

**An Abattoir Study of Thyroid Histopathology in Ewes and their Fetus in
Ahvaz City of Iran**

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Abstract

The thyroid structural changes in pregnant ewes and their fetuses were investigated. Out of 100 pairs of thyroid glands collected from ewes and their fetuses at the local municipal abattoir in Ahvaz city of Khuzestan province, multiple lesions were seen in 59% and 21% of the thyroid glands of ewes and fetuses, respectively. Histologically, ninety nine lesions in the ewes and twenty two lesions in the fetuses' thyroid glands were noticed.

Keywords: Ewes, Fetus, Thyroid, Pathology

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There is no published information on the pathology of simultaneous maternal and fetal thyroid glands in sheep. An abattoir study has reported that 6.54% of goats and 2.80% of sheep had pathological lesions in their thyroid.¹ In our previous study we reported 41% of sheep slaughtered at slaughter house had different lesions in their thyroids which had affected function of the glands.² This high incidence of thyroid pathological changes among sheep in the area prompted us to look at the frequency of these lesions in the fetal life. This short communication gives the prevalence and a detailed description of thyroid pathological changes in ewes and their fetuses slaughtered in Ahvaz abattoir. Ahvaz is the center of Khuzestan province in the southern Iran, 800 km to Tehran, the capital. Ahvaz is the hottest city in Iran and its temperature reaches above 50 °C in summer. The sheep in the area were at all times subjected to the outdoor environment temperature and exposed to solar radiation throughout the day during grazing. Over a period of 12 months from March 2006 to February 2007, thyroid samples were taken from 100 pregnant ewes and their fetuses slaughtered at the local abattoir. The thyroid glands were dissected free of fat, fixed in 10% buffered formalin, and embedded in paraffin wax. Tissue sections were cut at 5 µm thickness, stained with hematoxylen and eosin for histopathological examination. Of 100 pairs of thyroid glands, lesions were seen in 59% and 21% of pregnant ewes and their fetuses, respectively.

Light microscopy sections show wide variety of pathological changes in the thyroid glands of ewes and their fetuses. Histopathological changes for ewes were categorized as follicular hyperplasia (37%) (Fig.1), branchial cyst (31%) (Fig.2), ultimobronchial cysts (14%) (Fig.3), hyperemia and hemorrhagia (10%) (Fig.4), follicular necrosis (4%) (Fig.5), Trabecular adenoma (1%) (Fig.6), lymphocytic thyroiditis (1%) (Fig.7), and thyroiditis (1%) (Fig.8).

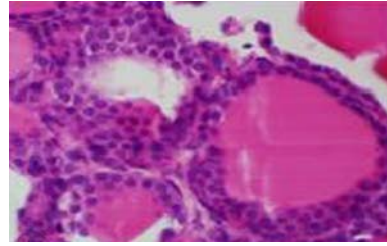


Fig 1. Follicular hyperplasia showing numerous follicular cells of layer parenchyma (H&E, 40×).

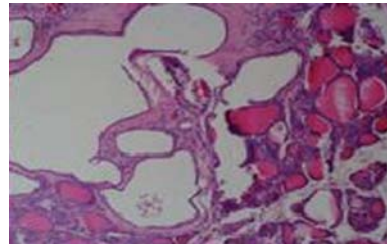


Fig 2. Branchial cysts. The inner linings are ciliated pseudo stratified columnar epithelium without smooth muscle or a cartilaginous component (H&E, 10×).

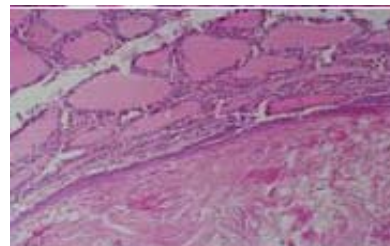


Fig 3. Ultimobronchial cyst. Stratified squamous epithelial cells of lumen and keratinized material (H&E, 10×).

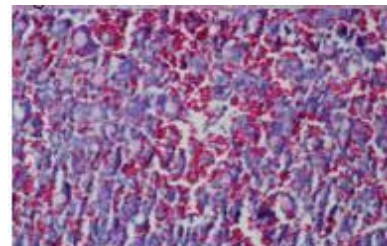


Fig 4. Hyperemia and bleeding between follicles (H&E, 10×).

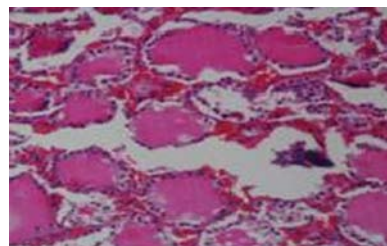


Fig 5. Follicular necrosis. The nuclei of follicular cells showing picnosis and displaying eosinophilic cytoplasm (H&E, 10×).

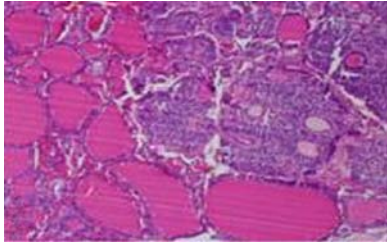


Fig 6. Trabecular adenoma. There are thin fibrovascular septae between the adenoma tissues arranged in a trabecular pattern (H&E, 40×).

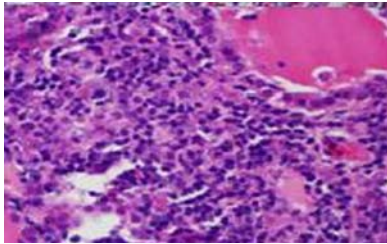


Fig 7. Lymphocytic thyroiditis shows lymphocyte infiltration (H&E, 40×).

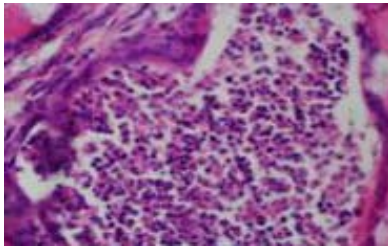


Fig 8. Thyroiditis. Photomicrograph demonstrates lymphocyte and neutrophil infiltration within the thyroid parenchyma (H&E, 4×).

In the fetuses thyroid glands structural changes were: brachial cyst (7%) (Fig.9), hyperemia and hemorrhagia (12%) (Fig.10), and adenoma (2%) (Fig.11).

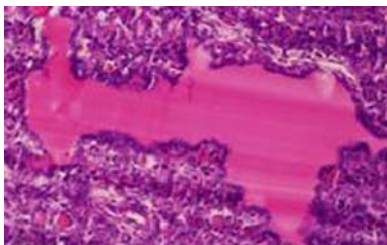


Fig 9. Branchial cyst in fetus. Showing an enlarged cavity filled with eosinophilic colloidal fluid. The wall of the cyst lined with simple cuboidal epithelial cells (H&E, 4×).

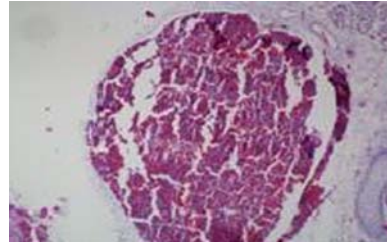


Fig 10. Hyperemia and hemorrhage in fetus. Showing vascular hyperemia and hemorrhage between follicles (H&E, 4×).

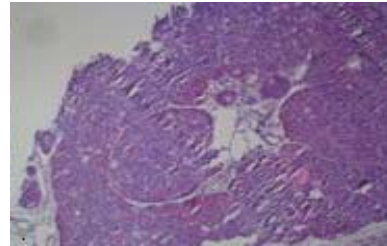


Fig 11. Microfollicular adenoma in fetus. The section shows a nodule of cellular thyroid tissue which surrounded with connective tissue (H&E, 4×).

All the fetuses with the thyroid lesions their mothers had also lesions in their thyroids, but not all the ewes with thyroid lesions their fetuses had lesions in their thyroids. In one case the mother and her fetus both had adenoma in their thyroids. The results of this study showed that a high percentage of the fetuses had some lesions in their thyroids. There seems to be some factors simultaneously induce pathological changes in the thyroid glands of mothers and their fetuses. It is well known that among environmental factors two are more importantly affect the thyroid glands: ambient temperature and feed intake.³⁻⁵ High temperature and decreased feed intake have been shown to decline thyroid hormones via various mechanisms.^{6,7} Notably it has been proposed that temperature plays a dual role: its direct effect on TRH, and subsequently plasma T4⁸ and indirect effect on decreasing appetite which on its own can decrease thyroid hormone blood level. The effect of high ambient temperature on structural changes of the thyroid gland has not been investigated. It has been observed that hyperthermia in late gestation of pregnant ewes can induce

structural changes in the fetus's thyroid glands.⁹ Mild heat stress (rectal temperature up to 40.4 °C) caused significant changes of fetal thyroid morphology. It is concluded that fetal thyroid gland in sheep is responsive to environmental temperature changes, and such changes may contribute to a decrease rate of fetal growth and maturation.⁹ In the present study most of the fetuses with thyroid lesions spent their fetal life in the summer. Since all ewes were on the same diets and pastures therefore, ambient temperature could be an important factor in the thyroid structural changes observed in this research. One interesting case in this study was thyroid adenoma in a ewe and her fetus. It was shown that the exposure to 5 µc. iodine-131 daily for life time could induce adenoma or fibrosarcoma in a group of sheep.^{10,11} The exact cause of adenoma in the ewe and her fetus in the present study was not clear. The results of this research revealed that thyroid lesions are very high among sheep in the area and they may have inherited them from their dams, but at what extent these lesions can interfere with normal function of the gland is remained to be investigated by measurement of thyroid hormones in both ewes and their fetuses.

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