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Pleural Mesothelioma in a Sheep

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Abstract: The lung from a 4 years old sheep with history of respiratory distress due to presence of cauliflower-like masses on its surface was referred to Department of Pathobiology, Faculty of Veterinary Medicine, University of Shahrekord. After gross examination, for histopathological examination of these masses, tissue samples were taken, processed in routine way and stained with hematoxylin and eosin. Microscopically, proliferation of visceral pleural mesothelial cells produced papillary projections on the lung surface. Numerous and different sized clusters of pleomorphic neoplastic cells with hyperchromatic nuclei were seen beneath the papillary projections that had cystic or acinar appearance in some regions. In addition to proliferation of neoplastic mesothelial cells, proliferation of mesenchymal component was observed in different sections. In some regions, the formation of dense collagenous connective tissue was seen too. According to macroscopic and microscopic features, the masses on the lung were diagnosed as mesothelioma.

Key words: Mesothelioma, pathology, sheep

INTRODUCTION

Mesotheliomas are tumors that develop from the mesothelial lining of the body cavities. Pleural mesothelioma may occur as an isolated neoplasm or in combination with pericardial or peritoneal mesothelioma (Wilson and Dungwoth, 2002). Mesothelioma is rare in human beings and most domestic animals but is seen most commonly in calves, in which it can be congenital (Lopez, 2001). There are many reports of naturally occurring mesothelioma in dogs (Dias Pereira *et al.*, 2001; Geninet *et al.*, 2003; Harbison and Godleski, 1983; Kim *et al.*, 2002).

The occurrence of mesothelioma in sheep is rare and only a case of malignant mesothelioma has been reported in a lamb (Brown and Weaver, 1981). There is no more report about pathological characteristics of this tumor in sheep in the literature. In this report, we describe macroscopic and different microscopic features of visceral pleural mesothelioma in a naturally affected sheep.

MATERIALS AND METHODS

The lung from a 4 years old sheep with history of respiratory distress due to presence of masses on its surface was referred to Department of Pathobiology, Faculty of Veterinary Medicine, University of Shahrekord, Iran in 2004. After gross examination of these masses, tissue samples were taken and fixed in 10% neutral buffered formalin. They were processed by routine

method and embedded in paraffin. Sections of 5 μ m thickness were cut, stained with hematoxylin-eosin and studied microscopically.

RESULTS AND DISCUSSION

Macroscopic examination of the affected lung revealed multiple, different sized and cauliflower-like masses on the visceral pleural surface of lung.

Microscopically, proliferation of visceral pleural mesothelial cells produced multiple cell layers and papillary projections on the lung surface (Fig. 1). There were very long invaginations of mesothelial growths too. Numerous and different sized clusters of pleomorphic neoplastic cells with hyperchromatic nuclei and distinct nuclear membrane (Fig. 2 and 3) were seen beneath the papillary projections that had cystic or acinar appearance in some regions (Fig. 4). The cytoplasm was eosinophilic or lightly basophilic and occasionally contained small vacuoles. Mitotic figures were rare. In addition to proliferation of neoplastic mesothelial cells, proliferation of mesenchymal component was observed in different sections (Fig. 5). In some regions, the formation of dense collagenous connective tissue or desmoplastic reaction was seen too (Fig. 4). The stroma of tumor contained many inflammatory cells especially plasma cells in some sections. According to macroscopic and microscopic features, the masses on the lung were diagnosed as mesothelioma.

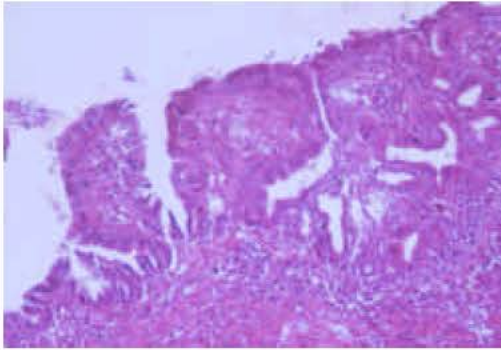


Fig. 1: Papillary projections due to proliferation of visceral pleural mesothelial cells on the lung surface (H and E, $\times 185$)

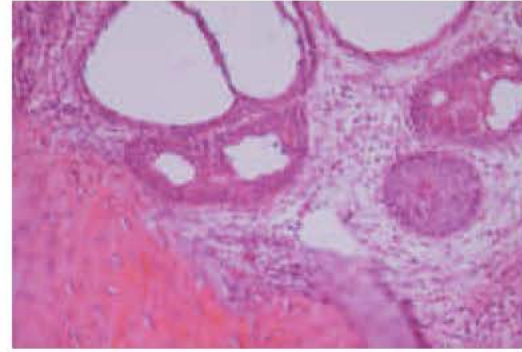


Fig. 4: Formation of dense collagenous connective tissue and cystic appearance are seen in this field (H and E, $\times 185$)

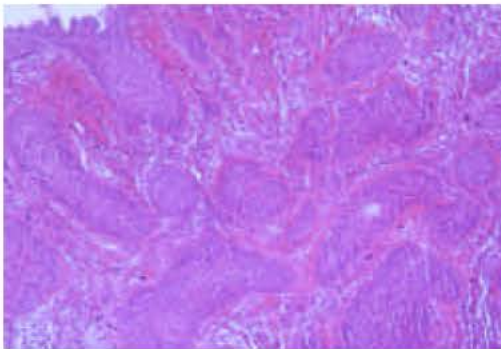


Fig. 2: Numerous clusters of neoplastic cells are seen beneath the papillary projections (H and E, $\times 185$)

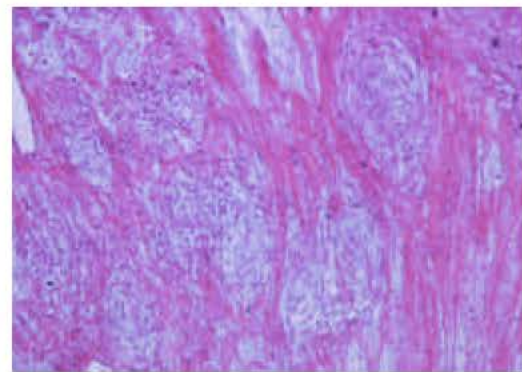


Fig. 5: Proliferation of mesenchymal component (H and E, $\times 185$)

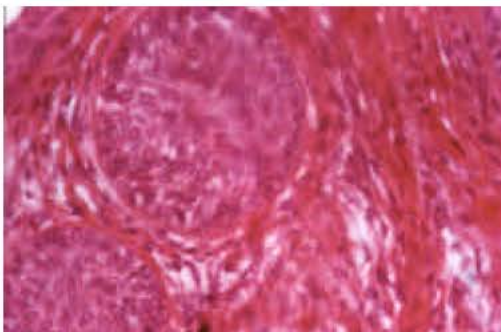


Fig. 3: Two clusters of pleomorphic neoplastic cells with hyperchromatic nuclei (H and E, $\times 528$)

In mesothelioma, either the mesothelial covering cells or the supporting tissues can be the predominant component, so the neoplasm can appear microscopically as carcinoma or as a fibrosarcoma (Lopez, 2001). In this study, the predominant component was proliferation of visceral pleural mesothelial cells in different patterns.

The microscopic findings of this case was closely resemble to previous description of mesothelioma in a dog (Smith and Hill, 1989). In the current study, neoplastic mesothelial cells arranged as cysts or acini in some regions. Wilson and Dungwoth (2002) have described invaginations of mesothelial growths can give an acinar appearance resembling adenocarcinoma. Cystic peritoneal mesothelioma has been reported in a dog (Dipinto *et al.*, 1995).

In this case, the formation of dense collagenous connective tissue (scirrhous response or desmoplastic reaction) was seen too. More aggressive mesotheliomas elicit a marked scirrhous response that may isolate islands of neoplastic mesothelial cells aggregates (Wilson and Dungwoth, 2002).

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