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SOME TOPOGRAPHICAL AND HISTOARCHITECTURAL STUDY OF PARATHYROID GLAND OF LAYING HENS

N.S,AL-Samarrae A.J.,Al-Samarrae and F.O.,Rabie.

Department of Veterinary Anatomy, Histology and Embryology, College of Veterinary Medicine, University of Baghdad. Baghdad, Iraq.

SUMMARY

Grossly, there are bilaterally paired, round to oval parathyroid glands in laying hens. The glands are situated, intrathoracic, near the caudal pole of thyroid gland or beneath the division of brachiocephalic arteries. They recieve blood by short branches from common carotid or from oesophageal artery. Histologically, the glands were composed of distinct nests or cords of chief cells but there were no oxyphils as in the parathroid of some mammals.

INTRODUCTION

Anatomical and histoarchitectural studies are basic aims for understanding the normal function of an organ or structure. Although some studies have been made on the structure of parathyroid glands in many mammlian species such as Camel (1), Cow(2), Deer(3), and Rabbit(4). There are scarce studies on parathyroid glands in laying hens. The objective of this investigation is to reveal the anatomical and histological feactures of these glands.

MATERIALS AND METHODS

Clinically healthy 30 laying hens (Gallus domesticus), were used in this study. The laying hens were kept under constant temperature (20 °C). They were fed on commercial laying hens diet.

The gross anatomical features of parathyroid glands from 20 laying hens were verified. Paraffin tissue blocks were made and five micron (thickness) sections were prepared, mounted and stained either with hematoxylin and eosin or with Van Gieson (5). Injection of Latex,in the common carotid artery, was applied in ten laying hens to study the blood supply of the glands.

RESULTS

The bilaterally paired parathyroid gland appeared rubbery in consistance and light in colour. They were intrathoracic in position, attached or close to the posterior pole of thyroid gland. (Fig. 1). Sometimes They occure as two separate glands more commonly on the left than on the right side where as in some cases, these glands are situated beneath the division of brachiocephalic artery (Fig 2). On each side, the paired parathyroids are closely apposed and form a single round to oval lightcoloured structure. The arterial blood is supplied by short branches from the common carotid artery, but when the parathyroid is attached to caudal pole of the thyroid ,it received short branches from oesophageal artery.

Histologically, the parathyroid gland has a connective tissue capsule (Fig. 3). It's parenchyma is composed of cords or clusters of cells (Fig.4) with thin septa of connective tissues containing blood capillaries and nerve elements. One parenchymal cell type can be distinguished, these are the principal or chief cells. These cells are numerous and are polygonal, oval or elongated in shape. The nuclei are slightly oval or round contain condensed chromatin granules in the form of dark clumps, and have one or more deeply staind nucleoli. The chief cells have small amount of cytoplasm. The boundries between cells

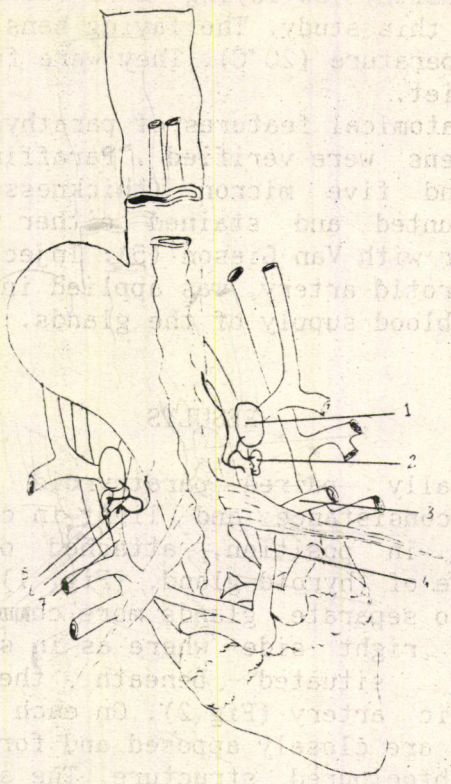

Fig.1: Topography and blood supply of the parathyroid glands of laying hens.

1- Thyroid gland
2- Parathyroid gland which is attached to or near the posterior pole of the thyroid gland,
3- Subclavian artery,
4- Brachiocephalic artery,
5- Branches from esophageal artery,
6- Esophageal artery originating from common carotid artery,
7- Common Carotid artery.

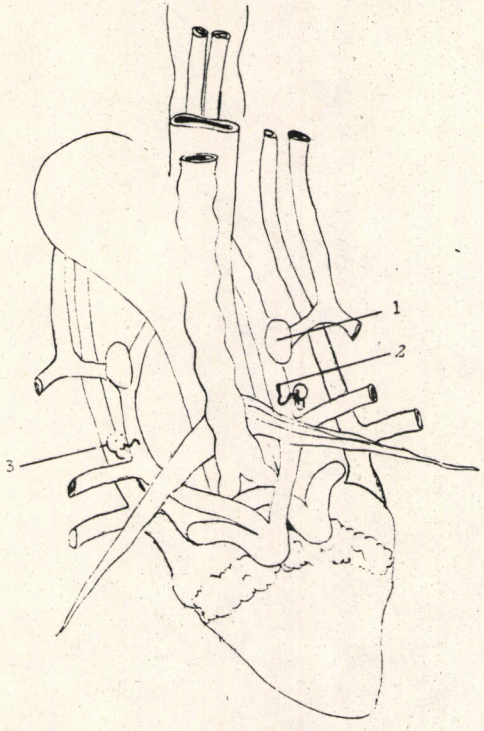

Fig.2: Topography and blood supply of parathyroid gland.

1- Thyroid gland.
2- Branches from ventral surface of common carotid artery,
3- Parathyroid gland is situated beneath the division of the brachiocephalic artery.

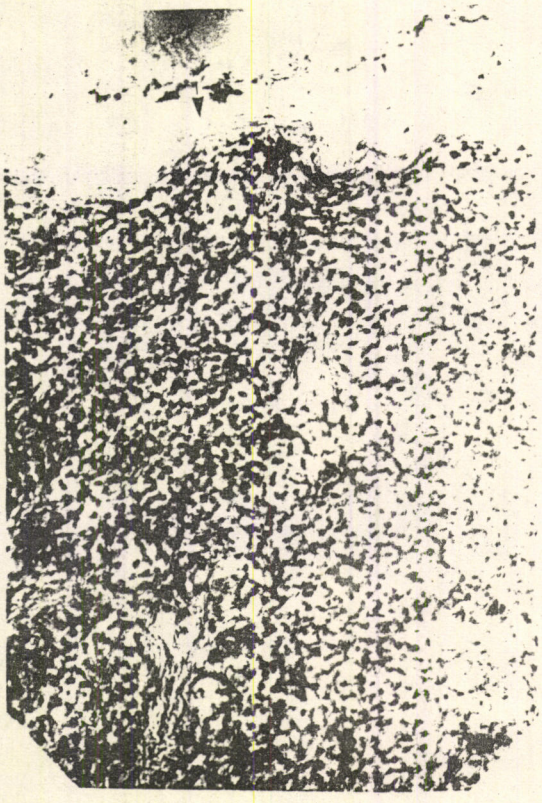

Fig.3: H & E stained Five um thick section of the parathyroid gland. The paranchyma of the gland is surrounded by a connective tissue capsule (arrow) from which septa descend (X 250).

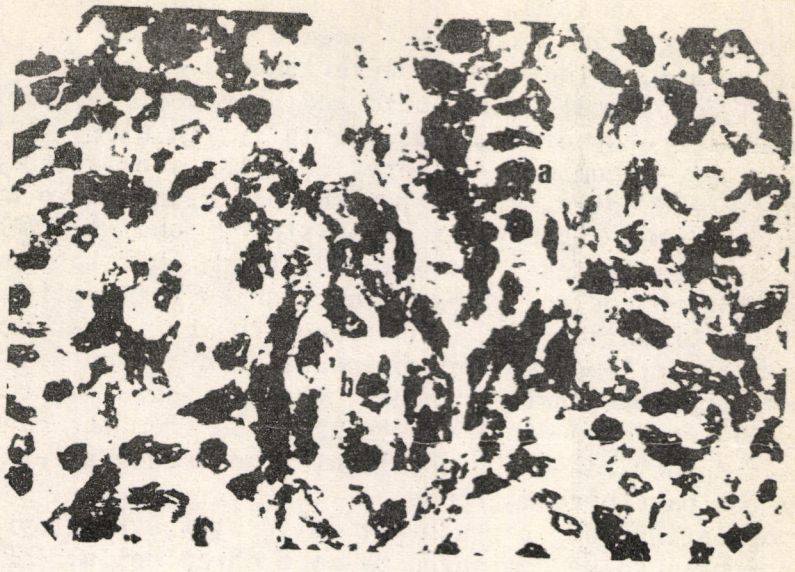

Fig.4: Parenchymal cells of parathyroid glands. a cord, of chief cells b) clusters of chief cells. Van Giesen (X1250).

are evident in some areas . Neither oxyphil cells nor transitional cells are present in parathyroid glands of laying hens. The elongated nuclei that can be seen between the parenchymal cells belong either to connective tissue cells or capillary endothelium.

DISCUSSION

The parathyroid glands of hens were easily dissected and grossly distinguishable from surrounding masses of fat. The glands occured as four round bodies which form two lateral glands. These findings are similar to those reported by Venzke (6). Mcleod et al (7) Richard et al (8)where as Nickel et al claimed that due to mode of development it was possible to differentiate 3-5

parathyroid glands. Our findings showed that some of the parathyroid glands situated beneath division of the brachiocephalic arteries to subclavian and common carotid arteries. Copp et al (10), Gould and Hodges (11) reported that the parathyroid glands normally lie close to the division of innominate artery into the subclavian and common carotid arteries. The parathyroid glands have been shown to be rubbery in consistency and light in colour(7), but Nickel et al (9) found that they were irregular spheres and their colour varies from yellowish brown to brownish-red . The blood to the parathyroid glands is supplied by short branches from common carotid artery , or by short branches from oesogeal artery. Venzke(6) reported that minute arteries from the caudal thyroid artery and the syringotracheobronchial artery supply the parathyroid glands.

The population of parenchymal cells of the parathyroid glands appear to be dominated by more chief cells, (12). Oxyphil cells or transitional forms of either cell type were not observed in avian parathyroid glands, but there were round cells resembling fibrocytes or endothelial cells arranged in irregular cords of cells (13).

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دراسة بعض طوبوغرافية ومنظومة نسج الغدة جنب الدرقية في الدجاج البياض

نعمان سلمان مهدي السامرائي ، عبد الجبار جميل السامرائي
فرحان عودة ربيع

فرع التشريح، كلية الطب البيطري

الخلاصة

عيانيا يوجد زوج دائري اوبيض من الغدد جنب الدرقية في الدجاج البياض . يقع كل زوج وحشيا داخل الصدر قرب القطب الخلفي للغدة الدرقية او اسفل تفرع الشرايين العضدية الدماغية . تستلم الغدة مددها الدموي من فروع قصيرة للشريان السباتي العام او من فروع صغيرة للشريان المريئي. نسيجيا يتكون متن الغدة من خلايا رئيسة فقط تشكل اعشاش او حبال اضافة لخلايا النسيج الضام وخلايا بطانية . لاتوجد خلايا حمضية كما معروف في غدد جنب الدرقية لبعض اللبائن.