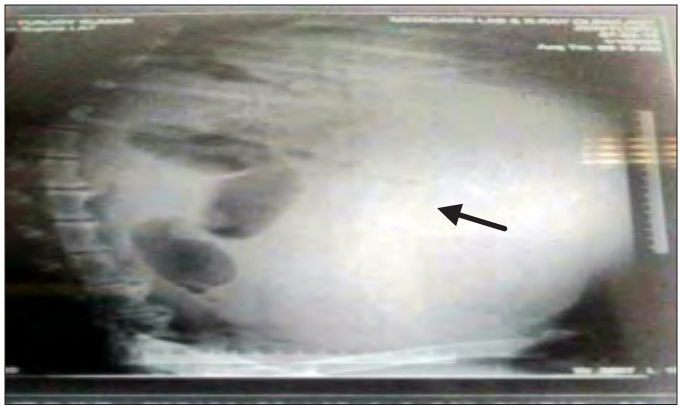

Fig. 1. Lateral view (X-ray) showing abdominal fluid as diffusely increased density

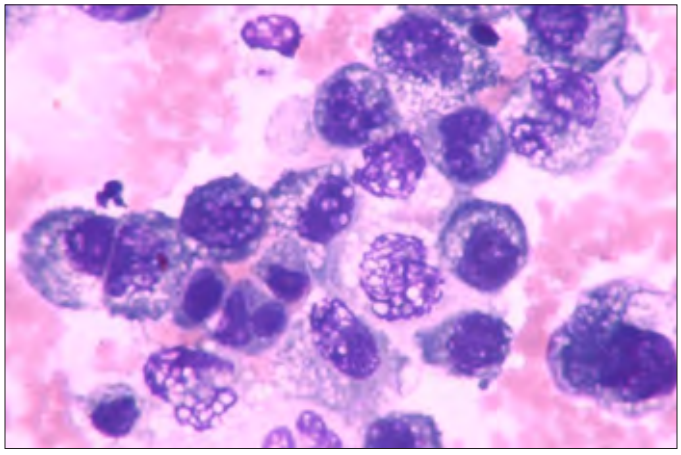

Fig. 2. Neoplastic mesothelial cells showing anisokaryosis, anisocytosis, increased nuclear/cytoplasm ratio and intra-cytoplasmic ratio and intra-nuclear vacuoles. Giemsa stains 400X.

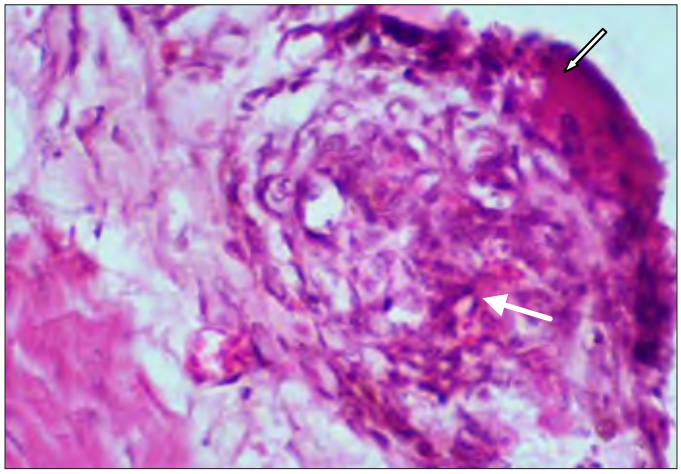

Fig. 3. Nodular growth (white arrow) containing neoplastic mesothelial cells with occasional mitotic figure (black arrow) on the serosal surface of the intestine. HE 100X.

mesothelioma have also been described previously in a nine-month puppy (Head *et al.*, 2002; Vural *et al.*, 2007). The primary sites of tumour development in dogs as well as in humans have been reported to be the pleura, followed by the pericardium and the peritoneum (Garrett, 2007).The overall median survival was only 1 year although a few cases of long-term survivors have also been reported in human (Tander *et al.*, 2001). The clinical signs of dyspnoea and abdominal distension are usually accompanied by accumulation of serous fluid in the cavity as noticed in our study or a large to moderately sized mass filling the pleural space (Alleman *et al.*, 2003). However, no distant metastasis was observed in the present case. The biochemical changes in this report were similar to findings of Ulgen *et al.* (2015) except for ALT and AST.

In conclusion, serosanguinous peritoneal fluid, anisokaryosis, anisocytosis, increased nuclear/cytoplasm ratio and occasional mitotic figures on cytology, presence of multiple irregular nodular mass arising from the peritoneal lining covering liver, spleen, stomach and intestine on post-mortem and irregular thickening of serosal surface of liver, spleen, stomach and intestine containing polygonal to epithelioid neoplastic cells are suggestive of the presence of the mesothelioma.

REFERENCES

Alleman, A.R. (2003). Abdominal, thoracic, and pericardial effusions. *Vet. Clin. North Am. Small. Anim. Pract.* **33**: 89-118.

Garrett, L.D. (2007). Mesothelioma. In: Small Animal Clinical Oncology. (4th Edn.), Withrow, S.J. and Vail, D.M. (Edts.), Saunders Elsevier, Philadelphea. pp. 847.

Glickmann, L.T., Domanski, L.M., Magure, T.G., Dubielzig, R.R. and Churg, A. (1983). Mesothelioma in pet dogs associated with exposure of the owners to asbestos. *Environ. Res.* **32**: 305–313.

Head, K.W., Else, R.W. and Dubielzig, R.R. (2002). Tumours of the alimentary tract. In: Meuten, D.J. (Edt.): Tumours in Domestic Animals. (4th Edn.) Iowa State Press, Iowa. pp. 401–481.

Ledecka, K., Sevcikova, Z., Mihaly, M., Hajurka, J., Pavuk, V., Hluchy, M., Skurkova, L., Lackova, M. and Ledecky, V. (2010). Mesothelioma of the pericardium in a Bernese mesothelioma of the pericardium in a Bernese Mountain dog. *Veterinarski Arhiv*. **80**: 797–806.

Luna, L. G. (1968). Manual of histologic staining methods of the armed forces institute of pathology. (3rd Edn.), McGraw-Hill, New York, pp. 111-112.

Merlo, W.A., Rosciani, A.S., Koscinczuk, P., Ortega, H.H., Insfrán, R.M. and Macció, O.A. (2007). "Mesotelioma peritoneal en un canino". *Revista Veterinaria.* **18**: 55-57.

Mondal, D.B., Kumar, M., Saravanan, M. and Sarma, K. (2012). peritoneal fluid analysis in canine disease diagnosis. *J. Adv. Vet. Anim. Res.* **2**: 307-313.

Ogilvie. G.K. and Moore, A.S. (2006). Managing the Canine Cancer Patient: A Practical Guide to Compassionate Care. Veterinary Learning Systems Book. Trenton, NJ.

Serakides, R., Cassali, G.D., Santana, F.J.F. and Nasimento, E.F. (2001). Peritoneal mesothelioma in dog- a case report. *Arq. Bras. Med. Vet. Zootec.* **53(2)**:1-5.

Tandar, A., Abraham, G., Gurka, J., Wendel, M. and Stolbach, L. (2001). Recurrent peritoneal mesothelioma with long-delayed recurrence. *J. Clin. Gastroenterol.* **33**: 247-250.

Ulgen, S., Bakirel, U.,Yildiz, K.,Yildirim, F. and Firat, I. (2015).Pleural effusion in a dog with mesothelioma. *J. Life Sci.* **9**: 362-365.

Vural, S.A., Ozyildiz, Z. Ozsoy, S.Y. (2007). Pleural mesothelioma in a nine month-old dog. *Irish Vet. J.* **1**: 30-33.