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SOME PATHOLOGICAL CHANGES IN THE THYROID OF DOG (With 5 Figures)

By

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بعض التغيرات الباثولوجية في الغدة الدرقية للكلاب

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اجرى البحث على عدد ٥٠ كلب ضال بمحافظة أسيوط . ولقد تم دراسة التغيرات الباثولوجية الدرقية واتضح أن التغيرات كانت عبارة عن التهاب ليفغوى للغدة وبعض الاصابات بالجربتر وكذلك ضمور حويصلات الغدة واحلالها بالنسيج الضام.

SUMMARY

Fifty thyroid glands were collected from stray dogs presented to the department of Vet. Pathology Faculty of Vet. Med. Assiut for post mortem examination. The pathological findings recorded were in the form of lymphocytic thyroiditis, fibrosis and colloidal goiter. In addition, the effect of hypothyroidism on the liver and kidney was also discussed.

INTRODUCTION

The thyroid gland play major role in the control of various metabolic process and have their definite action on the normal sexual pattern of man and animals, YASHWANT and SHARMA (1974). Hypothyroidism is an important disease of dogs and is most often caused by primary diseases of the thyroid gland. In the past idiopathic follicular atrophy was considered to be the most common condition affecting the gland BUSH (1979) and although a non functional lymphocytic thyroiditis has been recognized for some years in colonies of laboratory beagles, TUCKER (1962), MAWDESLEY and JOLLY (1967) BEIRWALTES and NISHIYAMA (1968) MUSSER and GERHAM (1968), FRITZ *et al.* (1970). Lymphocytic thyroiditis was recognized recently as an important cause of hypothyroidism in pet dogs GOESSELIN *et al.* (1980, 1981). Thyroglobulin autoantibodies have been demonstrated in 12 from 25 dogs had hypothyroidism, GOESSELIN *et al.* (1980).

This paper report the histopathological findings in the thyroid glands of fifty dogs presented to the Dept. of Vet. Pathology Faculty of Vet. Med. Assiut during the period 1986 to 1987 in addition the effect of hypothyroidism on the extrathyroidal organs was also discussed.

MATERIALS AND METHODS

Fifty thyroid glands were collected from stray dogs presented to the department of Vet. Path. Faculty of Vet. Med. Assiut. The animals were killed by electric current shock and dissected immediately. In addition to the thyroid glands liver, Assiut Vet. Med. J. Vol. 21, No. 42, 1989.

kidney, and heart were taken fixed in neutral buffer formalin solution and processed for paraffin embedding. Sections of 6 micron thickness were stained with H & E, Van Gieson and P.A.S. stains and examined.

RESULTS

Clinical examination of the dogs revealed alopecia particularly of dorsal surface of distal aspect of the tail, dry scaly skin in 8 dogs. 12 dogs showed bleaching of the normal colour and thickening of the skin.

Macroscopic findings :

The thyroid glands of 8 dogs were moderately increased in size. The enlargement is usually uniform. The surface is slightly nodular and covered by thin fibrous capsule. On cut section, the substance is firm grey in colour and lobulated. The thyroid glands of ten dogs were greatly enlarged, the surface is smooth and covered by slightly thickened fibrous capsule, the consistence is firm. The thyroid glands of two dogs were smaller in size, hard in consistency. Cut section showed greyish white spots in the centre, the kidneys and liver of 20 dogs with thyroid abnormalities were enlarged, pale in colour and have a greasy cut surface.

Microscopic pathology :

The pathological changes seen in the thyroid glands of 8 dogs were similar but varied in intensity. They revealed the picture of lymphocytic thyroiditis. The later was represented in diffuse or focal infiltration of the interfollicular tissue by lymphocytes, plasma cells and macrophages leading to destruction and replacement of many follicle Fig. (1). In 4 dogs few normal thyroid follicles remains. Many follicles were small and were lined by large cuboidal cells with vesicular nuclei and granular eosinophilic cytoplasm. Some of these follicles showed evidence of hypertrophy with abundant cytoplasm, while others revealed degenerative changes. In most severely affected gland most of the large follicular cells were arranged in small islets with no apparent lumen. The cells showed frequent mitotic figures. Thyroid C cells appears normal and only increased than usual. Where colloid was present it was either densely eosinophilic or scanty vacuolated and frequently contained plasma cells, lymphocytes and macrophage.

Ten dogs revealed the picture of colloidal goiter. The acini were distended, filled with colloid Fig. (2), the follicular walls were stretched with flattened epithelium. This was very clear in the periphery located large follicle. The capillaries are distended with blood. Evidence of hyperplastic changes in other follicles were seen.

The thyroid glands of two dogs showed small focal areas of fibrosis, not infrequently the fibrous tissue in these areas was partially or completely hyalinized Figs. (3 & 4). The thyroid follicles adjacent to the area of fibrosis were atrophied.

Microscopic examination of the kidneys of these affected animals revealed characteristic lesions in the small blood vessels, glomeruli and tubules. Some of the small blood vessels were blocked with homogenous acidophilic stained mass

PATH. OF THYROID IN DOG

of blood plasma which were studied by abundant amount of fat globules. Some of the glomeruli were atrophied and in others the glomerular tuft were completely disappeared and replaced by a homogenous acidophilic mass filling the Bowman's space which showed some fat globules. These were prominent in dogs with thyroiditis. The epithelium lining of the convoluted tubule showed fatty changes.

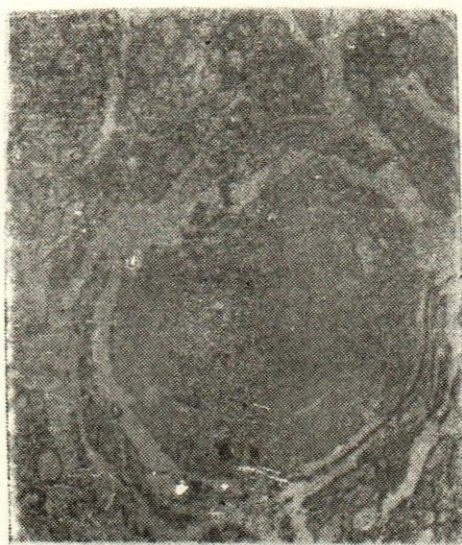
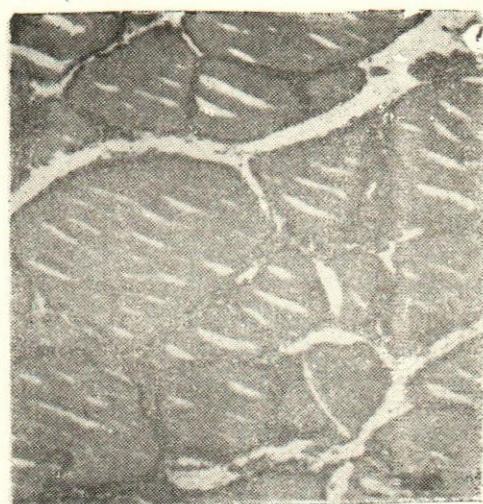
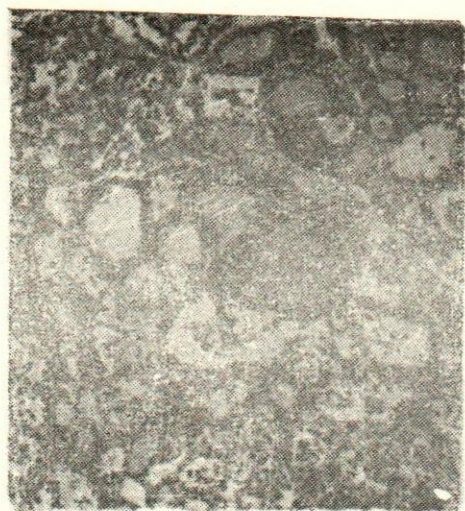
Examination of the liver revealed the presence of focal or diffuse areas of fatty infiltration of all cases showing thyroid changes, Fig. (5). The most severely affected cells are those localised around the central veins.

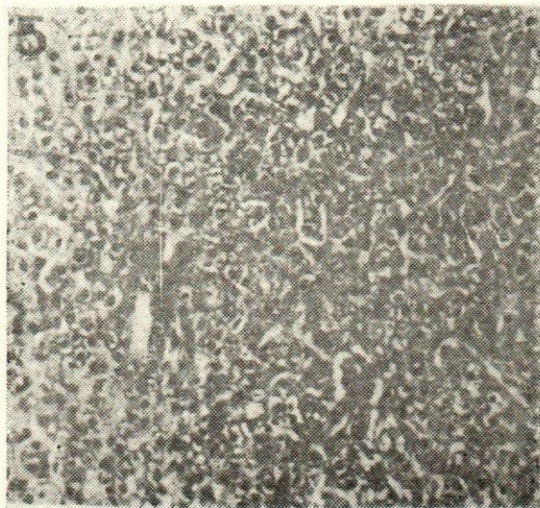
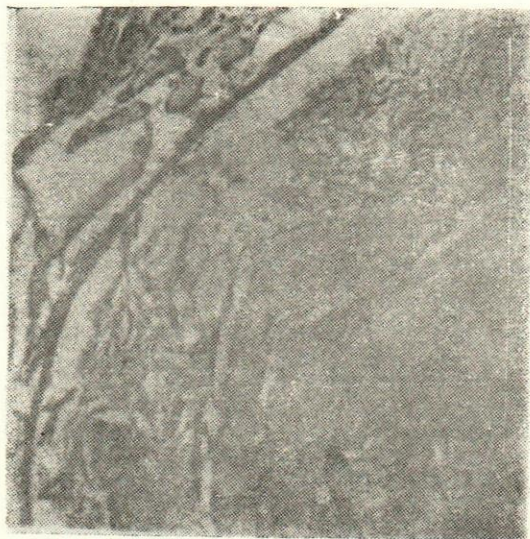
DISCUSSION

In the present study. The pathology of the thyroid glands of dogs can be classified into, 8 dogs showing the picture of lymphocytic thyroiditis, 10 dogs revealed colloidal goiter and 2 dogs manifested fibrosis with atrophy of the thyroid follicles.

Lymphocytic thyroiditis has been recently reported as a cause of hypothyroidism in 7 dogs GOSELIN et al. (1980, 1981). They demonstrated circulating thyroglobulin antibodies in 12 of 25 pet dogs and, although we were not able to carryout such measurement, the histological findings in the thyroids examined from our dogs were very closely resemble those described by GOSELIN et al. (1980). The condition is characterized by diffuse infiltration of the thyroid glands by lymphocytes, plasma cells and macrophages, with destruction of the thyroid follicles. On the other hand the lymphocytic thyroiditis described in the present work differ from that described by FRITZ et al. (1970) in laboratory beagle colony in it's severity. In the beagle the inflammation tend to be focal rather than diffuse, the lesion, does not appear to progress and it seldom cause any significant thyroid dysfunction. GOSELIN (1981) divided their series of 16 dogs with clinical hypothyroidism into 2 distinct pathological entities on the basis of histological examination of thyroid glands, those with lymphocytic thyroiditis and those with idiopathic follicular atrophy. In the present study we have not identified a case of follicular atrophy that fits their description of the disease. It is not apparent from their report whether there is any difference in breed prevalence of 2 pathological condition which may account for the present work not having seen an example of idiopathic follicular atrophy. In this paper local areas of fibrosis were observed in the thyroid glands of 2 dogs. These may represent a progressive end stage of a case of lymphocytic thyroiditis. In the present work 10 dogs revealed the picture of colloidal goiter with enlargement and distention of the acini which are filled with colloid and the epithelium was flattened. The pathogenesis of colloidal goiter is a matter of speculation it is known that deficiency of iodine resulted in follicular hyperplasia. FOLLIS (1959) stated that the colloidal goiter represent an involutinal stage of hyperplastic goiter.

In this study we can concluded that the pathological changes observed in thyroid glands of 50 examined in the Dept. of Vet. Pathology Assiut represented in the form of lymphocytic thyroiditis, fibrosis and colloidal goiter. These causes hypothyroidism which is manifested by the clinical, pathological findings in the thyroid glands and also by liver and kidney lesions. It is known that in hypothyroidism decreased rate of lipid metabolism with diminished intestinal excretion of cholesterol





PATH. OF THYROID IN DOG

and conversion of lipids into bile acids and other compounds occurs, JUBB and KENNEDY (1985). So the pathological alteration in the liver and kidney may be due to hyperlipidemia and hypercholesterolemia which occur in case of hypothyroidism. Since in man and dogs with autoimmune thyroiditis have an increased risk of developing other autoimmune diseases then an awareness of thyroid pathology would seem important.

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LEGENDS OF FIGURES

- Fig. (1):** Diffuse infiltration of thyroid follicles by lymphocytes, plasma cells and macrophage (H & E, 10 x 10 x).
- Fig. (2):** The acini are distended by colloid with flattened epithelium (H & E, 10 x 10 x).
- Fig. (3):** Focal area of fibrosis replacing the thyroid follicles (H & E, 10 x 4 x).
- Fig. (4):** Focal area of fibrosis (H & E, 10 x 16 x).
- Fig. (5):** Liver showing fatty infiltration (H & E, 10 x 10 x).