

**SPONTANEOUS NEOPLASMS IN SHEEP WITH REPORT OF CASES  
OF MELANOMA' MESOTHELIOMA AND LYMPHOSARCOMA**

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**SUMMARY**

Melanoma, mesothelioma and lymphosarcoma as masses of neoplastic tissue were diagnosed in ovine specimens received for necropsy during 1975-1980 at the Pathology Department of Razi Institute in Iran. In the case of melanoma, the tumors were present as irregular spheroid nodules in liver, heart and lungs. Mesothelioma tumors appeared as multiple discrete nodules on the parietal and visceral peritoneum. Lymphosarcomas were present as masses of 1-15 cm. in diameter in the mediastinal mesentric and hepatic lymph nodes. The macroscopic and microscopic findings are discussed.

**INTRODUCTION**

Melanoma is a malignant tumor arising from melanocytes that produce melanin pigment. It usually occurs in the skin and metastasizes to the internal organs. It is reported in horses (Cotchin, 1960; Furrow, Shalkop, & Sturkie, 1977), in cattle (Balani & Lyer, 1971; Singh, Parisher & Prasad, 1975) in sheep (Steiner & Bengstom, 1951) and goats (Vankatesan, Nandy, Santappa, 1979).

Mesothelioma is a rare neoplasm of mesodermal origin which occurs in pleural, peritoneal and pericardial surfaces. It has been found in cattle and sheep (Monlux, Anderson & Danis, 1956; Baskerville, 1967; Smith, Jcnes & Hunt, 1972; Damodaran & Parthasarathy, 1972).

Lymphosarcoma is characterised by a diffuse infiltration of organs with neoplastic lymphoid cells. It is reported in horse (Neufeld, 1973), bovine (Carson & Jones, 1968; Miller & Olson, 1971) and sheep (Monlux, Anderson & Danis, 1956; Olson & Baumgartener, 1976).

## MATERIALS AND METHODS

### 1 – Materials

#### Tissue for melanoma case:

Liver and heart of a 2 year old ewe, slaughtered at Qazvin abattoir, were sent to the Department of Pathology of Razi Institute for histo-diagnosis in June 1978. Unfortunately the skin specimen was not included.

#### Tissue for mesothelioma case:

A 2½ year old ewe was submitted to the Clinic of Pathology Department of the Razi Institute in March 1975. It showed anorexia, recumbency and dyspnea. The rectal temperature was 36°C. The sheep was sacrificed and postmortem examinations were carried out. Specimens from internal organs were taken for histo-diagnosis.

#### Tissue for lymphosarcoma case:

The internal organs of a slaughtered sheep from the suburbs of Karaj, close to the Razi Institute, were delivered to the Pathology Department for histo-diagnosis in March 1980.

### 2 – Methods

Specimens for histopathology investigations were taken in 10% formalin solution and kept for 48 hours for fixation. After processing the tissues were embedded in paraffin and 6µ sections were cut on a rotary microtome. These were stained with Hematoxylin and Eosin (H & E), Fontana-Masson Silver (F.M.S), Van Gieson (VG).

## RESULTS

### Gross pathology

#### 1 – Melanoma case:

The tumors were present in the liver, heart and lung tissues. The tumor masses were irregularly spheroid in shape, measuring 2-50 mm. in diameter, deep dark in color soft in consistency and bulging on the surface of the organs (Fig.1). In liver, the tumor growth was disseminated while in heart and lung was focal. In heart it was confined to the auricles whereas in lungs the neoplastic tissues were present in the mediastinal lymph node.

## 2 – Mesothelioma case:

The abdominal cavity contained approximately 500 mls. blood-tinged fluid. The omentum on both surfaces was covered with white-yellowish pearly nodules with diameter ranging from a few millimeters up to 2 cm. These nodules were also present on abdominal surface of diaphragm. In some areas they coalesced, producing a big cauliflower-like mass which partly occupied the abdominal cavity (Fig. 2). There was no adherence of these nodules to the parietal walls of abdominal cavity. These nodules were also present on the peritoneum, surrounding capsules of liver and kidneys, large ligament of uterus and supporting ligament of the urinary bladder. Some of these nodules showed ulceration and were tinged with blood. No lymph node was affected. Thoracic cavity and pleura were intact.

## 3 – Lymphosarcoma case:

Mediastinal, mesenteric and hepatic lymph nodes were enlarged and showed hemorrhagic areas on the surface. On the cut surface they were lobulated, soft in consistency and white-yellowish in color. The tumor masses varied from 1–15 cm. in size. The normal cellular architecture of lymph nodes was replaced by a soft white-yellowish tissue tinged with hemorrhages (Fig. 3).

## **Histopathology**

### 1 – *Melanoma case:*

Liver—The portal cells near the tumor masses were found to be atrophic and degenerated. In some areas, fatty degeneration noted. The sinusoids were dilated and scattered hemorrhages were present. The tumor masses consisted of spheroidal or oval cells. The nuclei of neoplastic cells were round, more basophilic than those of the liver cells and contained conspicuous chromatin granules. The melanocytes were sparsely scattered, containing various amounts of melanin pigment. In some places they were overshadowed by deposits of free melanin granules (Fig. 4). Sections stained with F.M.S. confirmed the presence of melanin pigments. The cells in hepatic lymph node were completely replaced by neoplastic cells.

Metastases were observed in heart and in the mediastinal lymph node with characteristics identical to those described for the neoplastic masses in liver.

### 2 – *Mesothelioma case:*

At low magnifications, the tumor cells showed papillary or polypoid pattern. The delicate connective tissue stalks were covered by mesothelial cells varying in size and shape (Fig. 5). Sections stained with V.G. method revealed that

the connective tissue elements were mainly composed of collagen. Mitotic figures were quite rare. Few lymphocytes were seen in some areas. Scattered patches of pyknotic and hyalinized cells were noted. There was no evidence of metastasis either to the subserosa or to the mucosal layers.

### 3 - *Lymphosarcoma case* :

**Lymph nodes** - In certain fields , the normal follicular structure was disrupted and filled with immature lymphocytes , connective tissues and cell debris. Scattered hemorrhages were noted throughout. The cytoplasm of the neoplastic cells showed irregular tags. Mitotic figures were observed at high magnification (Fig. 6).

**Lung** - Inter - alveoli walls were thickened . Mononuclear cells , mostly lymphoblasts infiltrated throughout. The lymph nodules within the lung parenchym were mostly composed of lymphoblasts .

## DISCUSSION

The rare neoplastic cases of sheep are diagnosed and reported here in. These are melanoma, mesothelioma and lymphosarcoma which are fairly frequent in other species of animals. Since epidemiological aspects of the neoplastic diseases of animals bear some importance to the human and animal health and play a valuable role in the field of oncology, the report of rare cases is considered necessary in order to provide enough materials for further studies. To the best knowledge of the authors, this is the first report on the occurrence of these tumors in sheep in Iran.

Due to the paucity of the specimens examined complete distribution of melanoma in organs , particularly lymph nodes was impossible. Furthermore , since the authors had only received the internal organs , the site of primary tumor remained obscure . Our macroscopic and microscopic findings agreed with those reported by Baxter ( 1960 ) and Mangkoewidjojo & Kim ( 1977 ) who examined the tumor in sheep and laboratory animals.

Mesothelioma is one of the rare neoplasms in most of animal species which its metastasis is rarely considered malignant and invasive ( Baskerville, 1967; Jubb & Kennedy, 1972). Unfortunately, due to unavailability of the pedigree line and detailed case history the origin of the tumor remained in dispute.

Lymphosarcoma in other animals is classified into four forms, i.e. multicentric, thymic, alimentary and unclassified ( Jarrett et al, 1966 cited from Crighton, 1968). It was not possible to categorized the present case according to the aforementioned classification with certainty, since only the internal organs were submitted for examination and complete case history was lacking. More-

over, the location of the primary tumor was not discovered. However, on the account of the lack of germinal centres, the presence of degenerating tumor cells, the decreased size of lymph nodes and the thickening of lymph nodes capsules. The case was taken to be "Regression of Thymic form". Similar observations have been reported by others (Miller & Olson, 1971).

### **Acknowledgements**

The authors wish to express their thanks to Dr. B. Zakarian, pathologist of veterinary faculty, Teheran University for reading and suggestion on the manuscript. The technical assistance of A. Sharbati and T.Keshavarz also appreciated.

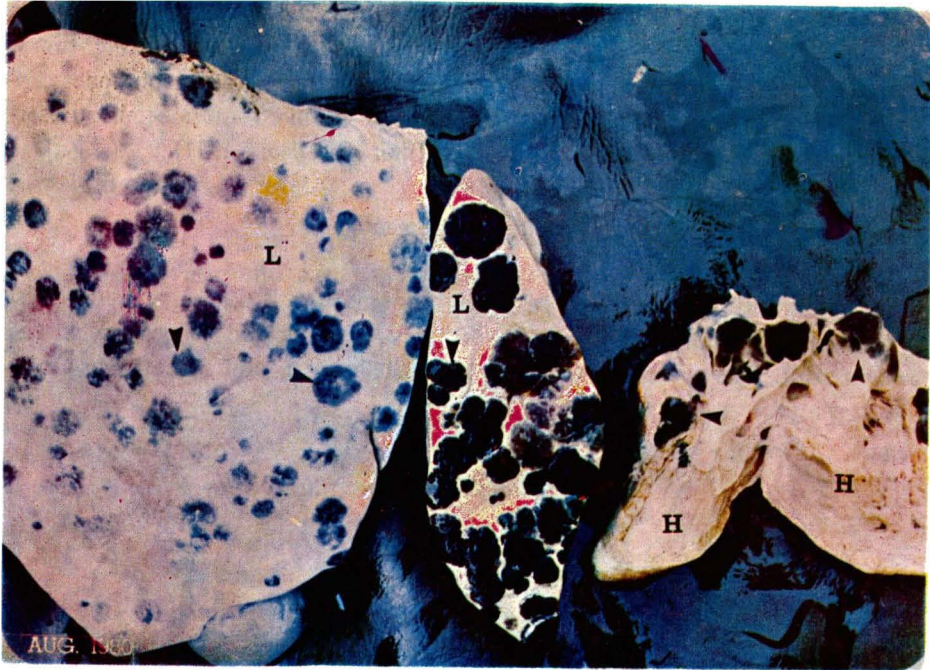


Fig. 1: Disseminated neoplastic growths of melanoma in liver and heart (arrows).



Fig. 2: Nodules of mesothelioma on the surface of omentum (arrows). Cauliflower like growth of the tumor is shown in the upper left (double arrows).



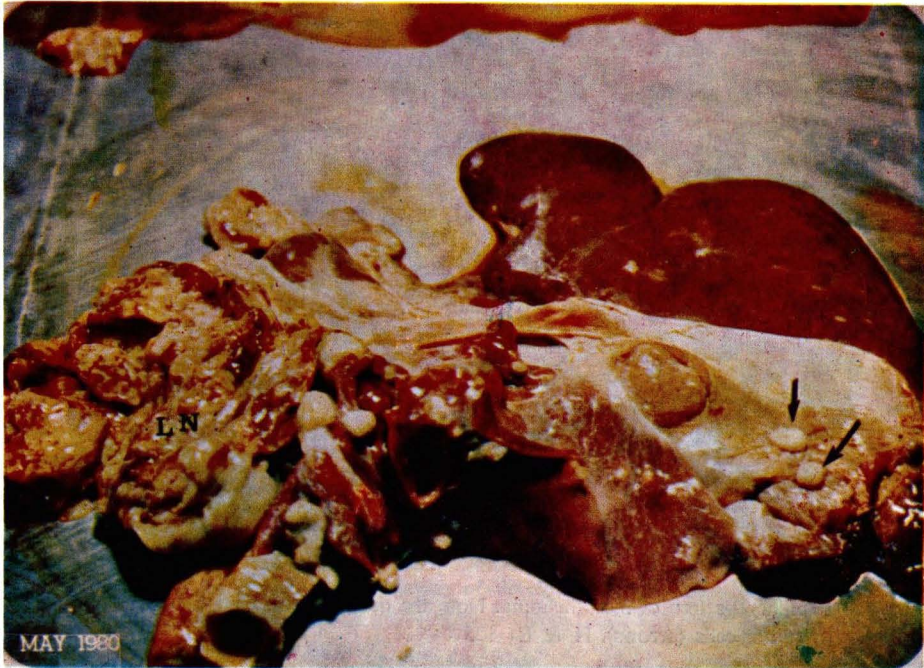


Fig. 3: Lymphosarcoma of the mediastinal lymph node (LN) and the disseminated metastatic foci on the diaphragm (arrows).

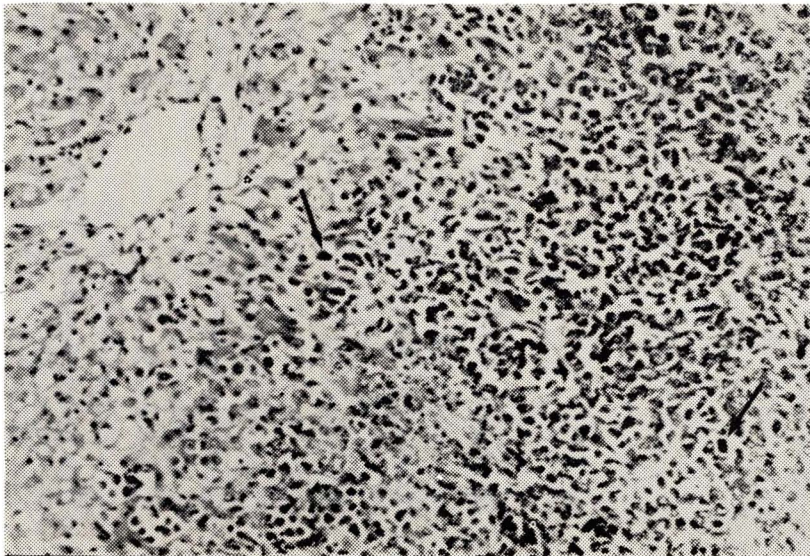


Fig. 4: Melanocytes containing melanine pigment (arrows) are lodged between the liver cells.  
H & E=125×



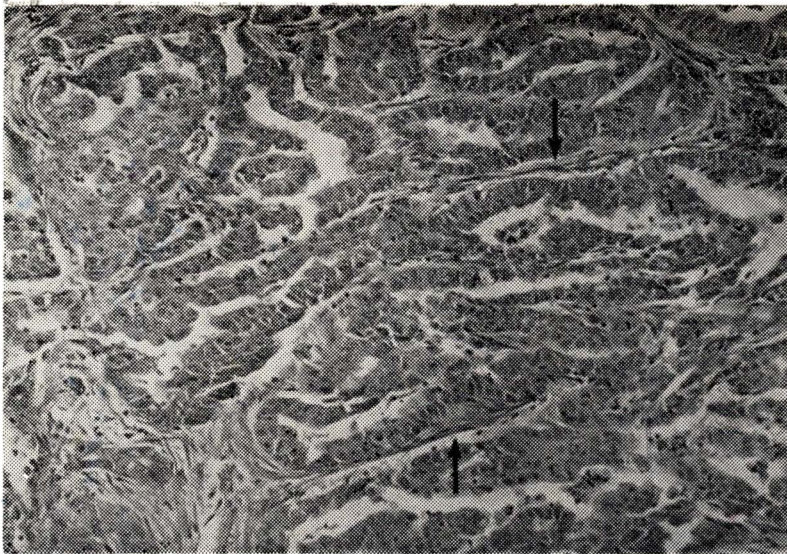


Fig. 5: Papillary pattern of mesothelioma. Note the delicate connective tissue stalks covered by tumor cells (arrows). H & E=125 $\times$

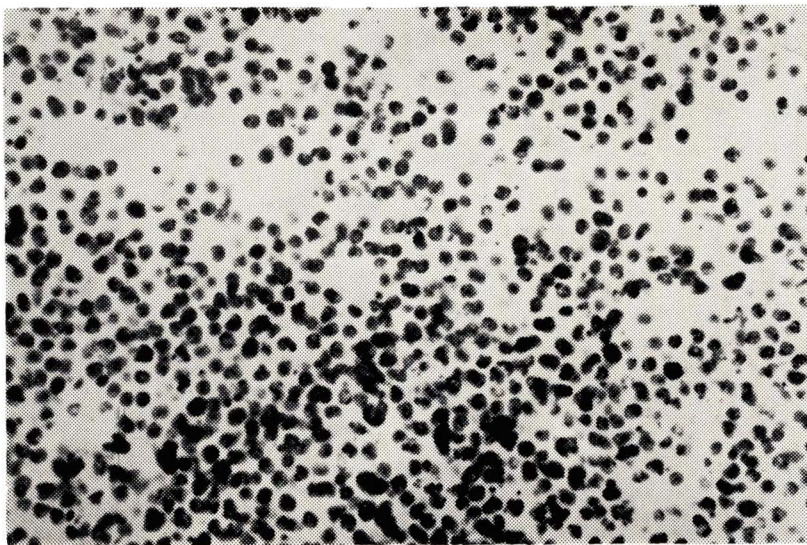


Fig. 6: Lymphosarcoma of mediastinal lymph node. Note the pleomorphism and hyperchromasia of the cells. H & E=125 $\times$



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